Evidence-based medicine - searching the medical literature. Part 2

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In the last issue I covered the use of PubMed to retrieve *primary sources* of evidence (individual research studies). However, if you need quick or more definite answers to your clinical questions you may prefer to start with *secondary sources* - where individual studies have already undergone analysis and have often been compared with others to provide a summarised, more definitive conclusion. In Figure 1 this is referred to as *'filtered information'*, although of course individual studies published in journals will often have been peer reviewed before publication, so have undergone a basic level of filtering.

As explained by Dr Hakim in the editorial of Southern Sudan Medical Journal 3(1) there is an agreed hierarchy of 'levels of evidence', those nearer the top in Figure 1 are likely to provide the most reliable evidence - and it is these that we will concentrate on here.
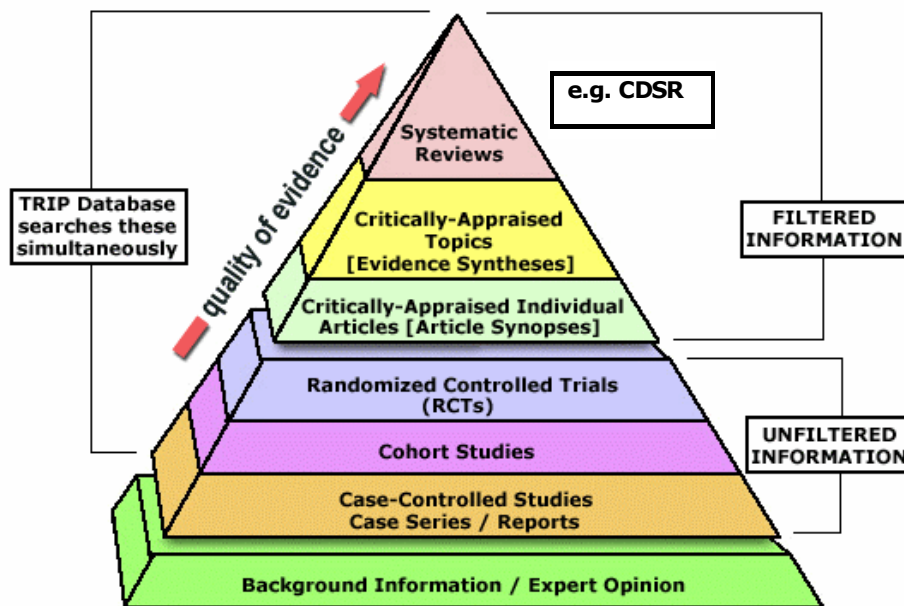

Figure 1. Hierarchy of levels of evidence (Source: www.ebmpyramid.org/samples/complicated.html)

The Cochrane Database of Systematic Reviews (CDSR)

CDSR is one of several databases within The Cochrane Library, found at www.thecochranelibrary.com. The Full Text version is available to those eligible through HINARI[1] or ISAP[2]. Alternatively everyone can access free Summaries via www2.cochrane.org/reviews/ but searching on this view is not as successful. The Cochrane Reviews are only available via the websites above, they are not published anywhere in print, so if you come across a reference to one (e.g. from PubMed), you will have to search here for the full text.

The Cochrane Reviews aim to:
▪ investigate the effects of interventions on prevention, treatment and rehabilitation or
▪ assess the accuracy of diagnostic tests for particular conditions and for specific patient groups.

Although the Cochrane Collaboration is based in York, UK, the researchers are truly international and aim for global coverage and inclusion of issues relevant to all countries and contexts. As the CDSR title indicates, reviews in this database adhere to a strict and rigorous 'protocol' set out for how the research articles are found, reviewed (critiqued/appraised) and the results calculated. This means all are done by the same *systematic* method to remove bias and ensure the quality of reviewing is maintained. This is not necessarily the case with reviews from other organisations or authors.

About 4,000 Cochrane Reviews are completed and another 2,000 are in progress (labelled 'Protocols') – but progress can be slow as most reviewers are volunteers. Therefore it is best to ignore or filter out the Protocols (marked with light blue) when searching.

The other limitation on finding a Cochrane Review is that they only review *controlled trials* - so any subject where this is not a suitable methodology is not included. To see a list of subjects covered browse by topic/Cochrane Group. [If you are in the Full Text version the topics should be listed on the left-hand side of the screen, if looking at the free Summaries click By Topic, then for sub-topics click here].

Instead of searching through the topics you can enter a key word in the search box. This is the best way to search on the Full Text version. But it is not so useful on the free Summaries website where you get many repeat hits. If you use a phrase enter it within quotation marks e.g. "breast feeding". This is good practice in all website searches to avoid the two words being found independently of each other. If you put in more than one word the results will be Reviews with both words included somewhere, but in any keyword search there will be quite a few false hits. However it is usually easy to skim down the results titles quickly to pick out relevant ones.

