Conducting a literature search using RCS library resources

Defining your question

There are many ways to refine your research question. We tend to use the PICO or PICOT method which is good for clinical questions. You may recognise it from the sections on our literature search request form.

PICO(T) stands for the following:

> **Population**
>
> **Intervention**
>
> **Comparison**
>
> **Outcome**
>
> **Time**

Not all searches will have all aspects of PICO, for example you may not be interested in comparators. However, it is a useful way to define what you are looking for and will help in developing your search strategy.

Leeds Institute of Health Sciences has a good list of alternatives to PICO based on the type of research being conducted - https://medhealth.leeds.ac.uk/info/639/information_specialists/1500/search_concept_tools

Accessing the databases:

1. Go to the RCS website www.rcseng.ac.uk and log in to the website

2. Search 'Databases'

3. Click the first result 'Databases' and then Ovid Medline.

4. Click 'Continue' on the page that opens.

Choosing a database:

We usually recommend conducting your search on both Medline and EMBASE; however we would do these searches separately because they use separate thesauri and sometimes search terms do not translate.

We normally start with Medline and choose the first option under the Medline heading 1946 to present, as this is the most comprehensive option. You can choose other options depending on the literature you are searching for.

Select your choice and click OK.

Developing your search

Now you will have your search query written up in PICO form and you have picked your database. The next thing to do is develop your search.

Subject Headings

One of the most important things to remember when using the databases is that the content is tagged with very specific controlled vocabulary in the form of subject headings. When you search using subject headings you are searching for matching content rather than searching through the text.

Medline uses MeSH (Medical Subject Headings). MeSH is very easy to use because you can use the online MeSH Browser https://meshb.nlm.nih.gov/search to scope your subject headings before going to the database.

EMBASE uses Emtree which doesn't have a stand alone browser but you can use the database to search through Emtree and its hierarchies. You can do this by selecting the Embase database and clicking the option for Search Tools. You will see that it says 'Map Term', change this to Thesaurus and you will be able to see variations and the hierarchies for Emtree.

N.B. These thesauri use American spelling, so paediatrics will not map to a subject heading, paediatrics will.

Snowballing

Snowballing is an effective way of identifying further keywords and synonyms for your search. If on a database you find an article that is perfectly matched to your search criteria, then look at the bibliographic details for that article and note what indexed terms have been assigned to it. This will often give you ideas of further keywords/subjects headings to include in your search.

Focus/Explode

You can choose to Focus or Explode your subject headings. Focusing means that it will map to articles that have the subject heading as a major topic. It is a good way of narrowing your search. By choosing the Explode function you will include the term and all terms under it in the hierarchy. This is a good way to broaden your search.

Keyword Searching

Keywords describe subject areas. Having a good set of keywords will help to minimise the number of irrelevant returns. Keyword searching can be particularly useful when combined with truncation and other useful advanced search functions.

The most useful ones are:

Truncation: The asterisk * is used by these databases to truncate. By searching paediatr*, you will bring back results for paediatricians, paediatric, paediatrics and all other possible endings.

Wildcard: The question mark ? is used by these databases as a wildcard. The wildcard is used to replace 0 or 1 character either at the end or inside a word. Using the example above we could search p?ediatric to bring back paediatric, or pediatric? to bring back pediatrics.

We could use both the * and ? to bring back all variations e.g. p?ediatr*

Adjacent to: Using the word 'adj' is an effective way of searching which allows you to pick up items where two words are near to each other in any order. You can specify how near or far from each other your want the words to be. For example: The search (DCIS adj3 radiotherapy) will return results in which the two words are within three words of each other.

To use the adjacent function use the feature adj within your search followed by the number of words you wish to limit it by.

Phrase searching

Using quotes around search words allows searching them as phrases. For example "plastic surgery".

Limits

It can be useful to limit to search fields, especially when you are using keyword searching. We tend to use the limits for title and abstract most often as it is most likely that the results will be of relevance to your search if your keyword appears in these sections.

To search for your keyword within the title you can use .ti, to search for your keyword within the abstract you can use .ab. You can also use both together. For example p?ediatr*.ti,ab will bring back results for anything that has any of your above variations in the title or abstract only.

There are many limits you can use, for example if you are looking for all the work by a specific author, you could use .au. Also think about:

- Publication date: How far back do you want to search? Some databases go back to 1946, but you might only want information going back to the last 10 years.

- Age: Are you looking for information related to a certain age range? For example: infant, adult, adolescent.

- Material type: What type of material are you hoping to retrieve? Are you specifically looking for: articles, RCTs, websites, statistics or grey literature?

- Language: Do you only want to retrieve articles written in the English language?

- Country of origin: Are you looking for UK only based information?

To see the full list of limits go to the database and click 'Search Fields' which will be located above the search box. More filters will appear on the left-hand side of your search results once you have completed a search.

Outlining your search terms

Now that you understand the different ways you can search, it is useful for you to have a record of all your different search terms and how they fit together. Here in the library we use the following table to map out our possible search terms:

	P	I	C	O
MESH/Emtree				
Synonyms (words that might be useful to keyword search)				
Other items to consider: e.g. truncation/wildcards etc				
Notes				

Running your search

Now that you have worked out your search terms and know what concepts need to work together you can start building your search in the database. This is when it is important to understand Boolean operators AND, OR and NOT:

- AND retrieves documents which include both search terms. For example: autograft AND allograft - articles will contain both terms.
- OR focuses the search to retrieve documents which include either one or both of the search terms. For example: autograft OR allograft - articles will contain either or both terms.
- NOT retrieves documents that include the first term but eliminate the term after it. For example: autograft NOT allograft - articles will contain the first term but not the second. (Be careful when you use NOT because the term you do want may be present in documents that also contain the term you wish to avoid).

Medline and Embase feature inbuilt AND/OR limits which allow you to combine concepts. A similar result can also be achieved by placing brackets around sets of search terms. To find articles about bariatric surgery and obesity, we could just search using these terms. However, it is likely that some articles would use synonyms, requiring a search strategy using brackets: ("bariatric surgery" AND (obesity OR weight)).

Your search should now bring back a result set which is relevant to your research question. From here, you can use these findings to inform practice, publications, and systematic reviews, as well as many more practical and academic applications.

Useful resources

Information Skills for Health:
https://infoskillsforhealth.blogspot.co.uk/search/label/Literature%20Search

Medical literature searching skills: http://learntech.physiol.ox.ac.uk/librarytutorials/toc.php

Searching healthcare databases using Ovid:
http://library.sgul.ac.uk/images/helpsheets/User%20Helpsheets/Searching_healthcare_data
bases_using_Ovid_v13.pdf

Email library@rcseng.ac.uk for further help.