PEARLS™ Handbook

An Evidence-Based Practice Reflection Exercise
Acknowledgements

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Previous Edition

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What is Pearls™?

Pearls™ is a self-directed, evidence-based practice reflection exercise designed to facilitate the integration of new knowledge and/or skills into your practice.

The semi-structured Pearls™ template guides you through a five-step inquiry and reflective process. This process helps you to find valid, reliable and relevant answers to your clinical questions; as well, it prompts you to develop a plan for putting new information ‘to work’ in your practice.

Pearls™ is offered at no cost to CFPC members – the $25.00 administrative fee has been waived.

The Principles

Several guiding principles were followed in developing Pearls™:

- **It should be largely self-directed** – allowing physicians to complete exercises at their own pace
- **It should be practical** - allowing physicians to explore information that is relevant to their practice
- **It should be challenging** - allowing members to examine their current practices, knowledge and ability to provide evidence-based care
- **It should be reflective** – allowing members to assess the impact of their decisions after an elapsed period of time

We also wanted Pearls™ to challenge some of the traditional beliefs about CME...

In traditional CME, physicians attend didactic presentations or read books and journals in a rather unsystematic way. Physicians are often presented with a quantity of largely unfiltered information – and from this information, they might extract only a few key items that could benefit their practice. Research has shown that few practice-based changes are made as a result of this type of CME. A more effective way to integrate new information into your practice is to begin with a specific practice question.

"A more effective way to integrate new information into your practice is to begin with a specific practice question."

Pearls™ has been designed to guide physicians through a logical, five-step process that begins with the formulation of a question, followed by seeking and analyzing appropriate information (by completing a literature search and critically appraising the identified articles). Pearls™ then prompts participants to use the information gleaned to make an informed decision about their own practice - and later, to evaluate or reflect upon that decision.
In order to meet the requirements of an organized and accountable maintenance of certification program, the format of Pearls has to be somewhat prescriptive. However, beyond expecting that each of the exercise’s five steps be completed, there are no “pass-fail” decisions made about a member’s participation.

The participant is in complete control of the pace of learning, the kind of information sought, and the decision to change his or her practice accordingly. The College is primarily interested in encouraging members to assess their practices, to purposefully seek appropriate information, and to make sound clinical decisions based on best available evidence.

“**The participant is in complete control ... The College is primarily interested in encouraging members to assess their practices, to purposefully seek appropriate information, and to make sound clinical decisions based on best available evidence.**”

**Before you get started...**

The first thing to do is carefully read this entire package to understand how Pearls™ works - and to become familiar with the available resource materials (see appendices 1 -4).

We provide forms that you may use to request assistance from the Canadian Library of Family Medicine; as a member of the CFPC, you have access to free literature searches and journal articles (see Appendix 3 for details). As well, there are optional worksheets that can be used to assist with the critical appraisal portion of the exercise (Step 3). Copies of these forms are available through our website or can be faxed/mailed to you directly (contact the CPD Department at 905.629.0900 or 1.800.387.6197 extension 204).

There is no right or wrong way to do any of these steps. The question, the articles, the decision and how you reflect on it are all under your control. Though a certain degree of thoroughness is necessary to
ensure that your question receives enough critical thought, the most important aspect is its relevance to you and your practice.

**Did you know that CFPC members have access to the Canadian Library of Family Medicine services? This includes:**

- Five (5) **free** literature searches per year
- 25 **free** articles per year
- Personal online literature search assistance

**For more information see Appendix 3 of this document.**

**Step 1: Formulate your question**

The first step is to formulate a specific clinical question that is relevant to your practice. Your question might be related to:

- Clinical skills (e.g. *How do I determine if a murmur suggestive of MVP is significant?*)
- Therapeutic options (e.g. *What is the most appropriate option for treating erectile dysfunction in young men?*)
- New diagnostic tools/test (e.g. *Should I start using a rapid assay test for Streptococcus in my office?*)
- Communication skills (e.g. *What is the best way to broach the subject of possible spousal abuse?*)
- Or anything else that relates to your practice...

Questions may arise from interactions with patients, from review of recently published studies, from discussions with colleagues or reading a recently published clinical practice guideline or CPGs (see Appendix 1 for a list of recently published Canadian CPGs). **The choice of clinical question is entirely up to you.**

**Step 2: Seek the appropriate information**

The next step is to seek the appropriate information to answer your clinical question. This step of the exercise requires that you complete a **literature search**. Appendix 1 lists a variety of quality information resources that you can search find answers to clinical questions. A literature search can be accomplished in a number of ways - if you have never conducted a literature search or wish to learn more about the process, please refer to Appendix 2 of this document.

