Searching Help for Nursing Students and Staff

When you embark on a higher degree the dreaded literature review will loom large in your early preparations. It can seem rather daunting, but if you follow a few simple rules you'll save time, and avoid a lot of confusion and frustration. Essentially you are dealing with two simple components - language, and logic. These notes are to help you with both. I've concentrated on PubMed, CINAHL, and Embase, but there are other databases you will need to consider.

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Introduction

One of the problems we all have is that we expect other people to call things by the same name that we do. Even if they don't, in normal conversation this is not a problem, as we rapidly process the alternatives as equivalents. So if I talk about sickness, and you talk about illness it really doesn't matter, as we still understand one another. Databases (with very few exceptions) don't work like this. Instead they search only the exact words we use (including misspellings!). This means that for comprehensive searching you need to provide them with as many possible alternatives as you can. Some of them (like PubMed and CINAHL) even have their own indexing language, or thesaurus, which needs to be considered as well. PubMed has a thesaurus called MeSH - which is simply an acronym for Medical Subject Headings.

We'll begin with PubMed, followed by CINAHL, using the following topic as an example

nursing management of fatigue in cancer patients.

Many postgraduate topics will be more complex, but this is a simple example to demonstrate general principles. As long as you understand these principles you will be able to construct even highly complex searches.

The first step in any search, and the most time consuming, is the construction of an appropriate list of terms for each database you intend to search. PubMed, Embase, and CINAHL all have different indexing languages, so you will need to create a separate search strategy for each one.

First you must analyse the components of your search. In this example there are three:-

Cancer  Fatigue  Nursing

This structure will be reflected in all searches, regardless of the database you choose....now read on.
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.

- 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. Entry terms are NOT MeSH but may appear in titles and abstracts of articles.

- 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

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

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

  **Jsubsetn**
  
  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 or CINAHL 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] 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]

- **[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.

- **[ti]** to search for words in titles of articles - this is useful for testing components of a search  
  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>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Open two web page tabs – 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 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 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:
- Neoplasms
- Tumors
- Tumor
- Benign Neoplasms
- Disease, Neoplastic
- Benign Neoplasms
- Neoplasms, Benign
- Cancer
- Cancers

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.

7. Look up fatigue in MeSH

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

<table>
<thead>
<tr>
<th>Entry Terms:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lassitude</td>
</tr>
</tbody>
</table>

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>
<tbody>
<tr>
<td>Neoplasms[mh]</td>
<td>Fatigue[mh]</td>
<td>Nursing[mh]</td>
</tr>
</tbody>
</table>

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.

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

PubMed contains 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.

Very new material is labelled either

**[PubMed - as supplied by publisher]** example below

```
Quality of life and barriers to symptom management in colon cancer.
Sun V, Borneman T, Koczywas M, Cristea M, Piper BF, Uman G, Ferrell B.
PMD: 21783415 [PubMed - as supplied by publisher]
```

or

**[PubMed - in process]** example below

```
Patients' experiences with cancer-related fatigue: a review and synthesis of qualitative research.
Scott JA, Lasch KE, Barsevick AM, Piault-Louis E.
PMD: 21531669 [PubMed - in process]
```

and will **NOT** have indexing (MeSH) terms added to it.

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 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.

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.

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

**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**


**AND**

**Second column**

(fatigue[mh] OR fatigue*[tw] OR exhaustion*[tw] OR lack of energy*[tw] OR tiredness*[tw] OR weakness*[tw] OR lassitude*[tw])
AND

Third column

(nurs* [tw] OR jsubsetn)

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 under the PubMed search box, and clear your search history
- 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.

<table>
<thead>
<tr>
<th>Search</th>
<th>Add to builder</th>
<th>Query</th>
<th>Items found</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Add</td>
<td>Search nurs* [tw] OR jsubsetn [text]</td>
<td>780082</td>
</tr>
</tbody>
</table>

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 (PubMed, PubMed - in process, PubMed - as supplied by publisher).
**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
- If you are worried about how a word or phrase will work in titles or abstracts, test it by doing a title search. For example – neoplas*[ti]
- Add these to your logic grid
- Click on Advanced, and clear your search history
- Perform the search
- Add limits – such as language, publication date, age ranges

**Dealing with Results**

- 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

Notes (and videos) on all of these are available on my PubMed Help page.
Unfortunately the same search cannot be simply copied and pasted into another database. Although there may be many similarities field names and abbreviations will be different, and the user interface will sometimes require a slightly different method.

