Advanced database searching
Medline & CINAHL

Evidence-Based Practice process

1. Ask  Convert your information needs into an answerable clinical question

2. Acquire  Find the best evidence to answer your clinical question

3. Appraise  Critically appraise the evidence for its validity, impact and applicability

4. Apply  Integrate the evidence with clinical expertise, the patient's values and circumstances, and information from the practice context

5. Assess  Evaluate the effectiveness & efficiency with which steps 1-4 were carried out and think about ways to improve your performance of them next time.

PICO Concept Maps

- For clinical questions, PICO helps to formulate the search strategy:
  - Population/Problem
  - Intervention
  - Comparative Intervention
  - Outcome

- For qualitative questions, try SPIDER:
  - Sample
  - Phenomenon of Interest
  - Design
  - Evaluation
  - Research type

Example question

Does **strength training** reduce **pain** in patients with **osteoarthritis**?

<table>
<thead>
<tr>
<th>Population/Problem</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with osteoarthritis</td>
<td>Strength training</td>
<td>No strength training</td>
<td>Reduce pain</td>
</tr>
</tbody>
</table>
Not all questions include all the column types in the grids, and sometimes even if they are all filled in, not all concepts are necessarily searched. PICO is a way to define your research question.

Various limits can be applied at the end of the search to refine by age group, year of publication, language, etc

You now need to convert your PICO concept map into an effective search strategy by using some of the following search tips:

**Search techniques**

<table>
<thead>
<tr>
<th>Search tips</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms (think of alternative terms and separate them with an OR)</td>
<td>Osteoarthritis OR &quot;degenerative arthritis&quot; OR osteoarthrosis</td>
</tr>
<tr>
<td></td>
<td>You may wish to refer to a dictionary or thesaurus for ideas. Use the scope note in Medline, Embase, etc.</td>
</tr>
<tr>
<td>Phrase searching (use double quotation marks around 2 or more words = “ “)</td>
<td>“resistance training”</td>
</tr>
<tr>
<td>Truncation (asterisk symbol = *)</td>
<td>Searches for variant endings of the truncated term</td>
</tr>
<tr>
<td></td>
<td>rehabilitat* will find rehabilitate/s, rehabilitated or rehabilitation</td>
</tr>
<tr>
<td>Wildcard (used to search for alternative spellings. Symbol varies depending on database)</td>
<td>Randomi?ed will find randomised and randomized</td>
</tr>
<tr>
<td>Linking terms (Boolean operators)</td>
<td><strong>AND</strong> finds records that contain BOTH terms</td>
</tr>
<tr>
<td></td>
<td>e.g., &quot;back pain&quot; AND exercis*</td>
</tr>
<tr>
<td></td>
<td><strong>OR</strong> finds records that contain ANY of the terms, e.g., “back pain” OR “back ache”</td>
</tr>
</tbody>
</table>

Our final PICO concept map could look something like:

```
<table>
<thead>
<tr>
<th>Population/Problem</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteoarthritis* OR</td>
<td>“Strength training” OR</td>
<td>n/a</td>
<td>pain</td>
</tr>
<tr>
<td>“degenerative arthritis”</td>
<td>“resistance training”</td>
<td></td>
<td>OR ache*</td>
</tr>
</tbody>
</table>
```

Systematic Search: Uses both Subject Headings & Keywords

- In order to find the best available evidence, a comprehensive and systematic search process is required.

- This type of search involves using both subject headings and keywords:
  - **Subject headings** describe the content of each item in a database. Medline & CINAHL (amongst others) use a thesaurus to enable more targeted searching. In Medline, these subject headings are called Medical Subject Headings (MeSH); CINAHL uses a combination of MeSH and their own subject headings.
  - **Keyword searching** is how you search the web or use Library Search. This is a broad way of searching in which you will retrieve records which mention your keywords.