Many local hospital and medical school libraries have searching capabilities and experienced librarians who are willing to help physicians learn how to perform a literature search. The **Canadian Library of Family Medicine** (CLFM) provides a literature searching service for College members. All members are entitled to five (5) free literature searches each year and others can be requested for a nominal fee (see Appendix 3 for more information on CLFM services).

The number of articles that your search yields will depend upon the specificity of your question and/or the search criteria used. A question such as "Should I give my elderly patients the Pneumococcal
“Vaccine?” is more easily addressed than “How can I improve preventive measures and screening in my practice?” Be sure to record the MeSH (Medical Subject Headings) terms or key words used in your final search strategy, and the total number of articles identified from your search; you will be asked to report this information on the Pearls™ exercise submission form.

**Step 3: Evaluate the information**

The third step is to select the key article(s) from among those identified by your search. Ideally, you should select articles that:

- Report original research data, and/or;
- Report recently published systematic review articles, and/or;
- Focus on clinical practice guidelines (if based on careful, thorough reviews of research data).

Critically appraise each article as it pertains to your stated clinical question. Are the results and/or recommendations valid? Can the results and/or recommendations be applied to your practice?

If you have not had training in critical appraisal of literature, there are many resources that can guide you through this process (see Appendix 4 of this document for suggested resources). Many of these resources are available locally or through the CLFM.

As well, the CFPC has developed four critical appraisal worksheets that you can use to assist you in this step of the Pearls™ exercise (optional). Each worksheet is geared toward a specific type of article:

- Diagnostic tests
- Therapeutic options
- Review articles
- Clinical practice guidelines

These are derived from articles in the very successful Users’ Guides to the Medical Literature published in JAMA from 1993 to 1997 by The Evidence-Based Medicine Working Group at McMaster University. Those with limited experience in critical appraisal should find these worksheets helpful. Their use is optional and they are not to be submitted with the submission form.

**Step 4: Make a practice decision**

Now that you have analyzed the best available information/data, it is time to answer your clinical question and determine how best to integrate this new knowledge into your practice in a meaningful way.

Often a review of the evidence will lead to changes in your current practice. However, there will be times when the evidence reinforces your current practice – helping to validate your current approach. If insufficient evidence is available to answer your clinical question, you might decide to revisit the issue at a later date and make no changes to your practice at this time.
There may also be barriers (human resources, financial, time, policy, etc.) that prevent you from successful introducing new practices or guidelines. For example, a decision to introduce a new recall system for a disease prevention intervention may have implications for your office staffing. Developing strategies to address these issues may be crucial to the success of implementing new knowledge into your practice.

Once you have completed Step 4 of the Pearls™ submission form:

- Record the date (see space provided)
- Indicate the approximate number of hours spent to date on the exercise
- Place the form in a safe place

It is now time to apply the clinical decision recorded in Step 4. You must allow a sufficient period of time to elapse between Steps 4 and 5 to allow for you to assess the impact of your clinical decision.

Once you feel that a sufficient amount of time has elapsed to allow you to assess the implementation of your clinical decision from Step 4 (total time will vary based on your level of expertise and/or comfort with the topic/issue, the number of opportunities you have to apply/test your clinical decision, etc.) you may complete Step 5 of the Pearls™ exercise.

**Step 5: Evaluate the impact of your decision**

The final step of the Pearls™ exercise asks you to reflect on your experiences in applying your clinical decision (from Step 4). In evaluating the impact of your decision, you might ask yourself the following:

- How successful have I been in implementing the stated decision (Step 4) into my practice?
- Was my assessment of the literature appropriate in terms of applicability to my practice?
- Have I encountered new information or evidence that might further impact my stated decision?
- Am I/will I do anything differently as a result of completing this Pearls exercise?

Once you have completed Step 5, you are finished. All that is left to do is to:

- Sign and date the completed submission form on the bottom of the second page
- Return the form to the CFPC by fax, mail or email
- Confirmation of receipt and credits will be sent to you by email or mail

Remember that there will be no judgment made about the value of your question, decision or experience. We will only review the form to verify that you have completed each of the five steps. This is not a pass-fail exercise.
APPENDIX 1: Information Resources

This section lists and describes quality information resources that can help you find answers to clinical questions. Resources are listed under the following headings: Databases (bibliographic and knowledge databases), Clinical practice guideline collections, Textbooks (print and electronic textbooks), Pre-filtered evidence repositories, and Other websites or portals which contain evidence-based resources. Some resources may fit in more than one category, but they are listed only once.