In your Word document you'll need to create a new table, or logic grid for your CINAHL search, and simply add words to the appropriate columns as you go.

As you did with PubMed, 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 final comprehensive search using the lists of terms you have created in your Word document.

CINAHL also has a thesaurus of indexing terms called CINAHL Headings. Many, but not all of them, are identical to the headings used in Medline. CINAHL is constructed in such a way that, unlike PubMed it does not automatically explode terms - you have to instruct it to do so.

**CINAHL Useful Tips**

- Open two tabs or browser windows when searching CINAHL - this will allow you to have CINAHL Headings open in one, and CINAHL Advanced Search open in the other. That way it's easy to move between looking up terms and testing searches.
- Click on the Title of an article to see the complete list of CINAHL Headings used to index it. These will be listed as Subjects.
- Check the Used for lists in CINAHL Headings to find words to search in titles and abstracts (to do this click in the box to the left of the Heading).
- CINAHL Headings alone will not produce a comprehensive search, and at times the concept you're dealing with may not even have an appropriate CINAHL Heading.
- CINAHL does not “explode” all CINAHL Headings automatically. To “explode” CINAHL Headings to search more specific subcategories you must add a + at the end
  - e.g. MH neoplasms+
- CINAHL also has an MW option, which allows a word to be searched anywhere in a CINAHL Heading.
- Use truncation (*) ONLY for words in titles or abstracts. **DO NOT TRUNCATE CINAHL HEADINGS!**
- Use inverted commas when searching phrases in titles or abstracts.
- Add limits (such as English language or date limits) only when you have completed your search.
**CINAHL Field Codes**

CINAHL has a wide range of field codes, but the codes you're most likely to use are:-

- **TI** – Article title
- **AU** – Author
- **AB** – Abstract
- **MW** - Word in Subject Heading
- **MH** – Exact Subject Heading
  - To explode a term in CINAHL you must add a + after the term e.g. MH neoplasms+
- **MJ** - Word in Major Subject Heading
- **MM** - Exact Major Subject Heading
- **SO** – Publication Name
- **TX** - Word in all of the database’s searchable fields.

**NOTE:** Using the TX field code will cause the search to look for the keyword in the full text as well as the citation record. However not all records in CINAHL have full text available.

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**Language Part 1 - looking for CINAHL Headings**

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>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Open two browser windows - one for CINAHL Advanced Search, and one for CINAHL Headings


4. Scroll through the results to see if there are any articles that look as if they’re on your topic.

**CINAHL Headings are listed as Subjects. - example below**

*Cancer-related fatigue: a review of nursing interventions.*

(includes abstract); Kirshbaum M; British Journal of Community *Nursing*, 2010 May; 15 (5): 214-6, 218-9 (research, systematic review, tables/charts) ISSN: 1462-4753 PMID: 20453821

Subjects: Cancer; Fatigue; Oncologic Nursing

5. Click on the title of the article to see the complete list of CINAHL Headings used to index it.

6. Look up Cancer fatigue in the CINAHL Headings

7. Click in the box to the left of the term
This will display the subheadings available for the term. As with PubMed, these should be used with great caution.

What is of particular interest is the section at the very bottom of the list of subheadings.

Under **History Notes** you will see that the term has been used as a CINAHL Heading only since 2004. This makes it clear that different terms will need to be used to cover earlier material - we will also need to search the CINAHL Headings Neoplasms and Fatigue.

Under **Used For** is a list of words or phrases which may be useful for searching in titles and abstracts.

8. Look up **oncologic nursing** in the CINAHL headings

9. Click on the box to the left of the term

10. Check the **Related Headings**, and the **Used for** list at the bottom of the subheadings list for additional CINAHL Headings, and words to search titles and abstracts.
11. You now have not 3 concepts to consider, but only two, so a new logic grid for this simple search would be

<table>
<thead>
<tr>
<th>Cancer fatigue</th>
<th>Oncologic nursing</th>
</tr>
</thead>
<tbody>
<tr>
<td>MH cancer fatigue</td>
<td>MH oncologic nursing</td>
</tr>
</tbody>
</table>

If you were doing a search at undergraduate level, this simple search **MH cancer fatigue AND MH oncologic nursing** would probably provide you with a useful overview. But as the indexing term "cancer fatigue" was created only in 2004, you would find only articles published since 2004.

At postgraduate level, a more thorough approach will be needed. **This involves a return to the first 3 column format.**

12. Look up **neoplasms** in the CINAHL Headings

13. This time click on the term itself **NOT the box on the left.**

Under **neoplasms** you’ll see a long list of more specific subcategories. Some of these have boxes with plus signs on their left, and this means that they have a further hierarchy of more specific terms attached to them.