<table>
<thead>
<tr>
<th>Subject Heading Searching</th>
<th>Keyword Searching</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEDLINE &amp; CINAHL (amongst others) are indexed by subject experts who assign a subject heading (or ‘tag’) that best describes the article. These subject headings are from a fixed list of terms that are arranged in a hierarchical structure that show the relationships between terms. This allows searching at various levels of specificity.</td>
<td>Words not taken from a specific list. Can use words that you would normally use when searching. Need to account for variations for spelling, terminology &amp; clinical descriptions.</td>
</tr>
<tr>
<td>More efficient &amp; precise way of searching where you retrieve only those records which list the subject heading for your concept.</td>
<td>Broader way of searching where you will retrieve records which mention your keywords but may or may not be specifically about your concept.</td>
</tr>
<tr>
<td>Searches only the subject field.</td>
<td>Searches words used by the author in other fields such as the title or abstract.</td>
</tr>
<tr>
<td>Provides consistency in the description of the content of the articles.</td>
<td>Useful for searching for a specific term or phrase when there is not an appropriate subject heading.</td>
</tr>
<tr>
<td>Do not need to think of synonyms for your topic.</td>
<td>Useful for searching topics that use new concepts or terminology (subject headings take a while to be developed)</td>
</tr>
</tbody>
</table>

**Database terms explained**

- **Scope Notes**: provides a brief definition of the subject heading
• **Explode:** many subject headings can be broken down into more specific terms. Select ‘Explode’ to retrieve the term plus all of its more specific terms.

• **Subheadings:** will narrow your search to a specific aspect. Use with care as it will often exclude relevant results.

**Medline**

**Example of Medline citation**

MeSH terms are applied by specially trained indexers with a clinical background. A journal article will be indexed with a relevant MeSH term even if that word does not actually appear in the article.

Tip: Find one good article and see how it is indexed i.e. what subject headings are used? If any look promising, incorporate the terms into your search.

**OVID Medline**

1. Search your **P** concept via the subject heading method:

   • Type one word from your **P** concept into the search box with ‘**map term to subject heading**’ ticked *(don’t use truncation or quotation marks when searching for subject*
headings)

- If there is a relevant subject heading tick it, explode, include all subheadings and continue.
- If not go to step 2.

2 Search your P concept via the keyword method:

- Type all the keywords from your P concept with OR in between using truncation * for alternate endings and phrase searching “ ” around two words or more

3 Combine both searches for P into one set:

- Tick rows 1 & 2
- Select ‘Combine Selections with Or’

4 Repeat Steps 1, 2 & 3 for the your I and O concepts

5 Once you have finished creating sets for each concept, select the searches you want to combine. In this example it would be rows 3, 6 & 9, then click on ‘Combine selections with: And’

If you cannot see all the steps of your search strategy, click the red ‘Expand’ button to the right of the search history box.

Limits & Additional Limits

Select ‘Additional Limits’ to refine your research further if required, e.g. publication year, age group, publication type, gender, etc.

Limits will be applied to the most recent search.

Your final search could look like this (this is just an example, there may be more terms you could use):
Save your search

Click on the **Save Search History** button.

You will need to log into your account or create an account if one has not already been created. You can then name your search and save it as a permanent search. Instructions on saving your Search History are located under the Help link located on the top right hand side of the screen.

Email/Print/Export search results

Select relevant articles and click on either print or email – the Search History can also be included. You can also export search results into citation managers such as EndNote, or to formatted files such as PDF, Excel, etc.
CINAHL

1. Tick ‘suggest subject terms’ and type in your P concept.

2. If you find a match, tick the term and select explode if available.

3. Click on Search Database.

4. Untick ‘suggest subject terms’ and search all the keyword terms for that concept with OR in-between if more than one keyword.

5. Tick, S1, S2 and click on Search with OR.

6. Do the same for your I & O concepts.

7. Once you have finished creating sets for each concept, tick the relevant sets (ie. S3, S6 & S9) and ‘Search with AND’.

Limits can be applied to your results by clicking on ‘Show More’ under ‘Refine results’ located on the left hand side of the screen. This opens up all the available Limits such as language, age group, date range, publication types etc.

Saving your results

When you have a personal account you have your own personal area (or folder) to collect and store information. All items you save to your personal folder remain in your folder until you remove them.
• **To add one item:** Click the folder icon next to the article title.

• **To add all items on a page to your folder:** Click the ‘Share’ link and then click Results (1-50) link at the top of the menu. You will have to do the same for the next page.

• Once you have finished selecting your records, click ‘Folder’ in the top right hand of the screen

• The folder will display a list of citations you have selected. You can then print, email, export to EndNote, etc

**Search Tips/Help**

• This method of searching also applies to OVID Embase, PsychINFO & AMED.

• Instructions and online tutorials also available in Health Databases LibGuide: [latrobe.libguides.com/healthdatabases](http://latrobe.libguides.com/healthdatabases)


• Evidence Based Practice in Health: [latrobe.libguides.com/ebp](http://latrobe.libguides.com/ebp)