Resources for which there is a cost are marked “$”; some of these may be available as a benefit of affiliation with an organization or association.

**DATABASES**

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
<th>Available from</th>
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<tbody>
<tr>
<td><strong>Cochrane Library</strong></td>
<td>A collection of four databases, the most heavily used being the Cochrane Database of Systematic Reviews (CDSR). CDSR is a collection of high quality systematic reviews of the effects of health care interventions. Reviews focus on randomized controlled trials, including unpublished trials, analyzed by collaborative review groups organized through the Cochrane Collaboration.</td>
<td><a href="http://www.cochrane.org/">http://www.cochrane.org/</a></td>
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<tr>
<td><strong>Dynamed</strong></td>
<td>A database that consists of summaries of evidence for ~ 3,000 clinical topics. A 7-step process identifies the best available evidence for inclusion. Dynamed uses Strength Of Recommendation Taxonomy (SORT), and quality of evidence is labeled Grade A,B, or C. The summaries focus on patient-oriented outcomes.</td>
<td><a href="http://www.ebscohost.com/dynamed/">http://www.ebscohost.com/dynamed/</a></td>
</tr>
<tr>
<td><strong>Essential Evidence Plus</strong></td>
<td>A database that allows searching of multiple resources at once. The resources include EBM Guidelines; POEMs; Cochrane Abstracts; Selected Practice Guidelines from the National Guideline Clearinghouse; Decision Support &amp; Diagnostic Calculators; Derm Expert. EEPlus includes an archive and alerts of POEMS – Patient Oriented Evidence that Matters.</td>
<td><a href="http://www.essentialevidenceplus.com/">http://www.essentialevidenceplus.com/</a></td>
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Ovid Medline

This is the Medline database produced by the US National Library of Medicine (NLM), offered through the Ovid search interface, which has different features from NLM's PubMed/Medline. Most universities with medical schools provide access to Ovid Medline.

$ annual subscription

Available from: http://www.ovid.com/

PEPID

The database includes evidence-based summaries on ~2000 medical topics; a Drug Database with ~7,500 drug, herbal and OTC generic and trade names, a Drug interaction generator, and ~ 250 medical calculators. It includes links to FPIN (Family Practice Inquiries Network) clinical questions and answers. PEPID was primarily designed for handhelds and mobile devices, but is also available online.

$ annual subscription

Available from: http://www.pepid.com/

PubMed/Medline

The premier North American bibliographic database, produced by the US National Library of Medicine, which covers the world's biomedical and health sciences journal literature. It consists of ~ 19 million citations, with links to participating online journals. PubMed has a “Clinical Queries” feature which allows for rapid searching for systematic reviews and evidence-based literature on therapy, diagnosis, etiology, and prognosis. There are numerous other special features. Excellent help and tutorials are available from the menu on the left of the PubMed screen.


Trip Database (Turning Research into Practice)

The Trip search engine searches its database of hundreds of medical websites, which emphasize evidence-based information and clinical guidelines. TRIP aims to allow users to rapidly identify the highest quality clinical evidence for clinical practice. Search results are filtered by categories such as CPGs, systematic reviews, clinical questions, E-textbooks, and can also be filtered by specialization.

Available from: http://www.tripdatabase.com

CLINICAL PRACTICE GUIDELINE COLLECTIONS

Alberta Medical Association. TOP/Clinical Practice Guidelines
The Toward Optimized Practice (TOP) program is a health quality improvement initiative that maintains and distributes Alberta Clinical Practice Guidelines. Clinical practice guidelines cover key areas of medical practice such as cancer, emergency medicine, infectious diseases and more.