**Note:** - This list is very different from the list of MeSH terms used for the same topic
14. To explode the term Neoplasms, and search all of its subcategories you need to include the following in your logic grid

**MH neoplasms+**

Notice that the field name abbreviation comes before the heading, and the plus sign after it tells it to search all neoplasms.

15. Look up **fatigue** in the CINAHL Headings.

16. Click on the term. You will see that it has two more specific subcategories.

17. By exploding the indexing term Fatigue, you will include both subcategories in your search - so add **MH Fatigue+** to your second column.
**Language Part 2 - looking for words in other fields**

In more advanced searching you will be expected to allow for indexer error, or variation in the interpretation the content of an article, so in CINAHL words in titles and abstracts need to be searched too. Always remember that there is no guarantee that the concept you are searching will have a CINAHL Heading, and you may have to rely solely on words in titles and abstracts to describe the concept.

1. **Use the lists of Used for** terms from CINAHL Headings to give you ideas for words or phrases to search in titles or abstracts, you will probably think of additional possibilities. **NOTE:** CINAHL does not allow you to search titles and abstracts together so you need to do separate searches for terms in each field.

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

3. If phrases are to be searched in titles and abstracts, use inverted commas to enclose the phrase, and ensure that words are not searched independently.

4. Add these terms to the logic grid - the list below is not intended to be comprehensive, but will give you an idea of how you might build a search.

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Fatigue</th>
<th>Nursing</th>
</tr>
</thead>
<tbody>
<tr>
<td>MH neoplasms+ OR TI neoplasm* OR AB neoplasm* OR MH cancer patients OR TI cancer* OR AB cancer* OR TI carcinoma* OR AB carcinoma* OR TI malignant* OR AB malignant* OR TI tumor* OR AB tumor* OR TI tumour* OR AB tumour* OR TI oncolog* OR AB oncolog*</td>
<td>MH fatigue+ OR TI fatigue OR AB fatigue OR TI exhaustion OR AB exhaustion OR TI “lack of energy” OR AB “lack of energy” OR TI tiredness OR AB tiredness OR TI weakness OR AB weakness OR TI lassitude OR AB lassitude</td>
<td>MW nurs* OR TI nurs* OR AB nurs*</td>
</tr>
</tbody>
</table>
**Logic**

You will need to OR the individual words in each column, and then AND the groups of words together - remembering either to search each column separately or to use parentheses around the groups of terms from each column to preserve the logic of your search.

This is how the table contents for our 3 column grid are converted to a search strategy:

**First column**

(MH neoplasms+ OR TI neoplasm* OR AB neoplasm* OR MH cancer patients OR TI cancer* OR AB cancer* OR TI carcinoma* OR AB carcinoma* OR TI malignan* OR AB malignan* OR TI tumor* OR AB tumor* OR TI tumour* OR AB tumour* OR TI oncolog*)

**AND**

**Second column**

(MH fatigue+ OR TI fatigue OR AB fatigue OR TI exhaustion OR AB exhaustion OR TI “lack of energy” OR AB “lack of energy” OR TI tiredness OR AB tiredness OR TI weakness OR AB weakness OR TI lassitude OR AB lassitude)

**AND**

**Third column**

(MW nurs* OR TI nurs* OR AB nurs*)

**Note:** Here we’ve used the CINAHL option MW - which will search for the word nurs* in any CINAHL Heading

**Performing the search**

- Copy and paste the first set of terms into the first Advanced Search box
- Copy and paste the second set of terms into the second Advanced Search box
- Copy and paste the third set of terms into the third Advanced Search box
- Click on Search - the sets of terms in each of the three boxes will be combined using AND
Summary

- Create a logic grid with one column for each concept.
- Look for appropriate CINAHL Headings.
- Look for words to search in titles and abstracts – check the Used for terms listed with CINAHL Headings for suggestions, as well as words appearing in titles and abstracts of articles you find.
- Add these to your logic grid.
- Perform the search
- Add limits.

Dealing with Results

- 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

Notes (and videos) on all of these are available on my CINAHL Help page.
**Embase**

In your Word document you'll need to create a new table, or logic grid for your Embase search, and simply add words to the appropriate columns as you go.

As you did with PubMed, 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. Embase includes all Medline data from 1996, but it doesn't include the new unindexed material that you will find in PubMed, nor does it allow the level of sophistication in searching Medline that you will find in Pubmed. In other words it's **NOT** an alternative to PubMed.

