

How to Critically Appraise Evidence

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Introduction

This second part of Tool Kit 1, which builds upon section 3.1A.1 ("How to Do a Basic Search for Evidence"), demonstrates how to critically appraise the information found in a literature search. The goal is similar to that of Part 1, to help pharmacists in developing an evidence-based practice.



What is Critical Appraisal and Why is it Important to Pharmacists?

The process of critical appraisal distinguishes between evidence of high quality and evidence of lesser quality. It also helps in determining the applicability of the information to specific patients or patient populations. Literature searches and critical appraisals are useful in making clinical decisions, preparing formulary submissions, and conducting research. Ultimately, critical appraisal facilitates clinical decision-making and affects patient care. As with many skills, critical appraisal becomes easier with practice. An example of a formulary submission form is included in this toolkit: see Appendix A - William Osler Health System Formulary Submission Form. (Permission granted by William Osler Health System.)

Appendix A:

[3.1AppendixA_RequestforFormularyStatus.pdf](#)



How Do I Appraise a Scientific Article?

The items in this tool kit may help you to critically appraise scientific articles.

- 1) Presentation entitled "Drug Information and Critical Appraisal Workshop": This presentation, which was originally presented at William Osler Health System in January 2009, and updated in September 2010, is divided in 2 parts. Part I provides an overview of common drug information resources, the questions to consider in critical appraisal, and a few key points pertaining to formulary submissions. Part II is an exercise in critical appraisal, evaluating a published clinical trial. (Courtesy of Miranda So, BSc, BScPhm, PharmD.)

Appendix B -- Drug Information and Critical Appraisal Workshop Part I

[3.1AppendixB DrugInformationandCriticalAppraisalWorkshop_Part1.pdf](#)

Appendix C -- Drug Information and Critical Appraisal Workshop Part II

[3.1AppendixC DrugInformationandCriticalAppraisalWorkshop_Part2.pdf](#)

- 2) Therapeutic Decision Making website: This site (authored by Peter Loewen, BScPharm, ACPR, PharmD) is intended for "clinicians who are dedicated to advancing their knowledge and skills related to evidence-based pharmacotherapeutic decision-making. The resources ... are intended for self-directed, objective-based learning." The website offers a multitude of useful links and continuing education documents to help pharmacists develop their skills and confidence in practising evidence-based medicine.

http://www.vhpharmsci.com/decisionmaking/Therapeutic_Decision_Making/Fundamentals.html

- 3) Presentation entitled “Appraising Systematic Reviews”: This presentation, which was originally given at the CSHP Summer Educational Session Conference in Halifax, NS, in August 2010, summarized key components of systematic reviews and introduces 2 tools that may help clinicians to clinically assess systematic reviews. (Courtesy of Richard Slavik, PharmD)

Appendix D -- EBM Workshop: Appraising Systematic Reviews

[3.1AppendixD_AppraisingSystematicReviews.pdf](#)

- 4) Critical appraisals related to use of probiotics to prevent antibiotic-associated diarrhea: This item presents evaluations of the randomized controlled trials identified in the literature search outlined in section **3.1A (“How to Do a Basic Search for Evidence”)**. This search relates to a physician's question about use of probiotics in preventing antibiotic-associated diarrhea.

Appendix E -- Critical Appraisal to Address a Clinical Question Example #1

[3.1AppendixE_CriticalAppraisaltoAddressClinicalQuestion.pdf](#)

- 5) Critical appraisals related to antimicrobial stewardship: This item presents a series of critical appraisals to answer a clinical question about antimicrobial stewardship.