Available from: [http://www.topalbertadoctors.org/cpg.html](http://www.topalbertadoctors.org/cpg.html)

<table>
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<tr>
<th><strong>Canadian Immunization Guide.</strong></th>
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<tr>
<td>The Guide includes sections on such topics as vaccine safety and adverse affects, recommended immunizations, and immunization of health care workers. It was developed by the National Advisory Committee on Immunization (NACI) and is published by the Public Health Agency of Canada. The Guide is available in print, pdf, and in a searchable online version. The 7&lt;sup&gt;th&lt;/sup&gt; edition was published in 2006. Print Cat: HP40-3/2006E ~$23.00 ISBN: 0-660-19392-2</td>
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<tr>
<th><strong>CMA Infobase Clinical Practice Guidelines</strong></th>
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<tr>
<td>A searchable collection of ~1300 clinical practice guidelines that are produced or endorsed by a national, provincial or territorial medical or health organization, professional society, government agency or expert panel in Canada. Links to the full text of guidelines are provided for the majority of the guidelines.</td>
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<tr>
<td>Available from: <a href="http://www.cma.ca">http://www.cma.ca</a></td>
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<table>
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<tr>
<th><strong>CMAJ - Clinical Practice Guideline Collection</strong></th>
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<tr>
<td>Links to Clinical Practice Guideline articles published in CMAJ. These range from condition-specific treatment guidelines to broader commentaries and editorials with policy as well as practice implications. ~60 guidelines are listed as of 2009.</td>
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<tr>
<th><strong>National Guideline Clearinghouse (NGC)</strong></th>
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<tr>
<td>This is a database of ~2400 evidence-based clinical practice guidelines published by the US Agency for Healthcare Research and Quality (AHRQ). Organizations submit guidelines to be included in the database, and NGC provides detailed structured summaries and comparisons. The majority of guidelines are from the US, but some guidelines from Canada and other countries are included.</td>
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<th><strong>National Library for Health: Guidance</strong></th>
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<td>A database of UK approved evidence-based clinical guidelines available on the internet in full-text. All guidelines are produced under the auspices of an international or national medical specialty association, relevant professional society or government agency. It is a requirement for inclusion that a</td>
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systematic literature search and review of existing scientific evidence was performed.

Available from: [http://www.library.nhs.uk/guidance/](http://www.library.nhs.uk/guidance/)

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<th><strong>Ontario Guideline Advisory Committee (GAC)</strong></th>
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<td>The GAC identifies, summarizes, and evaluates clinical practice guidelines covering key areas of medical practice. Guidelines are rated with the AGREE guidelines evaluation tool. This program was established by the Ontario Medical Association and the Ontario Ministry of Health, and now is joined with the Centre for Effective Practice. The database contains ~200 evaluated guidelines in 2009.</td>
</tr>
<tr>
<td>Available from: <a href="http://gacguidelines.ca/">http://gacguidelines.ca/</a></td>
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<th><strong>Public Health Agency Guidelines</strong></th>
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<tr>
<td>This website gives access to guidelines that support Canada's disease prevention and control efforts. Topics include Biosafety, Cancer, HIV/AIDS, Infection Control, Laboratory, Sexually Transmitted Infections (STI), Travel Health/Quarantine, Tuberculosis (TB), and Vaccines and Vaccine-Preventable Diseases.</td>
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TEXTBOOKS

**eMedicine**

eMedicine is a free, peer-reviewed online medical textbook for medical professionals published by WebMD. It contains advertisements. eMedicine contains articles on over 6,500 diseases and medical topics, and is illustrated with numerous multimedia files. It is browsable in 38 clinical categories. eMedicine is a part of the WebMD Health Professional Network that includes Medscape.com.


**Clinical Evidence**

This is an evidence-based textbook, published by the BMJ Publishing Group, which provides a summary of what is known and not known about the treatment and prevention of 240+ common conditions. Reviews are constantly updated and integrated with a range of additional EBM resources. Clinical Evidence rates interventions and provides GRADE evaluations of quality of evidence. Clinical Evidence is available online, for PDAs, and as a print handbook.

Available from: [http://clinicalevidence.bmj.com](http://clinicalevidence.bmj.com)

**Mosby's Family Practice Sourcebook**


**Harrison's Principles of Internal Medicine**


$ annual subscription.
| **Stat!Ref** | An electronic library of ~65 medical texts covering a wide range of clinical specialties, and including many classic texts and the Lange “Current Diagnosis and Treatment” series. The texts may be searched individually, all at once, or in customized groups. Clicking on a selection shows detailed information in full-text book format complete with tables and graphics.  
$ annual subscription  
| **UpToDate** | An electronic textbook that covers ~7,400 topics in 13 medical specialties. Topic reviews are usually based on a specific clinical condition or management issue. It offers a synthesis of the literature, the latest evidence, and specific recommendations. Some levels of evidence are provided. UpToDate is integrated with a drug interactions database. Available on the web, desktop computer, and PDA.  
$ annual subscription  