Embase, like PubMed and CINAHL, has an indexing language. This is called Emtree, and is the equivalent of PubMed’s MeSH. However its field names and the way in which they are applied are very different from PubMed and CINAHL, and unlike PubMed it does not automatically explode terms - you have to instruct it to do so.

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**Embase Useful Tips**

- Use two browser windows or tabs in Embase – one for Advanced Search, and one for Emtree. That way it's easy to move between looking up terms and testing searches.

- Click on **Index Terms** to see the Emtree terms used for a particular article.

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

- Be aware that Embase does **NOT** explode Emtree terms automatically to search more specific subcategories. You have to tell it to do so.

- Always check Emtree headings to see the lists of more specific terms before you explode them.

- In Embase you need to enclose all phrases in inverted commas, otherwise the words will be searched separately, and they may be found nowhere near one another. It doesn't matter whether you use single or double quotation marks as long as you are consistent.

- Check Embase wildcard and truncation options - they have now been expanded.

- Multiple fields can be searched at the same time. e.g. neoplas*:ti,ab,

- Use the **Advanced Search screen**, and always turn off the “Map to preferred term in Emtree” option. This will turn off all mapping options, leaving you in control of your search.

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

When searching Embase 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!

If you search a word or phrase without a field name attached, Embase will map your term to what it thinks is an appropriate Emtree term, it will explode that term, and it will also search your word as free text in all fields. This may produce some rather unexpected results, and is generally **NOT RECOMMENDED** for advanced searching where greater precision and control are needed.

Embase has a wide range of field codes, but those you're most likely to use are:

**/de** – to search for an exact Emtree heading

*E.g.* neoplasm/de This search will retrieve articles indexed **ONLY** with the general term neoplasm. It will **NOT** search the narrower, more specific terms in the subject tree

**:de** - to search for words or phrases anywhere in an Emtree heading

*E.g.* neoplasm:de This search will retrieve articles where the word neoplasm occurs somewhere in the Emtree heading. It will **NOT** explode the term, but it will often find additional material where the word neoplasm is not the only word in the heading, *e.g.* myeloproliferative neoplasm

**/exp** - to explode terms to include narrower more specific terms listed in the subject tree, as well as the general term

*E.g.* neoplasm/exp

**/majr** – to restrict your search to major indexing terms only

*E.g.* neoplasm/majr

**/syn** – to explode an Emtree term and to search that term in all searchable fields. All of the **Synonyms** listed in Emtree for that term will also be searched in all fields. The narrower terms in the subject tree will be searched only as indexing terms **NOT** in other fields.

*E.g.* neoplasm/syn

**:lnk** to “free float subheadings in Embase, so that they are not attached to a specific index term

*E.g.* "adverse drug reaction":lnk

Subheadings are listed under **drug subheadings, routes of drug administration**, and **disease subheadings**

**:ti** – to search for words or phrases in titles of articles

*E.g.* neoplasm*:ti

**:ab** – to search for words or phrases in abstracts of articles

*E.g.* neoplasm*:ab

**:jt** – to search for an exact journal title

*E.g.* "New England Journal of Medicine":jt

**:ta** – to search for an abbreviated journal title

*E.g.* "new engl j med":ta

To search a word or a phrase in **ALL FIELDS** simply type it into the Advanced Search box, and **uncheck the “Map to preferred term in Emtree” option**
**Language Part 1 – looking for Emtree terms**

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.

2. Open two browser windows - one for Embase Advanced Search (use the drop down box under Search at the top left of your screen) and one for Emtree. (use the drop down box under Browse at the top left of your screen. Right click on the link to open Emtree in a new tab.)

3. At the Advanced Search screen turn off the “Map to preferred term in Emtree” option. This will turn off all mapping options leaving you in control of your search.


5. Scroll through the results to see if there are any articles that look as if they're on your topic.

6. Once you have found a suitable article click on **Indexing Terms**. This will display a list of Emtree terms

   The article I have chosen is “Distress in cancer patients”

   And the indexing is

   ![Indexing Terms](image)

   When you look at the indexing (Emtree) terms you can see that, like CINAHL, Embase has a term, not only for cancer, but also for cancer patients. However its term for cancer is neoplasm (singular), whereas both CINAHL and
PubMed use the plural – neoplasms, and Embase uses cancer patient (singular) whereas CINAHL uses the plural form – cancer patients.

