

SEARCHING PUBMED

Clinical questions can be mapped onto searches for knowledge resources. . Remember that, in 2005, the ability to search the literature effectively is an important clinical skill. Just as the physician who has learnt how to accurately assess optic disks will make better decisions for her patients with headache, a clinician who can efficiently and effectively access the medical literature on the fly will make better decisions for all their patients.

The best place to find answers to clinical questions is in the pre-appraised resources outlined in the previous module. However, many questions may not have already been “pre-appraised”. As a result, clinicians must often access the primary medical literature directly. In this module, we will show you how to better do this using bibliographic databases.

Objectives

The resident will be able to:

- ? Use PubMed “clinical queries”
- ? Use PubMed “Cubby”
- ? Be aware of EMBASE

Key Concept

There are features of the MEDLINE databases (Pubmed and OVID) that can make searching more efficient and more effective. Note that there is a European equivalent of MEDLINE called EMBASE which is (shock and disbelief) better than Medline for drug trials.

Quicklinks

- ? Pubmed. www.pubmed.org

Unlike OVID, this resource is freely available at any computer that has a Web browser. It has an excellent tutorial available at:

http://www.nlm.nih.gov/bsd/pubmed_tutorial/m2001.html that can show you how to best use it. Make certain that you understand how to use “Boolean Operators”.

- ? PubMed Clinical Queries: http://www.nlm.nih.gov/bsd/pubmed_tutorial/m6009.html

This is a series of filters that takes you query and screens out stuff that is unlikely to be clinically useful. As a clinician, you should use these with EVERY search you use. The link above will show you how to use them.

- ? PubMed myNCBI: <http://www.nlm.nih.gov/bsd/disted/myncbi.html>

Register for myNCBI and you can save your PubMed searches for online access. Free.

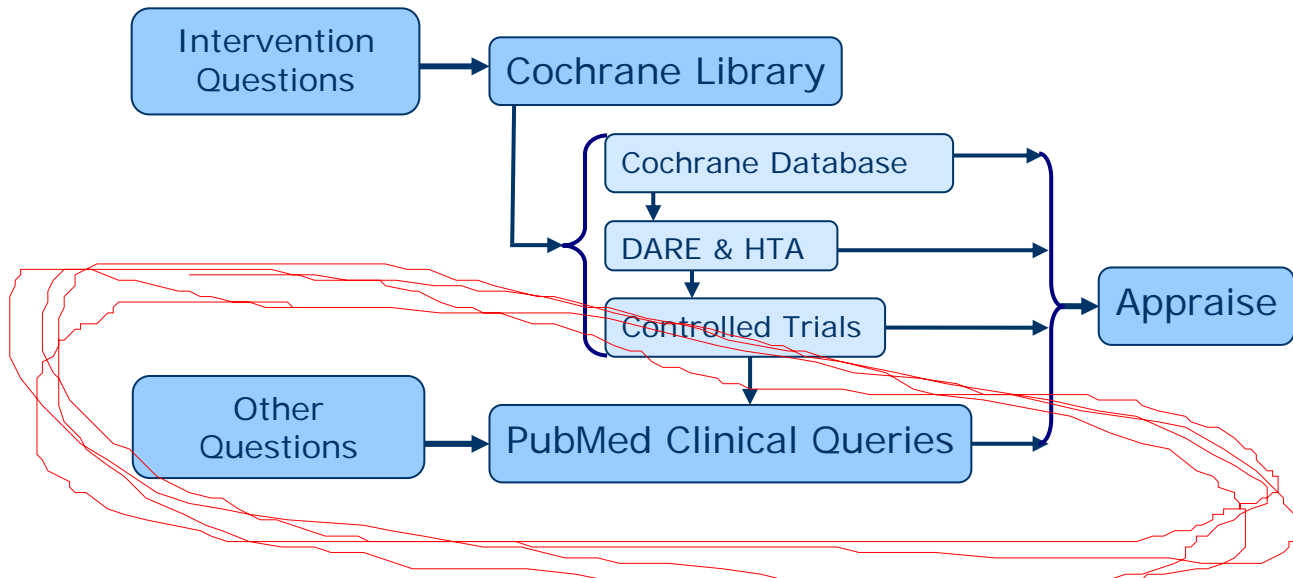
- ? EmBASE: available through the Library Web site

This is essentially the European version of Medline. The overlap between the two is amazingly small – on the order of half. Remember that the majority of drug development and evaluation is done in Europe and medications are released in Europe years before North America. This is therefore an excellent site for information on new drugs.

Where do I go to search?

We suggest that you use The Cochrane Library and PubMed Clinical Queries as your first search options.

These two resources provide high quality information quickly, and they have done some of the work of filtering and appraising for you.



What is The Cochrane Library?

The Cochrane Library is a regularly updated collection of evidence-based practice databases that provide high quality information about health-care **interventions**.

Cochrane Library access for all Australians is funded by the Commonwealth and it is therefore freely available to Australians. You can access it at www.thecochranelibrary.com

What is PubMed Clinical Queries?

PubMed Clinical Queries is a specialised search engine intended for clinicians that has built-in search "filters" designed to find high quality studies. It includes searches designed for four study categories:

therapy, diagnosis, aetiology and prognosis

Clinical Queries can be accessed at www.pubmed.org by clicking on the "Clinical Queries" link on the left hand navigation bar.

There are many other databases to explore too – see page 20 for some more suggestions.

3. Search the literature for relevant articles

How do I search?

Use your PICO question components to identify the search terms that will form the basis of your search strategy.

Remember to consider alternative terms, synonyms and alternative spellings.