**PRE-FILTERED EVIDENCE REPOSITORIES**

| **Bandolier** | An independent electronic library with “no-strings” sponsorship, formerly funded by the UK National Health Service. Offers evidence based summaries and critical analysis of selected articles in about 60 categories. Information comes from systematic reviews, meta-analyses, randomized trials, and from high quality observational studies. There is a special section about pain, the Oxford Pain Site.  
Available from: [http://www.medicine.ox.ac.uk/bandolier/](http://www.medicine.ox.ac.uk/bandolier/) |

| **Best Bets** | Best Evidence Topics (BETs) provide rapid evidence-based answers to clinical questions. BETs are reviewed every 6-12 months. Covers topics in emergency medicine, general medicine, primary care, and pediatrics. BETs were developed in the Emergency Department of Manchester Royal Infirmary, UK.  

| **Evidence Updates** | This is a surveillance service produced by BMJ Group and McMaster University's Health Information Research Unit. It provides access to current best evidence from research, tailored by health care specialists. |
interested, as email alerts or via a searchable database. Topics cover all areas of clinical medicine.

Citations from over 170 premier clinical journals are pre-rated for quality by research staff, then rated for clinical relevance and interest by at least 3 members of a worldwide panel of practicing physicians.

Available from: [http://plus.mcmaster.ca/EvidenceUpdates/](http://plus.mcmaster.ca/EvidenceUpdates/)

### InfoPOems

POEMs (Patient Oriented Evidence that Matters) are one-page synopses of new evidence carefully filtered for relevance to patient care and evaluated for validity. They are available in the Essential Evidence Plus database, and as a daily e-mail delivery sponsored by some medical associations.

### OTHER WEBSITES OR PORTALS

#### Google Scholar

Google Scholar is a widely-used search engine that searches only scholarly literature, including theses, books, abstracts and journal articles. The Google Scholar database is very large, so typically your search results will also be numerous. Google Scholar will retrieve references from PubMed Medline, and from most of the non-commercial resources mentioned in this list.

Available from: [http://scholar.google.ca](http://scholar.google.ca)

#### Dermatology Atlas

DermIS.net is a large dermatology information service which offers elaborate image atlases (DOIA and PeDOIA) including diagnoses and differential diagnoses, case reports and additional information on almost all skin diseases. It is produced by the Dept. of Clinical Social Medicine (Univ. of Heidelberg) and the Dept. of Dermatology (Univ. of Erlangen).

Available from: [http://www.dermis.net/](http://www.dermis.net/)

#### InfoClinique

This search engine facilitates access to multiple sources of scientific health information, in French and English, available in open access on the web, and judged relevant to Canadian health care by Canadian health care professionals. Retrieval is filtered by these categories: Evidence Based Medicine, CPD, Images, Alternative Medicine, Patient Education, Professional Information, Public Health and Textbook. InfoClinique has both French and English search interfaces.

Available from: [http://infoclinique.fmed.ulaval.ca/](http://infoclinique.fmed.ulaval.ca/)

#### LEXI-Comp

A collection of databases predominantly about drug information but also including laboratory tests and diagnostic procedures. In addition to general drug information, LEXI-Comp includes a drug
interaction program, pediatric- and geriatric-specific resources, and poisoning and toxicology information. Available online and for handhelds.

$ Available by subscription and as a benefit of CMA membership.

Available from: http://lexi-comp.com/

**Organization and Association Websites**

Web sites produced by reputable organizations, such as national or provincial medical associations, or disease based organizations like the Canadian Cardiovascular Society or the Canadian Diabetes Association, or the websites of the regulatory authorities, are another resource for finding information.

