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Introduction

For higher degree, or postgraduate searching, you’ll be performing mini searches to test each individual term and sometimes combinations of terms in order to find the best words for your final search. Eventually you will discard all of these test searches and construct a comprehensive search using the lists of terms you have included in the logic grid in your Word document. Unfortunately a search done in one database cannot simply be copied and pasted into another. Although there may be many similarities, field names and abbreviations will be different, the indexing languages are different, and the user interface will sometimes require a different method.

WARNING:–

To search PubMed effectively you need to look for words in a variety of fields, and every term in your search MUST include a field name.

In high level searching, where you need control over the elements of your search, “mapping” creates serious problems, as the database then takes over your search and interprets it according to its algorithm.

If you don’t specify field names for each component of your search, PubMed will "map" your term to what its algorithm considers appropriate.

For example, searching posttraumatic stress (without a field name) will give the following result

  posttraumatic[All Fields] AND ("Stress"[Journal] OR "stress"[All Fields])

This will mean that

- you will have lost control of the way your search works
- the results will certainly not be what you intended – at times they may be bizarre
- the search results will reflect not what you searched, but PubMed’s interpretation of your search
- your search will not be acceptable as the basis for a research paper
- your search will not be acceptable as the basis for a systematic review
PubMed Useful Tips

- When you get to the PubMed home page right click on the MeSH Database link and open it in a new tab - this will allow you to have MeSH open in one tab, and PubMed open in the other. That way it’s easy to move between looking up terms and testing searches.

- Look in the Search Details box (right hand side of the search screen) to see how PubMed has interpreted your search.

- Click on the Title of an article to see MeSH terms used to index it.

- Enclose all MeSH in quotes when searching – this will stop mapping, and ensure that your search works as you intend it to.

- Use the Entry terms lists in MeSH to find words to search in titles and abstracts - remember MeSH alone will not produce a comprehensive search, and at times the concept you’re dealing with may not even have an appropriate MeSH term.

- Remember that PubMed “explodes” all MeSH terms automatically to search more specific subcategories. Always check MeSH headings to see the lists of more specific terms.

- Use truncation (*) ONLY for words in titles or abstracts. DO NOT TRUNCATE MeSH TERMS.

- When searching for nursing material in PubMed you need to be aware of the following options.

  **First level – limited retrieval**
  
  Nursing[mh] OR Nurses[mh] OR nursing[sh] OR nurs*[tiab]

  **Second level – extended retrieval**
  
  nurse[tw] OR nurses[tw] OR nursing[tw] OR jsubsetn[text]

  **Third level – comprehensive retrieval**
  
  nurs*[tw] OR jsubsetn[text]

  Be aware that nurs* will also retrieve irrelevant words e.g. “nursery”

    **Jsubsetn[text]**
    
    This is the nursing Journal/Citation subset available in PubMed. Journal/Citation subsets restrict retrieval to specialized journals or articles on specialized topics in other journals.

- Add limits (such as English language, age, or date limits) only when you have completed your search.
PubMed Field Codes

When searching either PubMed it’s important to tell the database where to look for words - titles of articles, abstracts, the indexing language of the database. To do this you need to use field codes. They will make a great difference to the effectiveness of your search!

PubMed has a wide range of field codes, but those you’re most likely to use are:-

- **[mh]** to search for Mesh terms  
  e.g. "neoplasms"[mh]  
  This search will include not only the term Neoplasms, but all of the more specific terms in the list below it. This is called "exploding terms, and is PubMed's default setting.

- **[mh:noexp]** if you don't want to explode the search term  
  e.g. "neoplasms"[mh:noexp]  
  This will search only for the term Neoplasms, not the more specific terms in the list below it

- **[majr]** to restrict your search to major indexing terms only  
  e.g. "neoplasms"[majr]

**NOTE: All MeSH should be enclosed in quotes, whether single words or phrases**

- **[sh]** MeSH Subheadings are used with MeSH terms to help describe more completely a particular aspect of a subject - for example neoplasms/diagnosis. PubMed allows you to “free float” subheadings, and this can be a useful option.  
  e.g. diagnosis[sh]

- **[ti]** to search for words in titles of articles - this is useful for testing components of a search to see how they will work  
  e.g. cancer*[ti]

- **[tiab]** to search for words in titles and abstracts - this is essential for searching the most recent literature  
  e.g. neoplasm*[tiab]

- **[tw]** Includes all words and numbers in the title, abstract, MeSH terms, MeSH Subheadings, Publication Types, Substance Names, Personal Name as Subject, Corporate Author, Secondary Source, and Other Terms.  
  Preferred over [tiab] for systematic reviews.

