

Keeping up with Best Evidence: What Resources are Available?

Nasir Hussain, Sarah Turvey, Mohit Bhandari

ABSTRACT

Evidence-based medicine (EBM) teaches physicians to base their decisions and actions on the best available scientific evidence in conjunction with their own expertise and the patient's values and preferences; however, this can be very time consuming as a one has to stay current and up-to-date with the most recent evidence. Several point-of-care databases, such as UpToDate and Dynamed, have been developed that distill the contents of medical journals into summaries with guidelines for practice in order to aid in EBM approach, but these also come with various limitations. Due to this, tools specific to surgical specialties are now beginning to be developed that systematically collect, appraise and summarize top quality evidence. One such tool is OrthoEvidence, which is an open-access tool for orthopedic surgeons, researchers and allied healthcare professionals.

Keywords: Evidence, OrthoEvidence, Reviews, Summary.

How to cite this article: Hussain N, Turvey S, Bhandari M. Keeping up with Best Evidence: What Resources are Available? J Postgrad Med Edu Res 2012;46(1):4-7.

Source of support: Nil

Conflict of interest: None declared

EVIDENCE-BASED MEDICINE

Historically, physicians used their own knowledge of human pathophysiology to determine the course of treatment for their patients; however, it is currently understood that this is not sufficient to make an effective treatment decision.¹ Today physicians base their decisions and actions on the best available scientific evidence in conjunction with their own expertise and the patient's values and preferences.² This allows clinical practice to evolve with the development of new practices and the acquisition of new medical knowledge.

Practicing evidence-based medicine requires the physician to first formulate a clinical question.³ Using the PICO format, as seen in Figure 1, will help aid the physician in limiting the scope of their evidence search to information that is relevant to their patient and practice.^{3,4} Once the evidence is collected, the physician is required to appraise the evidence based on its reliability and validity. To aid in this process, various tools and guidelines have been developed which include the users guides and the Oxman and Guyatt index. Finally, after careful review the physician can apply the evidence in conjunction with their own clinical expertise and the patient's preferences to treat the patient most effectively.³

CHALLENGES FOR PHYSICIANS PRACTICES EVIDENCE-BASED MEDICINE

Though this method of practice is superior to historical methods, it is not without accompanying various challenges. For instance, research in adult internal medicine has demonstrated that physicians would need to read 17 articles each day to stay up-to-date with current evidence.⁵ This daunting task can be very difficult to achieve and is highly time-consuming. Another similar challenge relates to the significant time required to access and appraise research findings by the physician before it can contribute to their overall clinical practice. Many physicians are not trained in such research methods and may not have the skills required to access and critically appraise relevant articles to determine the strengths of its recommendations. This can ultimately lead to unreliable and incorrect treatment decisions, if emphasis is placed on a poorly conducted study.⁶ This is especially problematic in surgical specialties given that there is already less stringent controls on the validation of new technologies or surgical techniques. Studies show that higher quality evidence, such as systematic reviews and randomized controlled trials (RCTs) may only comprise 5% of the content of leading surgical journals.² This suggests that more surgical practice may be based on low-quality evidence and, therefore, has a higher potential to negatively influence surgical decisions.

THIRD GENERATION TOOLS: SUMMARIES AND GUIDELINES

To address this problem, third-generation tools have been created that distill the contents of medical journals into summaries with guidelines for practice.⁴ There are several of these tools that have been established including first



Fig. 1: The PICO format for clinical research questions

Consult, UpToDate, DynaMed, clinical evidence and PIER. The need for such tools has been demonstrated in a study which found that when physicians sought the answers to 46 clinical questions using their own choice of resources, they did not always come to the correct answer.⁷ These same physicians were also occasionally found to incorrectly change treatment options based on the evidence collected. In the same study, when physicians were supplied with reliable sources, there was an increased rate of correct answers, and thus, the initial discrepancy was found to be attributed to the improper collection and critical appraisal of evidence by the physician.⁷ Tools, such as UpToDate and DynaMed serve as reservoirs for appraised and summarized data in order to aid in the decision-making process.