**RxFiles**

RxFiles is a Canadian academic detailing program providing objective, comparative drug information to physicians, pharmacists and allied health professionals. Their products include a newsletter, and online and print drug comparison chartbooks. Drug therapy topics are selected on basis of their potential to enhance patient care and/or reduce drug costs without altering efficacy and safety. *RxFiles Drug Comparison Charts Book*. 7th ed.; 2008. Standard Edition ISBN: 978-0-9739441-4-3 Pocket Edition ISBN: 978-0-9739441-5-0 $60.00

Available from: http://www.rxfiles.ca/
APPENDIX 2: Conducting a Literature Search

Become familiar with resources

There are many different reasons for searching the literature. On a basic level, you may be looking for background information, or for more patient-focused “foreground” information guided by clinical questions of etiology, diagnosis, therapy, prevention, and harm. (Background and foreground information are discussed more fully in the Users’ Guides listed in Appendix 4.) When doing PEARLS exercises, it is especially important to search for current, evidence-based literature. Appendix 1 categorizes and lists several commonly used evidence-based resources which have different characteristics. They may consist of original research or other work, or they may consist of articles or other works that have been evaluated or appraised in some way – or they may be a combination of the two. Resources may be more or less evidence-based, and it may not always be easy to tell how evidence-based they are. Finally, resources may be large or small, and they may be more or less user-friendly.

Once you have had an opportunity to scan the list, read the annotations, and become familiar with some of the resources, you will develop an understanding of how different resources match up with different reasons for searching. For example, if you are searching for information on a widely used therapy and need strong evidence, you would do well to go to the Cochrane Database of Systematic Reviews to search for a meta-analysis. On the other hand, if you are searching for a more uncommon or complex subject, you might find that a very large database that includes original research articles, like Medline, is the best place to start. Keep in mind that you may have to search more than one resource. Also, remember that you may not be able to find strong evidence for some questions, or there may be no evidence.

Medline

Medline was the original resource available to searchers for evidence-based information, and it is still one of the most useful resources. Medline is a biomedical bibliographic database produced by the US National Library of Medicine (NLM) that consists of approximately 20 million bibliographic records, covering the period from 1966 to the present, with links to the full text of participating journals. It is freely available to anyone with Internet access as the PubMed/Medline database, from http://www.ncbi.nlm.nih.gov/pubmed/. Medline is also available from various commercial providers, for example Ovid, EBSCO, and Medscape, who lease the Medline data from NLM.

NLM is continually adding new features to PubMed/Medline. For example, “cited by” references are now added for some articles. There is a special search algorithm to search for evidence-based articles on diagnosis, therapy, prognosis, and etiology; to use it, click on the Clinical Queries link on PubMed's home page. There are some basic features of this database (and most other bibliographic databases) that are especially useful. These are the use of Boolean logic to search, the use of index terms or subject headings, and the use of limits.
Boolean logic

The search interfaces of almost all bibliographic databases make use of Boolean logic; i.e. the ability to combine the results of several retrieved sets with the Boolean logic terms AND, OR and NOT. In general, searchers combine each component of their questions with the Boolean operator "AND". (For example, [MIGRAINE AND DRUG THERAPY AND ADOLESCENCE.]) If any of the components consists of several choices of equal interest, these terms will be joined by the Boolean operator "OR". For example, if the searcher were interested in several types of headache, the strategy would change to (MIGRAINE OR CLUSTER HEADACHE OR TENSION HEADACHE) AND DRUG THERAPY AND ADOLESCENCE.

It is usually more useful to perform a search with intermediate steps, rather than in one single long search statement as above. Then, if the retrieval is not satisfactory, the searcher still has the "building blocks" of the search to combine in other ways.

MeSH and other subject headings

The Medline database uses a "controlled vocabulary", a standard list of descriptive subject headings, called MeSH (Medical Subject Headings). Indexers at NLM assign about a dozen MeSH terms to each article in the database. This high quality of this indexing allows searchers to have confidence that the same index terms have been assigned to articles that are about the same topic. This in turn allows more comprehensive and consistent retrieval than if searchers had to rely solely on the “natural language” used in the titles and abstracts of references, which can be quite variable. To get the best retrieval from a database search, it is important to use MeSH, (or whatever standard list of subject headings the database uses) whenever possible. A search with MeSH terms that proves unsatisfactory can always be supplemented by doing a natural language or "textword" search.

PubMed/Medline will help by “mapping” words or phrases you use to MeSH terms. Searchers unfamiliar with MeSH terms may also want to search for a word or phrase in the titles of references, checking the MeSH terms that have been used to index “good” articles, then re-searching using the MeSH terms. Good Medline search interfaces allow easy access to MeSH terms for searching.