**Note: If you search using [tw] you will find any MeSH term containing the word or phrase, but MeSH terms will NOT be exploded!**

This will mean you also have to search the MeSH term [mh] if you want to capture the explosion.

- **[all]** Untagged terms and terms tagged with [all fields] are processed using Automatic Term Mapping.  
  Terms that do not map are searched in all search fields except for Place of Publication and Transliterated Title.

**Note: Terms enclosed in double quotes or truncated will be searched in all fields and not processed using automatic term mapping.**

- **[ta]** to search for (Medline) journal title abbreviations  
  e.g. Oncol Nurs Forum[ta]
Language Part 1 – Looking for MeSH

Your most important task at this stage is to create a Word document in which you will gradually build an accurate map of your search strategy. To do this you'll use a table, or logic grid, and simply add words to the appropriate columns as you go.

You'll be performing mini searches to test various terms and combinations in order to find the best words for your final search. Eventually you will discard all of these searches and construct a comprehensive search using the lists of terms you have created in your Word document.

PubMed has a thesaurus called MeSH - which is simply an acronym for Medical Subject Headings. This is the indexing language of Medline. Indexers select terms from the MeSH thesaurus, and attach them to articles to describe their subject content.

1. Open a Word document and set up a logic grid - you'll need a column for each concept. In this example there are three. Column one will contain words relating to cancer, column two will contain words relating to fatigue, and column three will contain words relating to nursing.

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Fatigue</th>
<th>Nursing</th>
</tr>
</thead>
</table>

2. Open two web page tabs or browser windows – one for PubMed, and one for MeSH (there’s a link to the MeSH database on the right of the PubMed home page – just right click and open it in a new tab).

3. Look up cancer as a MeSH

You'll find that MeSH uses Neoplasms rather than the term cancer.

4. Click on Neoplasms and you'll go to a page with additional information.

5. Scroll down until you see Neoplasms in bold type. Under Neoplasms you'll see a huge indented list of more specific subcategories. If you want to search all categories it's very easy, as PubMed's default is to do what's called exploding MeSH terms, and it will search all of the terms in the indented list of neoplasms - much easier than typing them into your search one by one!!

6. Scroll back up, and near the top of the MeSH page for Neoplasms you'll see a list of Entry Terms.

Entry Terms are NOT MeSH. They are synonyms or alternative terms that have been rejected for MeSH.
If indexers see these terms in abstracts or titles or authors’ keywords, then they apply the appropriate MeSH – in this case it would be Neoplasms. However Entry Terms are a useful starting point for finding synonyms, or alternative terms that you could search in the abstracts and titles of articles. However you’ll find that inverted terms in the list are not worth searching - e.g. neoplasms, digestive system

7. Look up **fatigue** in MeSH

8. Scroll down the MeSH page to look at the **Entry Terms**.

![Entry Terms: Lassitude](image)

Remember - these Entry Terms are NOT MeSH!

For example if an author had referred to lassitude in cancer patients, the indexers would have attached the MeSH – “Fatigue” to the record for the article. You could, however, search lassitude in titles and abstracts to find additional articles.

9. Look up **nursing** as a MeSH. Nursing also has a list of more specific categories which will be searched

10. Now update your logic grid with the MeSH terms you’ve chosen

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Fatigue</th>
<th>Nursing</th>
</tr>
</thead>
</table>

Make sure you always enclose MeSH in quotes

![SHOW ME WHY](image)

11. It is often useful to look at a number of articles to see if different MeSH are used – for example there is a MeSH cancer care facilities, and this might also be relevant to your search

12. Simply click on the title of the article you want to investigate. This will display the article details, plus its abstract, and a link to allow you to view its MeSH Terms

The example I have chosen is “Fatigue in patients with advanced cancer”, but you would be wise to choose a number of articles to see if the same indexing terms appeared in each one.

**Fatigue in patients with advanced cancer**
Hawthorn M.
PMID: 21135786 [PubMed - indexed for MEDLINE]

and the indexing is
The terms of interest from this list are those concerning **neoplasms** and those concerning **fatigue**.

Terms with an asterisk after them are Major terms, and represent the most important subject aspects of the article. Those without an asterisk are Minor terms, and represent less important aspects of the article's content.

**NOTE the asterisk here is NOT a wildcard.**

Some of the indexing terms in this example have subheadings - for example /prevention & control, but in this search we will not be using subheadings.

**Warning:** - When searching, using subheadings attached to individual terms is very risky, as indexing at this level is rather variable. There are other, safer ways to include subheadings in your search – see PubMed Fields ([tw] or [sh]

### Language Part 2 - looking for words in other fields

PubMed contains many thousands of new articles waiting to be indexed with MeSH, and the only way to search this material is by looking for words in titles and abstracts, or authors’ keywords.