Appendix F -- Critical Appraisal to Address a Clinical Question Example #2

[3.1AppendixF_CriticalAppraisalAntimicrobialStewardship.pdf](#)

- 6) Open-access websites: These sites provide systematic reviews from organizations involved in critical appraisal.
- Canadian Agency for Drugs and Technology in Health: <http://www.cadth.ca/index.php/en/home>
 - National Institute for Health and Clinical Excellence (UK): <http://www.nice.org.uk/>

- Agency for Healthcare Research and Quality (US): <http://www.ahrq.gov/>
 - Institute for Clinical Evaluative Sciences (Canada): <http://www.ices.on.ca/webpage.cfm>
- 7) Federated search engines (which search online resources and multiple databases) and related resources: As busy clinicians, we may not always have time to search MEDLINE® or other databases and to critically appraise individual scientific articles. "Federated search engines" search databases for clinical topics for which key publications have already been critically appraised. One inherent drawback of these sites is that they other clinicians' judgment and expertise. Therefore, the user should be aware of the potential for bias and should maintain a critical approach when reading others' critical appraisals. (List courtesy of Derek Jorgenson, BSP, PharmD) Federated search engines (searching critically appraised clinical information):
- TRIP database (free): www.tripdatabase.com
 - Dynamed (payment required): www.ebscohost.com/dynamed/

Other sites with synopses of evidence or critically appraised topics:

- National Guidelines Clearinghouse (US) (free): www.guideline.gov
- Database of Abstracts of Reviews of Effects (DARE) (free): <http://www.crd.york.ac.uk/CMS2Web/AboutDare.asp>
- ACP Journal Club (free; payment required for "plus" subscriptions): <http://www.acpjc.org/index.html>
- Cochrane Library (summaries free; payment required for detailed reports): <http://www.thecochranelibrary.com/view/0/index.html#http://www.thecochranelibrary.com/view/0/browse.html>

- E-medicine (free): <http://emedicine.medscape.com/>
- UpToDate (payment required): <http://www.uptodate.com/home/index.html>
- JournalWatch (email alerts free; detailed appraisals not free): www.jwatch.org/
- Canadian Pharmacist's Letter (payment required): <http://canadianpharmacistsletter.therapeuticresearch.com/home.aspx>
- Newsletters and bulletins provided by drug information centres (subscription generally required).

How Do I Evaluate My Skills in Searching and Appraising Clinical Evidence?

Online resources are available to help assess skills in searching in appraising clinical evidence:

- Rana GK, Bradley DR, Hamstra SJ, et al. A validated search assessment tool: assessing practice-based learning and improvement in a residency program. J Med Libr Assoc 2011 Jan;99(1):77-81.
- Primary Care Portal - Evidence-based Resources: http://web.mac.com/malees/Primary_Care_Portal/EBM.html
- Evidence Updates service: <http://plus.mcmaster.ca/EvidenceUpdates/Default.aspx>
- Centre for Evidence-Based Medicine (Toronto, Ontario): <http://www.cebm.utoronto.ca/>
- Centre for Evidence-Based Medicine (Oxford, UK): <http://www.cebm.net/?o=1011>
- JAMAEvidence: <http://www.jamaevidence.com/>
- Therapeutics Initiative (University of British Columbia): <http://www.ti.ubc.ca/>

- Clinical Evidence (BMJ resource):
http://clinicalevidence.bmj.com/ceweb/resources/useful_links.jsp
- Grey Matters (search tool for grey literature; Canadian Agency for Drugs and Technology in Healthcare):
<http://cadth.ca/en/resources/grey-matters>
- The NNT Group: <http://www.thennt.com/>
- Clinical significance calculator (University of British Columbia):
<http://spph.ubc.ca/sites/healthcare/files/calc/clinsig.html>
- University of Wisconsin Evidence-based Medicine. Includes online evidence-based calculators and worksheets:
<http://www.med.wisc.edu/education/md/curriculum/ebm/online-calculators-and-worksheets/579>
- Essential Evidence Plus (Wiley Blackwell):
<http://www.essentialevidenceplus.com/>
- Key Clinical Guidelines and Statements: Available free of charge to registered users at:
<http://www.canadianhealthcarenetwork.ca/>. Once registered, select heading of "Pharmacists" and then Clinical, and finally "Guidelines".