Limits

Another aid to effective searching, in Medline and other databases, is the appropriate use of limit functions. Because Medline references are indexed in such a detailed way, it is possible to specify retrieval by such factors such as language, year of publication, age of the population studied, or type of article – such as review, meta-analysis, randomized controlled trial, or practice guideline. A good search interface will let searchers limit their retrieval easily to all these and more. PubMed/Medline also has a very useful Subset limit. So, for example, you can limit to the subset “Core Clinical Journals” – the top few hundred major clinical journals including New England Journal of Medicine, JAMA, BMJ, etc.
Practice guidelines

Practice guidelines may be particularly useful when searching for evidence. The resources listed in Appendix 1 are a good place to start looking for guidelines. Some guidelines, but only a relatively small proportion, are published in journals that are indexed in Medline, so you can find them by searching there.

Remember when searching that guidelines are often comprehensive and lengthy, and may have uninformative general titles, like “Management of Type II Diabetes Mellitus”. The particular piece of information you are searching for may be embedded deep within the guideline, and often the only way to find it will be to read through the full text.

Not all guidelines are evidence based. The AGREE (Appraisal of Guidelines Research and Evaluation) instrument, available from http://www.agreecollaboration.org/instrument/, is widely used for rating guidelines. Several of the resources listed in the Practice Guidelines section of Appendix 1 include evaluations of guidelines.

The Search Question

A good literature search begins with a good question. When looking for an answer to a specific clinical problem, it helps to make the question as specific as you can, by identifying the problem or condition, the intervention or exposure of interest, any comparative interventions, and the outcomes of interest. This is often referred to as the PICO approach: Patient or Population of interest, Intervention, Comparative intervention, and Outcome. Several of the resources listed in Appendix 4 have detailed information on formulating a search question.

Systematic Searching

It helps to be systematic when searching. Identify the resource you think will be most productive, and start there. It sometimes is useful to keep a record of your search strategies, when you did the search, and the period your search covered. This is especially necessary if you are searching the literature as the basis for a research project, preparing a review article, or developing a practice guideline. Good records will enable you to update your search easily, and to describe your strategy so that others can replicate it.

Sometimes you need to search many resources to ensure that you have covered all the relevant literature. For example, when preparing a systematic review you would likely search Medline, Embase, the Cochrane Library databases, perhaps one or two other databases, and Google Scholar.
Need Help?

Literature searching, like other skills, improves with practice. Almost all of the online resources offer “help” features and tutorials. PubMed/Medline has excellent help and flash tutorials, accessible from the left hand panel of the PubMed screen. Local hospital and medical libraries may also be able to provide assistance.

The Canadian Library of Family Medicine's Web page http://www.cfpc.ca/clfm offers a convenient set of links to information resources, and an easy way to contact the library service. CLFM staff are always ready to do literature searches with you or for you, and to help with any questions about the biomedical literature.
APPENDIX 3: Canadian Library of Family Medicine Services for CFPC Members

The Canadian Library of Family Medicine (CLFM), the library service of the College of Family Physicians of Canada was established to ensure that all members of the College have access to comprehensive library services, by complementing existing services, and by providing a specialized reference service in family medicine. CLFM is located in the Taylor Library at the University of Western Ontario in London, ON.

**Literature Search**

Search requests on any topic are welcome. Searches on family medicine topics are CLFM’s area of special expertise. CLFM staff use bibliographic databases, book collections, the Internet, and other resources to produce a list of references on the topic requested. In most cases, abstracts will be included with the references.

- Five (5) free searches per year for members; $8.00 per search thereafter

**Document Delivery**

Library staff will send copies of articles and other documents for purposes of personal research or study. Items that CLFM is not able to supply may be ordered from other libraries on request. Copies may be requested by phone, fax, e-mail, or through the CLFM Website.

- 25 free articles per year for members
- Copies mailed: $2.00/article; Copies faxed: $3.50/article
- Articles ordered from other libraries: Cost recovery (usually $10.00-$25.00/item)

**Book Loans**

Books are loaned for three weeks with renewal requests accepted.

- No charge, however borrowers are responsible for return mail or courier costs

**Other Services**

Library staff are happy to help with any questions about information resources, search techniques, information management software, or other topics. Individual or small groups instructional sessions are also available, tailored to your specific needs. No charge for CFPC members.