The summaries of evidence that are provided by these tools include content from 80 to 500 medical journals of which the most relevant evidence is systematically selected, reviewed and appraised.⁸⁻¹² Appraised evidence and guidelines are generally presented in conjunction with a number or a letter representing the quality of the evidence or the strength of recommendation as seen in Figure 2. The assessment of guidelines is based on a GRADE approach which classifies the strength of a recommendation based on the balance between benefits, risks, cost, degree of confidence in estimates of benefits and burden. This same system classifies quality of evidence based on factors, such as risk of bias, precision of estimates, consistency of results and directness of evidence.¹²

LIMITATIONS OF THIRD-GENERATION TOOLS

As outlined above, there are clear incentives for physicians to use these tools to guide clinical practice; however, it is

important to be weary of the limitations to these resources. These limitations are presented in Table 1. A particularly noteworthy limitation is that many tools only include RCT and systematic reviews. This level of evidence only comprises 5% of the content of the leading surgical journals.² It, therefore, stands to reason that the surgical content of these tools would be extremely limited and thus the utility of these tools for surgeons would be inadequate. As a result of this, surgeons and researchers alike may be required to spend significant amounts of time on these resources in order to find the desired evidence. Due to this problem, specific resources for surgical specialties are beginning to be developed that systematically collect, appraise and summarize the evidence for top-quality clinical trials which include RTCs and meta-analyses. One such free and open access database for orthopedics is titled Orthoevidence (www.myorthovidence.com) (Fig. 3).

