IN RECENT YEARS, evidence-based medicine (EBM) has become an increasingly important concept for guidance of clinical practice in health and medicine. This approach to clinical practice involves not only the best current research evidence, but also incorporates the clinician’s individual expertise, and, most importantly, the patient’s personal values and goals. Because current technology allows the modern patient to effortlessly access health care and medical information, it is critical for health care professionals to remain up to date with research. The demand for clinicians to be conscious of the most efficient way to access this research is becoming a necessity. Most research evidence can be found by searching databases and journals; unfortunately, some publications do not necessarily ensure the quality of a study. Therefore, critical appraisal is a fundamental skill for clinicians whose practice is guided by EBM principles.

The purpose of critically appraising research is to determine whether or not the results should be translated and applied to clinical practice. The clinician should be able to answer three general questions for each study that is analyzed. First, are the results of the study reliable and can they be reproduced if the same study was conducted again? Second, are the results of the study valid? More specifically, did the results fulfill what the researcher was initially attempting to accomplish? And finally, are the findings of the study clinically relevant to the particular clinical question? It is also important for a clinician to not only be able to identify the positive aspects of a study, but the negative ones as well. Because no study is perfect, being able to identify flaws, limitations, and threats to validity will aid the clinician in making a thorough clinical decision.

Clinicians are faced with important dilemmas daily—what is the safest and most effective intervention for a patient? How does one treat a specific population or injury? These are only two of many common and important questions that clinicians pose in regard to their practice. In order to provide optimal patient care, clinicians often base treatment decisions on current research that is supported by peer-reviewed studies. The most effective way for a clinician to make an evidence-based decision is to begin a literature search for a clinical question; however, due to the demanding schedule of most athletic trainers, it is difficult to delegate time to explore current research. Therefore, the use of critically appraised papers and topics...
are a convenient tool for health care professionals to access up to date research.\(^3\)\(^4\)

**Writing a Critically Appraised Paper**

A Critically Appraised Paper (CAP) is a 1-page analysis or research report published in a peer-reviewed medical journal.\(^5\) The CAP format is standardized to include a clinical question and a clinical bottom line. The latter reports the reviewer’s recommendation for clinical application based on the significance of the study results. Additionally, a summary of the methods, results, and validity of the study is included within the CAP.

The first step in writing a CAP is to develop a specific clinical question to determine how to best treat a particular injury or patient case. Typically, a well-constructed clinical question identifies four main components; these elements are often referred to as PICO, which identifies the population or patient problem (P), intervention or area of interest (I), comparison intervention or group (C), and lastly the outcomes (O).\(^1\)\(^2\) The PICO format will allow the clinician to develop a well-written question that is specific and direct and will allow him or her to easily proceed to the next step of the EBM process—a literature search. Although developing the clinical question may be the most crucial of the five steps to evidence-based medicine, searching for accurate literature and narrowing it down to a manageable amount of information is often the most time intensive.\(^6\) This literature search, however, is what provides the clinicians with a peer-reviewed journal article relevant to the question at hand.

Internal validity is directly affected by the strengths and weaknesses of a study’s design. The validity section of a CAP illustrates whether the research design was largely responsible for producing change in a patient population or if change was due to extraneous factors. External validity relates to the applicability of research findings to a real-world setting and shows whether or not the study’s design and results can be clinically applicable in circumstances involving other people, places, and times. The reader, then, is allowed to determine whether or not the results of the study can be reproduced in his or her clinical setting. The final portion of this section identifies the statistical aspects of the study being examined, which may intimidate those readers who are less familiar with statistical terms and analyses. The beauty of a CAP is that, unlike reading and interpreting a full research article, the author of a CAP has already deciphered these results for the reader.

Once a complete analysis of the research article has been conducted—including a summary of key evidence describing the study design, participants, procedures, outcome measures, and, finally, the results—a clinical bottom line can be composed. The clinical bottom line generally reports the main findings from the research article’s critical appraisal. Next, the CAP is completed with a statement relating the study being analyzed to the clinical question. This assertion may further identify how limitations of the study influenced the CAP author’s clinical bottom line. Lastly, before writing a full citation for the article evaluated in the CAP, a level of evidence is assigned to the research study.

**Ranking Evidence for the CAP**

The most commonly used method for ranking evidence is the Oxford Centre for Evidence-Based Medicine (CEBM) levels of evidence scale.\(^7\) This method utilizes a five-level ranking system and categorizes evidence based on the quality of the study design.\(^8\) The lowest level, a level 5, of the CEBM scale consists of research information from expert opinion, anecdotal evidence, bench research, animal research, and unpublished clinical observation.\(^8\) Progressing upward, each level of evidence ensures a higher level of research quality than the last. The top two levels of the CEBM scale are then divided into three subcategories. The three divisions of level two encompass cohort studies, while a level one study, the highest level of evidence, consists of randomized controlled trials. Each type of research study a clinician may encounter during a literature search can be classified in one of the CEBM’s levels of evidence, which will guide the individual to determine the value of the reported results.\(^8\)

By reviewing a critically appraised paper, a clinician is able to quickly determine whether the results of a specific study are applicable to his or her clinical question. Similar to a CAP is a critically appraised topic, otherwise known as a CAT. Although both the CAP and CAT are parallel instruments for the critical appraisal of research evidence, there are a few distinguishing factors. Whereas a critically appraised paper analyzes only one individual research study, a critically appraised topic is a synthesis of numerous studies (no fewer than three) reviewing the same general topic of
interest.\(^9\) CATs typically include tables and charts that identify specific information from each study being critically appraised. Unlike critically appraised papers, the clinical bottom line of a CAT should be more definitive since conclusions are drawn from multiple studies rather than only one.

**Conclusion**

With the rapid evolution of evidence-based medicine throughout health care, effective strategies to implement evidence-based practice must be pursued. Critically appraised papers and topics are an effective means of facilitating EBM integration into sports medicine. By considering a CAP or CAT, a clinician is able to quickly determine whether the results of a specific study are applicable to his or her clinical question. If the CAP or CAT is applicable to a specific case, the clinician is able to easily, efficiently, and safely reproduce the intervention described by the research for the patient in practice.\(^4,10\) Thus, critically appraised papers and topics provide a method for the sports medicine clinician to include current evidence into clinical practice without the hassle of conducting exhaustive literature searches and reading numerous and lengthy journal articles.

**References**


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