<table>
<thead>
<tr>
<th>Contact Information: CANADIAN LIBRARY OF FAMILY MEDICINE</th>
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<tbody>
<tr>
<td>Canadian Library of Family Medicine</td>
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<tr>
<td>Rm 106K, Taylor Library, Natural Sciences Centre</td>
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<tr>
<td>University of Western Ontario</td>
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<tr>
<td>London, Ontario N6A 5B7</td>
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APPENDIX 4: Annotated Critical Appraisal References

<table>
<thead>
<tr>
<th>Reference</th>
<th>Title</th>
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<th>Pages</th>
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<tr>
<td>Centre for Evidence-Based Medicine (Oxford, UK)</td>
<td></td>
<td></td>
<td></td>
<td>The CEBM website contains a section with useful tools and downloads for the critical appraisal of medical evidence. Sample appraisal sheets, calculators, and a PC-based software tool which helps you created Critically Appraised Topics, or CATs are some of the offerings. The CEBM’s broad aim is to develop, teach and promote evidence-based health care and provide support and resources to health care professionals to help maintain the highest standards of medicine. Available from: <a href="http://www.cebm.net/">http://www.cebm.net/</a>.</td>
</tr>
<tr>
<td>Crombie I.K.</td>
<td>Pocket guide to critical appraisal.</td>
<td>2nd ed.</td>
<td></td>
<td>A practical accessible handbook which provides a basic introduction to the principles and processes involved in critical appraisal. The 2nd edition has been updated throughout and has two new chapters, on how to appraise qualitative research and economic.</td>
</tr>
<tr>
<td>Dawes M.</td>
<td>Evidence-based practice: a primer for health care professionals</td>
<td>2nd ed.</td>
<td></td>
<td>The book is a comprehensive guide to all the main strands of EBHC - finding and implementing evidence for use in clinical practice. Its focus is health professionals in the primary care field, and it consciously uses case examples from a variety of professional contexts. Examples and questions relevant to primary care practice are featured throughout the text.</td>
</tr>
<tr>
<td>Greenhalgh T.</td>
<td>How to read a paper: the basics of evidence-based medicine</td>
<td>3rd ed.</td>
<td></td>
<td>This easy-to-read text explains the meaning of critical appraisal and terms such as 'numbers needed to treat'. This third edition places more emphasis on patient perspectives, contains increased coverage of qualitative research in evidence-based medicine and also includes new information on literature sources and search mechanisms. Appendices offer checklists for assessing different kinds of articles, and search strategies.</td>
</tr>
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</table>

This book is a summary of the tools that Bandolier uses to assess evidence. It acts as a simple guide for people who wish to make sense of evidence in a healthcare setting and who want to avoid being misled by faulty evidence. It provides practical guidelines on how to make sense of and interpret the evidence that is available, with information on how to avoid straying beyond evidence.


Information mastery is the applied practice of evidence-based medicine. This book uses "Usefulness Equation", whereby the usefulness of information varies directly with the relevance of information and the validity, divided by the work it takes to obtain the information. This text focuses on how to focus on POEMS (Patient Oriented Evidence that Matters), and how to access information quickly and efficiently at the point of care.


This book is short, practical, and fits into a pocket. Its organization follows the steps of evidence based medicine; how to ask answerable clinical questions, how to translate them into effective searches for the best evidence, how to critically appraise that evidence for its validity and importance, and how to integrate it with patients' values and preferences. Plasticized cards in a back pocket give guidelines for critical appraisal and other aids, and there is an accompanying CD-ROM.

**Users' guides to the medical literature**

The Users’ guides started as a series of articles in JAMA in the 1990’s, designed to help physicians provide care based on the best evidence. There are now several versions in other formats.


This comprehensive text covers how to distinguish solid medical evidence from poor medical evidence, devise the best search strategies for each clinical question, critically appraise the literature, and optimally tailor evidence-based medicine for each patient. It focuses on the key issues in evidence-based practice: What are the results? Are the results valid? How do I apply the results to the care of my patients?


This version distills the most clinically-relevant coverage from the parent Users' Guide Manual into a highly-focused, portable resource. Many real-world examples drawn from the medical literature are woven throughout.
### JAMAevidence.com

JAMAevidence.com is a new interactive database for the best practice of evidence based medicine. The site can be user-customized. Features include the Users' Guide Manual, calculators, education guides, and other evidence-based tools and resources.

$ annual subscription

### Centre for Health Evidence

The Centre for Health Evidence maintains the full text of the pre-publication version of the Users’ Guides series on its website, on behalf of the Evidence-Based Medicine Working Group. The Centre for Health Evidence is a not-for-profit organization based at the University of Alberta dedicated to helping health organizations and associations find and apply best evidence in daily practice.

Available from: [http://www.cche.net/](http://www.cche.net/)