CRITICAL APPRAISAL TO CLINICAL RECOMMENDATION:
Implementing Evidence Based Practice Skills into Athletic Training Practice

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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
2. Theroux R. How to bring evidence into your practice. AWNN Lifelines. 2006;10(3):244-249.
4. Centre for Evidence Based Medicine: http://www.cebm.net/
5. Enhancing the QUAlity and Transparency Of health Research: http://www.equator-network.org/

EBP Across the Curriculum
First Semester
- 6 weeks: Introduction to EBP Principles
  - Sensitivity, specificity, odds ratios, prevalence, prediction values
  - AT 462/562: Interventions I
- Critically Appraised Topic
  - Abstract Submission to District Meeting
  - AT 474/574: Interventions III
- Grand Rounds
  - AT 443/543: AT Techniques III

Second Semester
- 2 Critically Appraised Papers
  - AT 484/584: 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

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

### Critical Appraisal...

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

**Critical Appraisal to Clinical Hermanesiation:**
- Reading Scientific Literature Value-Set (Cohort Study)

**Additional Questions for Case Report**

**Methods:**
- **Sample**
  - Patient Information
  - Was a control used?
  - Is demographic information provided?
  - Are main symptoms/chief complaints described?
  - Medical, family, psychosocial history described?
  - Relevant past interventions and their outcomes?

**Methodology:**
- **Clinical Findings**
  - Are relevant physical findings described?

**Methodology:**
- **Timeline**
  - Was a timeline clearly provided with milestones?

**Methodology:**
- **Diagnostic Assessment**
  - Were diagnostic methods described?
  - Were any diagnostic challenges described?
  - Was Dx reasoning included/other diagnosis considered?

**Methodology:**
- **Therapeutic Intervention**
  - Was the type of intervention(s) described?
  - Administration (dosage, strength, duration)
  - Changes in intervention with rationale?

**Results/Outcomes**
- Clinician assessed outcomes/patient assessed outcomes?
- Important follow-up test results?
- Intervention adherence and tolerability?
- Adverse and unanticipated events?

### Literature Project

**PART 2: NOT ALL RESEARCH IS EQUAL**

- **Read and Evaluate the article using the guidelines below:**

  **Directions:**
  - Using either the basic evaluation strategy, evaluate the article you have located.
  - Additional in-depth review using the STRIVE Statement is included for the methods and results section.
  - 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 authors (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/thesis? Is the purpose and aims clearly stated? Is the purpose of the study clearly relevant?

  **Read the body of the article:**
  - Methods: How, where and when?

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

<table>
<thead>
<tr>
<th>Study design</th>
<th>Are the findings of this study that address the research question described?</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>Are the periods of recruitment, exposure, follow-up, and data collection</td>
<td>N</td>
</tr>
<tr>
<td>Participants</td>
<td>Are the inclusion and exclusion criteria described? Are methods of follow-up described?</td>
<td>N</td>
</tr>
<tr>
<td>Variables</td>
<td>Are the study participants adequately described? Are methods of follow-up described?</td>
<td>N</td>
</tr>
<tr>
<td>Data sources/measurement</td>
<td>Are the study participants adequately described? Are methods of follow-up described?</td>
<td>N</td>
</tr>
<tr>
<td>Bias</td>
<td>Are efforts to address potential sources of bias described?</td>
<td>N</td>
</tr>
<tr>
<td>Study site</td>
<td>Is there a description of how the study site was selected?</td>
<td>N</td>
</tr>
<tr>
<td>Quantitative variables</td>
<td>Are the quantitative variables handled in the analysis if applicable, or a description of how quantifying variables was handled?</td>
<td>N</td>
</tr>
<tr>
<td>Statistical methods</td>
<td>Are all statistical methods included, including those used to control for confounding?</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Are any methods used to examine subgroups and interactions described?</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Is there an explanation of how missing data were handled?</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Is there a description of any sensitivity analyses?</td>
<td>N</td>
</tr>
</tbody>
</table>

### Additional Discussion on RESULTS adapted from the STRIDE Statement (Observational Studies)

| Sample demographics | Are there data on the sample, including potential study participants described? | N |
| Descriptive data    | Are the characteristics of the study population, including demographic and other data, presented? | N |
| Statistical analysis | Are there data on the statistical analysis presented? | N |
| When results         | Are there a description of the statistical analyses or results? | N |
| Other                | Are there any other aspects of the paper that should be discussed? | N |
Quality and Levels of Evidence...

- 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

Synthesize what you read:

Write out the clinical findings you think are important from this article as they relate to the clinical question. (reflect 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)

Levels of Evidence...

- Centre for Evidence Based Medicine (CEBM)
  - Oxford University

Clinical Bottom Line...

- 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?
So what do I do now...

- 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!!!!!