If you look at the article I used as an example in PubMed “Fatigue in patients with advanced cancer”,

You’ll see that the indexing is less detailed, and the most appropriate headings have not been used. This is why you need to allow for a range of possibilities in your search construction – indexers do not always get it right!

7. Look up fatigue in Emtree

Rather than exploding the term it may be better to search the general term, and a selection of the narrower terms

fatigue/de OR "cancer fatigue"/de OR exhaustion/de OR lassitude/de

8. Look at the synonyms listed further down the screen – there is only one supplied – tiredness – and this could be searched in titles and abstracts.

tiredness:ti,ab
9. Look up neoplasm in Emtree

In this case Embase allows two possibilities to consider for your search.

a) If you search `neoplasm/exp` the term will be exploded to include all of the narrower terms.

b) If you search `neoplasm/syn` then the following will happen:

- The term neoplasm will be exploded
- The term neoplasm will be searched in all fields
- All of the synonyms listed will be searched in all fields
- The narrower terms in the exploded subject tree will be searched only as indexing terms

Option b. is unique to Embase
10. Look up nursing in Emtree

Again you have two options – either nursing/exp, or nursing/syn
11. Look up nurse in Emtree – this produces a different list which may also be relevant.

Again you can choose - either nurse/exp or nurse/syn

12. Now update your logic grid with the appropriate Emtree terms

**Note:** When searching Embase ALL phrases must be enclosed in inverted commas. It doesn’t matter whether you use double or single quotes, as long as you’re consistent.

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Fatigue</th>
<th>Nursing</th>
</tr>
</thead>
<tbody>
<tr>
<td>neoplasm/exp</td>
<td>fatigue/de</td>
<td>nursing/exp</td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td>OR</td>
</tr>
<tr>
<td>&quot;cancer patient&quot;/exp</td>
<td>&quot;cancer fatigue&quot;/de</td>
<td>nurse/exp</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>exhaustion/de</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lassitude/de</td>
<td></td>
</tr>
</tbody>
</table>

*Language Part 2 – looking for words in other fields*

1. Use lists of terms you have already used in CINAHL and PubMed to provide 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 Embase search for additional synonyms and other alternative words to add to your search.

3. If you have used /syn with the Emtree terms in your search then you will already have included the synonymous words and phrases suggested by Emtree (these synonyms are the equivalent of the Entry terms in MeSH). If you have used /exp /de or :de with the Emtree terms in your search, then you will need to check the appropriate synonyms lists for additional words and phrases to search in titles and abstracts.
4. Add these terms to the logic grid, remembering that **ALL** phrases must be enclosed in inverted commas (quotes)

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Fatigue</th>
<th>Nursing</th>
</tr>
</thead>
<tbody>
<tr>
<td>neoplasm/exp</td>
<td>fatigue/de</td>
<td>nursing/exp</td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td>OR</td>
</tr>
<tr>
<td>neoplasm*:ti,ab</td>
<td>&quot;cancer fatigue&quot;/de</td>
<td>nurse/exp</td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td>OR</td>
</tr>
<tr>
<td>&quot;cancer patient&quot;/de</td>
<td>fatigue:ti,ab</td>
<td>nurs*:ti,ab</td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>cancer*:ti,ab</td>
<td>exhaustion/de</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>carcinoma*:ti,ab</td>
<td>exhaustion:ti,ab</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>malignant*:ti,ab</td>
<td>&quot;lack of energy&quot;:ti,ab</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>tumour*:ti,ab</td>
<td>tiredness:ti,ab</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>tumor*:ti,ab</td>
<td>weakness:ti,ab</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>oncolog*:ti,ab</td>
<td>lassitude/de</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lassitude:ti,ab</td>
<td></td>
</tr>
</tbody>
</table>

**Logic**

When you have finished collecting terms you are ready to search. You will need to OR the individual words in each column, and then AND the columns together

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

**First column**

neoplasm/exp OR neoplasm*:ti,ab OR "cancer patient"/de OR cancer*:ti,ab OR carcinoma*:ti,ab OR malignant*:ti,ab OR tumour*:ti,ab OR tumor*:ti,ab OR oncolog*:ti,ab

AND

**Second column**

fatigue/de OR "cancer fatigue"/de OR fatigue:ti,ab OR exhaustion/de OR exhaustion:ti,ab OR "lack of energy":ti,ab OR tiredness:ti,ab OR weakness:ti,ab OR lassitude/de OR lassitude:ti,ab