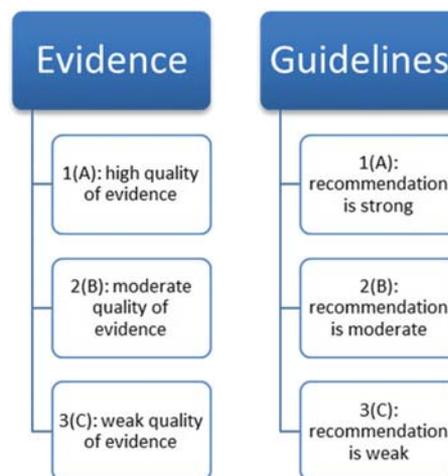


Fig. 2: Grades used for assessing the quality of evidence

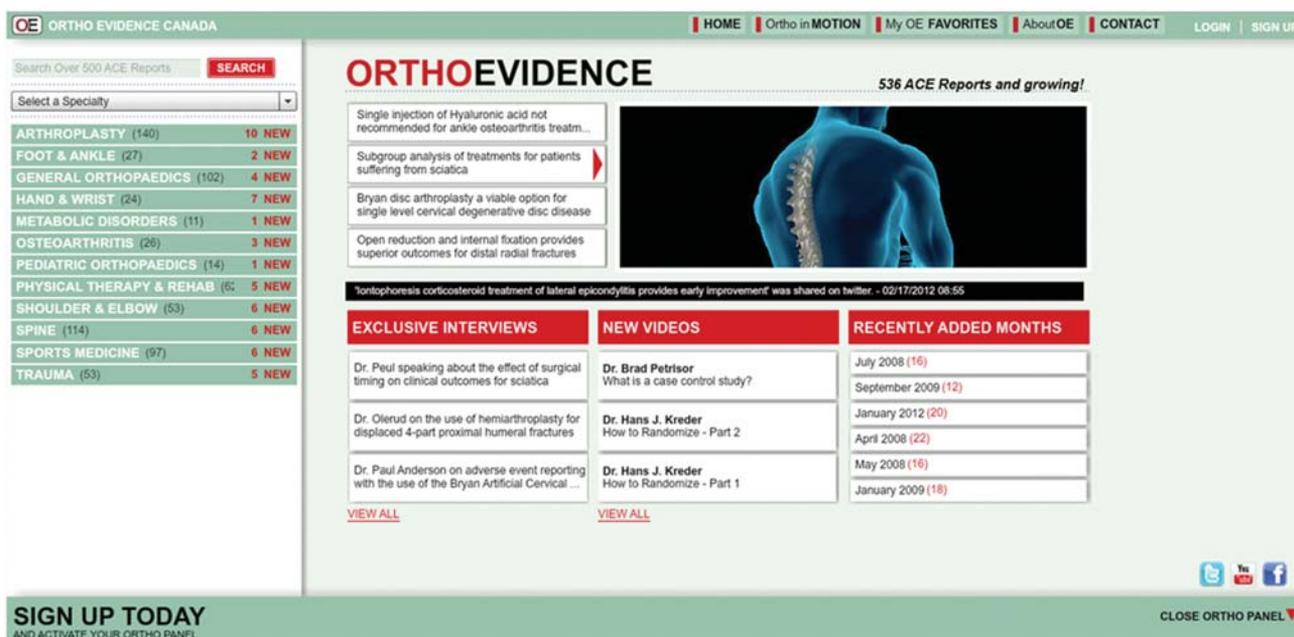


Fig. 3: The home page of OrthoEvidence

Table 1: The limitations of point of care tools

<p>Limitations in the use of point of care tools to guide clinical decision making</p> <ul style="list-style-type: none"> Summarizing evidence means excluding some potentially relevant details⁹ Evidence presented cannot be generalized to all population⁹ Only covers select conditions⁹ Emphasize RCT and systematic reviews and, therefore, may overlook high-quality studies lower on the hierarchy of evidence¹⁰ Updated only periodically⁸

**WHAT IS ORTHOEVIDENCE?
(WWW.MYORTHOEVIDENCE.COM)**

OrthoEvidence is uniquely different from other databases since it presents the evidence to the clinician and researcher as opposed to summarizing large bodies of evidence into guidelines, which is done in databases, such as UpToDate and DynaMed. This is highly advantageous since it allows one to view directly the benefits and drawbacks of the evidence in the topic of interest. In addition, for the clinician that does not have the significant time and commitment required to search for relevant articles, OrthoEvidence systematically searches and screens a wide range of journals for randomized trials, which represent top-quality evidence. For each trial, a summary report is then prepared that captures the important and relevant information from the initial publication. These summary reports contain information pertaining to the rationale for the study, the importance of the results as well as key results, and the clinical implications (Fig. 4). Thus, unlike clinical guideline databases, OrthoEvidence prevents the loss of key information that is relevant for clinical practice and research through the creation of unique summary reports for each trial.

OrthoEvidence is also beneficial for those clinicians and researchers who do not have the sufficient abilities to critically appraise evidence. Here, each included randomized trial or meta-analysis on OrthoEvidence receives a thorough risk of bias assessment. The quality assessment considers various questions relating to the level of blinding, the scheme for randomization and the overall applicability of the results to day-to-day practice. By conducting the critical appraisal, OrthoEvidence provides a holistic view for each piece of evidence in an objective manner. In addition, the tool saves clinicians and researchers the significant time commitment required to properly critically appraise.

Although the majority of OrthoEvidence is devoted to presenting users with critically appraised summary reports for each trial, there are other numerous features that are unique to the website. After the creation of a summary report, the authors of the initial journal publication are

invited to comment, provide feedback and conduct exclusive interviews in regards to the content. This author verification process provides assurance to the users that the summary reports are accurate and reliable. For those reports for which interviews are conducted, the user is able to gain deeper insights into the specific research and future implications. Exclusive content available to users does not stop here. OrthoEvidence also provides users with access to various instructional videos from impact clinicians and researchers within orthopedics. Thus, not only does the web site enrich personal knowledge about research in the field, but it also enables one to learn about key topics in evidence-based medicine. For this reason and the various reasons discussed above, we recommend that you view the tool yourself.