> *Note:* if you are using the Full Text version of CDSR make sure that you have some hits beside the Cochrane Reviews heading in the top panel of the screen. If there have been no hits the results listed will be from one of the other databases, and not be Cochrane Reviews.

Results will be listed in 'best match' order, but there are options to change to 'date' or 'alphabetical' order at the top of the list on the right-hand side. Changing to Date order will display the most recent first. However it is important to check the dates of each Review very carefully as they give two dates - one when that version was published online, and one when the content was last reviewed as being up-to-date, and these may be very different. Some Reviews will indicate that they have been withdrawn, although still showing on your hitlist.

Whether in the Summaries or the Full Text version, click on the Review's title to see the abstract. This gives:
- The type of review (e.g. Intervention) title.
- Authors and their contacts.
- The Cochrane Group it is part of.
- Date of publication.
- Date of currency review.

The citation is also written out. Copy this exactly when referencing the Review in any context - numbers and all!

Moving down the abstract you will note that the 'method' section explains how the literature search was done (search strategy) and the criteria by which papers were included in the Review. It is vital for a rigorous systematic review that all published and unpublished studies are included, so database searches and hand searches of journals will have been done, plus following up contacts. Each individual research paper will then have been critically appraised for the quality of study design and how it was carried out, against the agreed Cochrane set protocols.

The 'results' section will give an overview of how many of the trials met the strict inclusion criteria (others having been rejected), and the outcome of *meta-analysis* of the data. A meta-analysis is a way of combining data from more than one trial to calculate a statistic of net overall benefit of the treatment or intervention[3]

The 'conclusion' is then stated giving a balanced and impartial summary of effectiveness based on all existing research. Sometimes insufficient data will have been found to come to a conclusion. So there is usually a further conclusion that more research is needed.

Using the Full Text view there is a clickable index of the contents of the paper on the left-hand panel, or the option to show the Review in pdf. As mentioned above, the 'method' section is about the literature review and the 'results' section gives details of why each paper was included or rejected.

> *Beware:* many of the Reviews are more than 20 pages long, plus additional tables and charts. So do not press the print button before thinking!

To print just the sections you need (e.g. abstract, background, discussion, conclusions, references) either:
- Choose the pages from the pdf version or
- Highlight sections with your mouse and use file/print/selection (as with printing from any website).

Note that the references listed first are those of studies *included* followed by those rejected.

More detailed 'advanced' searching, saving searches etc. is possible on the Full Text view (see the top right-hand corner), but usually the simple searching with keywords or by topic is sufficient.

Other sources of secondary evidence

There are many other sources of summarised and reviewed literature. All aim to give quick and easy answers to common clinical questions from a single search site. As indicated in Figure 1 some of these (such as TRIP)

include references to secondary evidence such as the Cochrane Reviews together with primary studies and other literature. There are usually filters on the screen to choose which type of information you require. Simple keyword searching is all you need - but remember those "quotation marks" for phrases and the wildcard/truncation symbol * to get any ending on the stem of a word e.g. surg* (for surgery, surgical - but possibly getting unwanted surging, surged, etc.).

Freely available
- **TRIP** (Turning Evidence into Practice) www.tripdatabase.com - note the new tick box at the bottom of the filter column on the right to limit to items directly relevant to developing countries.
- **NHS Evidence** www.evidence.nhs.uk - parts of this are restricted, but much of the information is freely available.
- **Bandolier** www.medicine.ox.ac.uk/bandolier/knowledge.html.
- **Intute** www.intute.ac.uk - this has some reviews and articles amongst other more varied web resources. If you have a good internet connection there is also a useful 'virtual training suite' giving further guidance in web searching for medical information and training resources.

Via HINARI
- **Best Practice** bestpractice.bmj.com.
- **Clinical Evidence** www.clinicalevidence.bmj.com

and much more…

More local evidence
For a more local flavour try these free resources - both give primary research and some reviews:
- **AIM** (African Index Medicus) - an African equivalent of PubMed indexmedicus.afro.who.int abstracts and some full text available. Click Database on the left-hand panel.
- **AJOL** (African Journals Online) http://ajol.info/   - abstracts and 3 free full text articles per month - use the search box on the top right, or Browse the Journals by topic, country or alphabetically.

So, there is lots of good quality evidence available to apply to your practice… Obviously secondary evidence will not be available to answer all your questions, but if it is then it will be more reliable than one individual study. Happy searching!

Notes
1. HINARI (Access to Research Initiative) provides free or very low cost online access to the major journals in biomedical and related social sciences to local, not-for-profit institutions in developing countries (including Southern Sudan). www.who.int/hinari/about/en
2. ISASP (International Network for the Availability of Scientific Publications) see this link for more detail about availability in Sudanwww.inasp.info/file/c09571fe8890329e7f72f9e2436f1079/Sudan.html?country=700a088657db6c6153375b7fa8c05836
3. For more information on meta-analysis see www.medicine.ox.ac.uk/bandolier/painres/download/whatis/Meta-An.pdf