	Search Terms	Alternatives
	i.e. Child Salbutamol	Paediatric, pediatric, infant Albuterol, ventolin
Patient		
Intervention		
Comparison		
Outcomes		

To start with, you can search using one of your PICO elements and see how many records you find, and then decide which other PICO elements you will use to restrict your search.

Put an asterisk next to the PICO element you will search with first on the table above. This will depend on your search.

For example, if you are interested in continuous subcutaneous insulin infusion in paediatric diabetes, then just entering diabetes will return too many records to be of use.

On the other hand if you are interested in treatments for canalolithiasis in elderly people with cognitive impairment, just searching for canalolithiasis will probably return a small enough number of articles that you won't need to restrict any further.

Searching tools

To combine search terms we can use the **Boolean operators** "AND" and "OR". These terms affect the way that the database retrieves records.

- **OR will broaden your search** by returning any records that contain either one of your terms e.g. cancer OR neoplasm.
- **AND will restrict your search** by only returning records that contain both terms e.g. stroke AND aspirin.

Truncation: In The Cochrane Library and PubMed you can use an asterisk * to truncate search terms, eg the search term "arter*" will retrieve artery, arteries, arterial, etc.

In other databases you use different symbols (\$ in Ovid, etc)

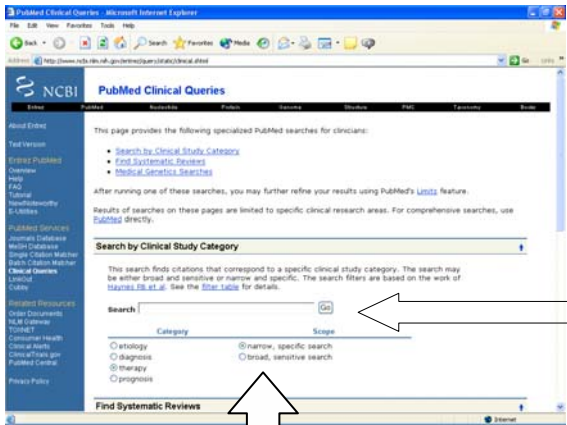
In the box below use "OR" & "AND" to combine your search terms into a search phrase that includes all your PICO elements and their alternatives.

P	
AND	
I	
AND	
C	
AND	
O	

Now we've just got to take this search to the literature – but where to go?

PubMed Clinical Queries

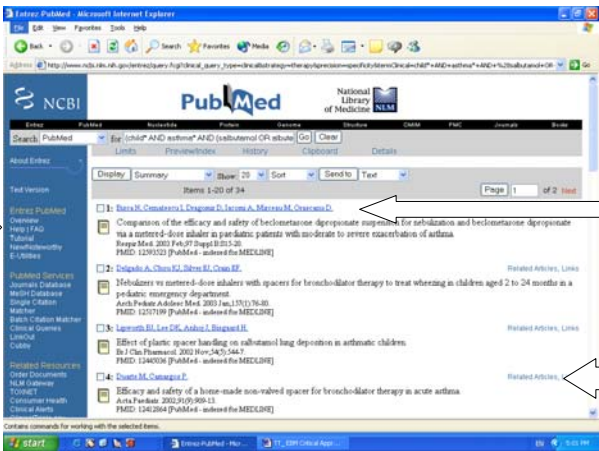
At pubmed.org choose "Clinical Queries" here



Type in your search phrase here and hit click on the "Go" button.

Choose the type of question you are asking, and whether you want a broad (sensitive) or narrow (specific) search

For help with using PubMed click on "Help/FAQ"



Click on the authors of the record to show the details of that record

To see articles similar to one you have found click on "Related Articles"

What are 'Levels of Evidence'?

Levels of Evidence reflect the methodological rigour of studies. A study assigned as Level I Evidence is considered the most rigorous and least susceptible to bias, while a study deemed to be Level IV Evidence is considered the least rigorous and is more susceptible to bias.

Evidence Regarding Interventions and Risk

As defined by "How to use the evidence: assessment and application of scientific evidence" (National Health & Medical Research Council, Canberra, 2000):

Level I	Evidence obtained from a systematic review (or meta-analysis) of all relevant randomised controlled trials.
Level II	Evidence obtained from at least one randomised controlled trial.
Level III	-1 Evidence obtained from pseudo-randomised controlled trials (alternate allocation or some other method).
	-2 Evidence obtained from comparative studies (including systematic reviews of such studies) with concurrent controls and allocation not randomised, cohort studies, case control studies or interrupted time series with a control group.
	-3 Evidence obtained from comparative studies with historical control, two or more single-arm studies or interrupted time series without a parallel control group.
Level IV	Evidence obtained from case series, either post-test or pre-test/post-test.

Evidence Regarding Diagnostic Tests

At present the National Health and Medical Research Council (NHMRC) of Australia does not have a system for assigning a hierarchy of evidence to studies of screening and diagnostic tests. The system below was developed by the staff at CCE³.

Level I	Independent blind comparison of an appropriate spectrum* of consecutive patients, all of whom have undergone both the study test and the reference standard.
Level II	Independent, blind or objective comparison but in a set of non-consecutive patients, or confined to a narrow spectrum of study individuals (or both), all of whom have undergone both the study test and the reference standard.
Level III	Independent blind comparison of an appropriate spectrum, but the reference standard was not applied to all study patients.
Level IV	Any of: reference standard was not applied blinded or not applied independently, no reference test applied (case series).

* An appropriate spectrum is a cohort of patients who would normally be tested for the target disorder. An inappropriate spectrum compares patients already known to have the disease with patients diagnosed with another condition, or with a separate group of normal patients (case-control).

³ Johnston RV, Burrows E, Rauli A. Assessment of diagnostic tests to inform policy decisions--visual electrodiagnosis. *Int J Technol Assess Health Care*. 2003;9(2):373-83.