How Many Lives Does a CAT Really Have?

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Critically Appraised Topics (CATs) are one of the most important sources of evidence that *IJATT* publishes. Since introducing CATs to *IJATT* 4 years ago,¹ 25 have been published in *IJATT* on a variety of topics. CATs have implications for education, clinical practice, and future research. Our goal for these manuscripts is to provide readers a consumable critique of sports medicine research that can be readily incorporated into clinical practice.

In the late 20th century, CATs began their life as brief reviews and critiques of the literature, developed by and shared with colleagues to foster discussion of the best patient-oriented evidence for answering clinical questions. A CAT was originally limited to 1 page, which outlined a question in the PICO (patient/population, intervention, control/comparison, outcome) format, highlighted the search strategy, evaluated the quality and consistency of the evidence selected, and synthesized the answer into a clinical bottom line. In this way, the CAT represented the mechanism for closing the gap between the available external evidence and clinical practice.² This process had implications for clinical practice, education, and research.

Since their inception, CATs have taken on a more formal manuscript format in many journals, including *IJATT*. They also have important lives in education, clinical practice, and in research. As short, focused appraisals of the literature, it is critically important to remember that CATs have a shelf life of approximately 2 years. The first aim of this editorial is to explain a model we have developed to assist clinicians, researchers, educators, and students to appreciate the short, yet impactful lives that CATs lead. A CAT is a living document that has many lives and can be reincarnated into many different forms (Figure 1). In this editorial, we will explore the question: “How many lives does a CAT really have?”

A CAT's Life in Education

Within the domain of education, CATs can be used to help students appreciate the process of constructing a clinical question, selecting the evidence, evaluating the quality and consistency of evidence, and forming the final synthesis and recommendation. Working through this helps students, and instructors, appreciate the critical appraisal process. Because CATs are less stringent than systematic reviews, they are not as overwhelming or intimidating. Even so, CATs are excellent educational tools through the lives that they live.

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A first educational “life” for a CAT is to help students *appreciate* the process of answering clinical questions that they might have by going through the process of external evidence synthesis. A second logical educational “life” for a CAT is *replication* of the original clinical question. With that relatively short shelf life, replicating a question, search strategy, and evidence appraisal to see if any new external evidence has emerged since the publication of the original CAT is a great approach to educate students on critical appraisal. This also offers the opportunity to formally update the answer to the clinical question through a replicated CAT publication. Finally, students can learn to *generate* new questions, searches, appraisals, and answers. This is a higher level of critique and it is necessary for a student to, at least, understand the processes of appreciation and replication first. Something we both have experienced while teaching evidence-based practice (EBP) over the past 10 years, is that students often have a difficult time developing a brand-new clinical question that is relevant, searchable, and/or answerable with external evidence. By first helping students to appreciate the process and replicate what has been done previously, students tend to have a better ability to work through the CAT generation process. Published CATs offer the educational opportunity to build a sound evidence-based skill set by using external evidence in a logical manner to inform clinical decisions.

A CAT's Life in Clinical Practice

Similar to its education lives, the CAT has living purpose for clinical practice. Within a CAT, the clinical bottom line is meant to be the answer to the clinical question posed. Hopefully, with that answer, the clinician can decide if that answer can be ready to *implement* into clinical practice.

One aspect of the CAT that is important to informing clinical practice is the strength of recommendation.³ The strength of recommendation is based on the quality and consistency of the external evidence that was used to develop the clinical bottom line. While the sources of external evidence may be high quality, the answer may not necessarily be implemented easily or efficiently. Therefore, a critical step in successfully using a CAT's clinical bottom line in clinical practice is determining whether the answer can actually be implemented at the point of care. This opens the opportunity for clinical discussion and commentary about the value of answers from published CATs in clinical practice.

Beyond implementation, clinicians can *evaluate* the effectiveness of clinical bottom lines in practice. For example, questions such as “Does the answer from a published CAT enhance outcomes?” and “Based on the CAT, are the expected outcomes actually achieved in real life?” are those that the clinician can answer to determine the utility of the CAT answers, providing a robust benchmark for clinical practice. If the CAT results are

Figure 1 — The many lives of a Critically Appraised Topic (CAT). A published CAT can go on to live many “lives” through education, clinical practice, and research. CATs are living documents that make meaningful contributions to the available sources of external evidence.

validated, these individual patient encounters can be reported via Clinical CASE Reports.⁴ By evaluating the effectiveness of a CAT answer, a clinician can inform educators and researchers about its viability as a clinical decision-making tool.

Based on the implementation and evaluation of the CAT answer, reported outcomes are important to disseminate. When consistent outcomes are seen across multiple patient encounters and published Clinical CASE Reports, a strong clinical *recommendation* can be made to incorporate the answer into the education of future clinicians. The CAT is a vehicle to steer the direction of a profession’s body of knowledge.⁵ Clinicians take an active role in shaping this body of knowledge by sharing their implementation and evaluation experiences in using the best available external evidence to inform clinical decisions.

A CAT’s Life in Research

CATs rely on the available external evidence to answer clinical questions posed. Based on the limited quality and/or consistency of the external evidence available, a common result in many CATs is that more research is needed to formulate a stronger recommendation. The critical appraisal process helps uncover how future studies can be improved to enhance the quality of the future external evidence.⁶ One place to start the process of *refinement* is examining the evidence quality scores of the individual studies used. A researcher can use these quality scores to identify elements of a study that could be improved, and then make those changes, if possible, in upcoming investigations. This will, in turn, lead to better and higher-quality external evidence.

There may also exist a need to *expand* the clinical question into a different population, intervention, comparison, or outcome. For example, there may be clear evidence that an intervention (or a diagnosis, or a risk factor) results in a desired outcome in a given population. However, this evidence may not be easily generalizable into a different population. At that point, a new CAT can be developed to expand the PICO question to the new population of interest. By expanding the population (or intervention or

comparison or outcome), new research questions can be formed and new CATs generated.

Beyond refinement and expansion of the original CAT question, more might still be needed. *Synthesis*, through the performance of a systematic review (with or without meta-analysis), may be the next step. These would include a more exhaustive search of the literature and/or a pooling of a larger number of results. CATs can be an important first step in this process. It is important to remember that a CAT is meant to use the most recent available external evidence (typically within the last 5 years). Refining and expanding the CAT process may lead to a better ability to synthesize a more robust answer to the clinical question. Systematic reviews and meta-analyses are considered to be the highest level of evidence and the CAT provides us the framework to embark on the process of generating them.

How Long Does a CAT Live?

One important aspect of a CAT is its shelf life. A CAT answer expires approximately 2 years after its dissemination. CATs represent a current snapshot and brief review of the best current evidence found to answer a clinical question. To aid readers, authors, and reviewers, each CAT published in *IJATT* now has a “Kill Date”, mentioned just before the reference section. Based on the Kill Date, we can engage more meaningfully in the use of CATs for education, clinical practice, and research. No CAT lives forever. Rather, a CAT has many lives.

When looking through the lenses of education, clinical practice, and research, CATs take on new lives as replicated or new CATs (education), clinical CASE reports (clinical practice), and research reports and systematic reviews (research). Rather than viewing CATs as simple assignments, we can have our students complete CATs to help them grasp the EBP process, and we can see them for what they really are—living, transformative projects that unlock educational, clinical practice, and research opportunities that all make meaningful contributions to the available sources of external evidence.

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