Very new unindexed material used to be labelled, but unfortunately this is no longer the case.

Even when articles have been indexed, title and abstract searching is useful, as indexers quite often vary in the way they interpret the content of an article.

1. Use lists of **Entry Terms** from MeSH to give you ideas for synonymous words and phrases to search in titles or abstracts - you will probably think of additional possibilities.

2. Check titles and abstracts of articles from your initial search for additional synonyms and other alternative words or phrases to add to your search.

3. Add these terms to the logic grid - the list below is not intended to be comprehensive, but will give you an idea of how to build a search. If phrases are to be searched in titles and abstracts, most databases use inverted commas to enclose the phrase, and ensure that words are not searched independently. PubMed does not require this. However remember that all MeSH must be enclosed in quotes, even if only a single word is involved.

4. As I want my search to be very broad I’ve used Textword [tw] instead of Titles and Abstracts [tiab] in my logic grid. Textword searching will include titles and abstracts, but will also cover additional fields.
### Logic

When you have finished collecting terms you are ready to search. Most databases require that Boolean operators are in upper case, and PubMed is no exception. So it's important when searching PubMed to use AND, OR, NOT to connect your search terms.

You will need to OR the individual words in each column, and then AND the columns together - remembering to use parentheses around the group of terms from each column to preserve the logic of your search. PubMed's tutorial gives a clear explanation of how Boolean logic works.

This is how the table contents are converted to a search strategy:

**First column**

\[
\]

**Second column**

\[
\]

**Third column**

\[
nurs*[tw] OR jsubsetn[text]
\]

When you have long lists of terms it's much easier to search each column separately, then combine them.

**Note:** When searching each column separately you don't need to use parentheses around the groups of terms. When you combine the separate searches, PubMed will treat them as if each search is enclosed in parentheses, and your logic will work.
Performing the search

- Click on the **Advanced** option – top of the PubMed search screen, just under the search box - and clear your search history
- Go back to PubMed’s home page
- Copy and paste the first set of terms into PubMed, and search
- Clear the search box
- Now copy and paste the second set of terms into PubMed, and search
- Clear the search box
- Now copy and paste the third set of terms into PubMed, and search
- Once you have performed the three searches click on the **Advanced** option again. This will display your search history, and allow you to combine the results - using **AND**.
- You can now add language, date, and other limits to your search

Applying Limits

When the final results are displayed you can use the filters on the left hand side of the screen to add language, date, or other limits to your search. Limits in PubMed should be applied with caution.

Language and date limits can safely be applied to all searches, and will not eliminate new material. **However age ranges, species limits, sex limits, and some publication types, e.g. Clinical trial, will restrict results to Medline only, and will eliminate new unindexed articles.**

For example, if I search oncology in titles and abstracts, the search finds thousands of unindexed articles, all of which would be lost if, for example, age range limits were applied.

Try this test:-

- Search oncology [tiab]
- Now try searching oncology [tiab] AND adult [mh]
- Next, repeat the original search, and apply the age limit Adult

So we started with over 76,000 results (#1. After adding adult [mh] the number was dramatically reduced to just over 25,000 (#2), and as you can see from (#3) the result with the limit was identical to the result with the MeSH. So the limit was actually a MeSH – and we lost all of the new unindexed material that our original search found.
Summary

- Create a logic grid with one column for each concept.
- Look for appropriate **MeSH terms** – remember there may be multiple MeSH terms you could use for a concept, or there may not be a MeSH term to describe a concept you are looking for.
- Look for words to search in titles and abstracts – check the **Entry terms** listed in MeSH for suggestions, as well as words appearing in titles and abstracts of articles you find.
- Test how a word or phrase will work in titles or abstracts, by first doing a title search. For example – carcinoma*[ti]
- Add these to your logic grid.
- Click on **Advanced** and clear your search history.
- Perform the search
- Add **limits** - such as language, and publication date.

Saving Searches and Setting up Alerts

You can save your search and rerun it at any time.
You can set up an alert - which will automatically notify you of new material on your topic.
You can export your results to EndNote.

**My NCBI Help**
My NCBI allows you to save searches and set up regular alerts (by email or RSS) of new material on your topic. This site explains everything you need to know, including deleting or changing saved searches.

- **PubMed Tutorial - Saving the Search - Send to Email**
- **PubMed Tutorial - Saving the Search - Send to RSS Feed**

There are also video demonstrations for the following:

- **Save Searches and Set Email Alerts (Video)**
- **Email Alerts for Articles from your Favourite Journals (Video)**

Exporting Results to EndNote

Methods will vary slightly, depending on the browser you are using. See our **EndNote help** for details.
There is a YouTube video on exporting results to EndNote.

**Direct Export from PubMed (Video)**