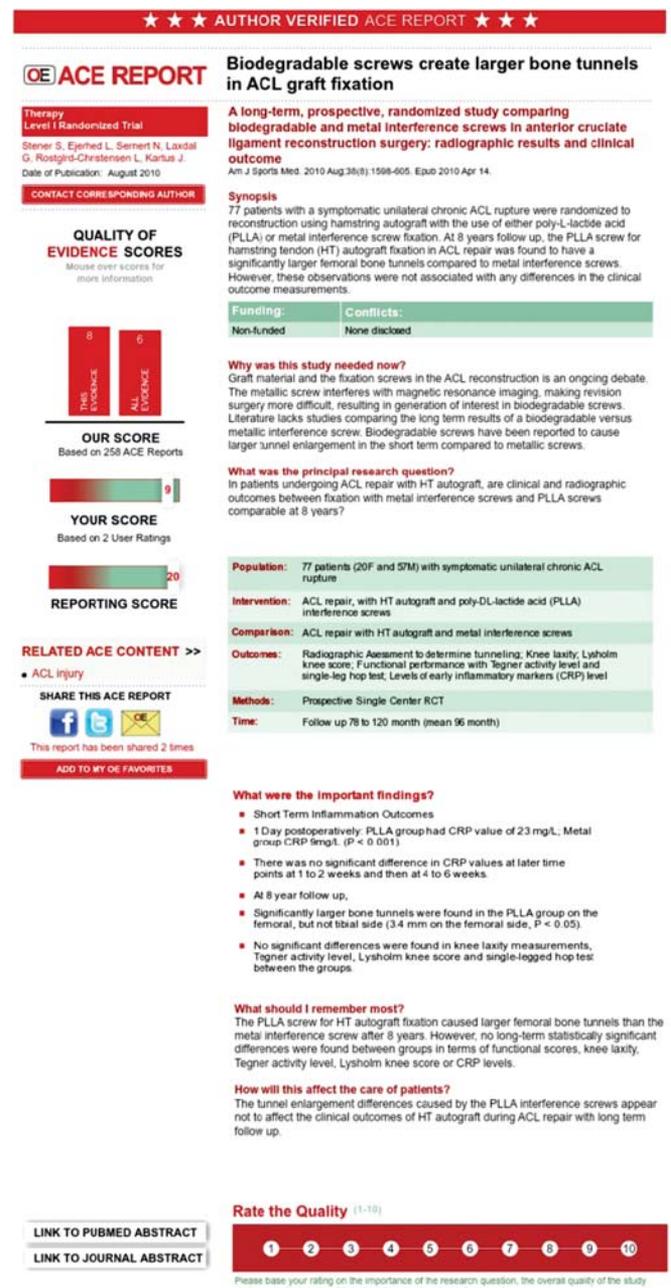


Fig. 4: The layout of an ACE report on OrthoEvidence

CONCLUSION AND FINAL REMARKS

Here, we present to you the various resources and databases that are most commonly used by clinicians and researchers. For broad guidelines, we suggest you to utilize clinical guidelines, such as DynaMed and UpToDate. On the contrary, for something more specific for your specialty, we suggest you turn to something similar to OrthoEvidence, which was developed for orthopedics. The advantages of using specific tools such OrthoEvidence are plenty and we encourage you to experiment with it. All in all, the use of clinical databases will expand your knowledge and assist in the practice of evidence-based medicine.

REFERENCES

1. Sackett DL, Rosenberg WM. The need for evidence-based medicine. *Journal of the Royal Society of Medicine* 1995; 620-24.
2. Panesar SS, Philippon MJ, Bhandari M. Principles of evidence-based medicine. *Orthopedic Clinics of North America* 2010; 131-38.
3. Bhandari M, Giannoudis PV. Evidence-based medicine: What it is and what it is not. *Injury: International Journal of the Care of the Injured* 2006;302-06.
4. Brouwers M, Stacey D, O'Connor A. Knowledge creation: Synthesis, tools and products. *Canadian Medical Association Journal* 2010;E68-72.
5. *British Medical Journal*. Evidence based-medicine a new journal to help doctors identify the information they need. *British Medical Journal* 1995;1085-86.
6. Elphick HE, Smyth RL. Research: The principles of evidence-based medicine. *Current Paediatrics* 2004;525-31.

7. Goodyear-Smith F, Kerse N, Warren J. Evaluation of e-textbooks DynaMed, Consult and UpToDate. *Australian Family Physician* 2008;878-82.
8. Overview PIER. In American College of Physicians. Retrieved March 2, 2012, from <http://pier.acponline.org/index.html>
9. About Clinical Evidence. In *British Medical Journal*. Retrieved March 2, 2012, from <http://pier.acponline.org/index.html>
10. About DynaMed. In EBSCO. Retrieved March 2, 2012, from <http://dynamed.ebscohost.com/about/about-us>
11. About MD Consult. In Elsevier. Retrieved March 2, 2012, from <http://www.mdconsult.com/php/331322990-255/home.html>
12. About UpToDate. In UpToDate, Retrieved March 2, 2012 from <http://www.uptodate.com/home/about/index.html>

ABOUT THE AUTHORS

Nasir Hussain

Department of Clinical Epidemiology and Biostatistics, McMaster University, Canada

Sarah Turvey

Division of Orthopedic Surgery, McMaster University, Canada

Mohit Bhandari

Division of Orthopedic Surgery, McMaster University, Canada

CORRESPONDING AUTHOR

Mohit Bhandari, Professor, Division of Orthopedic Surgery, Department of Orthopedic Surgery, 293 Wellington Street North, Suite 110, Hamilton, ON, L8L 8E7, Canada, e-mail: bhandam@mcmaster.ca