AND

**Third column**
	nursing/exp OR nurse/exp OR nurs*:ti,ab

**Note:** For more exhaustive searching you may like to consider nurs* without a field name attached, instead of nurs*:ti,ab. As long as you have turned off the “Map to preferred term in Emtree” option, nurs* will be searched in all fields.
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, Embase will treat them as if each search is enclosed in parentheses, and your logic will work

**Performing the Search**

- Go to the Results page, click on Search History, and delete all previous searches
- Go back to the Advanced Search page
- Make sure the “Map to preferred term in Emtree” option is turned off
- Copy and paste the first set of terms into Embase, and search
- Now that you’ve turned off mapping, you can simply use the search box at the top of the results screen for the rest of your searches. So copy and paste the second set of terms into Embase, and search
- Now copy and paste the third set of terms into Embase, and search
- Once you have performed the three searches click in each search box to select the three searches, make sure the AND option is selected, and click on Combine

**Applying Limits**

Select the limits you want from the options in the toolbar at the top of the screen.

Then press Enter to rerun your final search with the limits applied.
Summary

- Create a logic grid with one column for each concept.
- Look for appropriate Emtree terms
- Look for words to search in titles and abstracts – check the Synonyms listed with Emtree terms for suggestions, as well as words appearing in titles and abstracts of articles you find.
- Add these to your logic grid.
- Perform the search
- Add limits.

Dealing with Results

- 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

Instructions for all of these are available on my Embase Help page.
Other Databases

There will be other databases, apart from PubMed and CINAHL, that will be useful for your topic, and you’ll find a list on my databases page.

The biggest of these is Scopus, and although it doesn’t have the sophisticated subject search capability of PubMed or CINAHL it has some extremely useful features which will allow you to extend your search with very little effort. Its greatest strength is its citation searching capacity. You can easily “translate” a PubMed search for Scopus, and while it may produce many of the same articles, there will be lots of additional material, and you will have some extra options available.

To see these additional features:

- Copy and paste the title of the article below (enclosed in inverted commas) into the Scopus Search box.

  “Relationships among pain, fatigue, insomnia, and gender in persons with lung cancer”

- Set the in box to Article Title, and search

  "Relationships among pain, fatigue, insomnia, and gender in persons with lung cancer" in Article Title

  E.g., "heart attack" AND stress

Once the result is displayed

You can

- Access the full text of the article
- View a list or articles which have subsequently cited this reference by clicking on the number at the right of the display
- View the abstract and references of the article by clicking on the article title. Each reference in the list also has links to full text, as well as its own abstract and references, and number of times cited.

Dodd, M.J., Miaskowski, C., Paul, S.M.

Symptom clusters and their effect on the functional status of patients with cancer.

This means that from a single article you can explore a wide range of related material. Although CINAHL also allows citation searching, the range of journals it covers is only a fraction of the range included in Scopus.
Systematic Reviews

Systematic reviews (in the strictest sense) require extremely comprehensive searching, and include grey literature, but in practice the term "systematic review" is used to refer to a range of approaches, from exhaustive searching of the literature, involving many databases, and including searching grey literature, to searches involving a predetermined set of databases, with no consideration of grey literature.

Before embarking on a systematic review, always check with your supervisor to clarify what is expected in terms of the range of databases, and other sources to be searched.

Below are some links which should help to clarify what is involved. Additional information can be found on my evidence based medicine page.

What is a systematic review?
By Pippa Hemingway and Nic Brereton. 2nd. ed. Hayward Medical Communications, 2009.

Finding studies for systematic reviews: a resource list for researchers
Provides a list of databases recommended by the Centre for Reviews and Dissemination at the University of York. However not all of these databases may be relevant for a particular topic.

The Joanna Briggs Institute Systematic Reviews
General information on systematic reviews as well as useful information on levels of evidence.

PROSPERO
PROSPERO is the first open access online facility to prospectively register systematic reviews.

Systematic Reviews: CRD’s guidance for undertaking reviews in healthcare
Guidelines developed and published by the NHS Centre for Reviews and Dissemination, which can be used as a framework for carrying out systematic reviews or used for information by organisations commissioning reviews.

Search Filters

Below are links to a range of search filters developed by expert groups. You may find them useful in developing your own search strategies.

Cochrane Search filters

ISSG Search Filters
The InterTASC Information Specialists' Sub-Group (ISSG) is the group of information professionals supporting research groups within England and Scotland providing technology assessments to the National Institute for Health and Care Excellence (NICE) and other associated Information Specialists.

Search filters used by SIGN
SIGN is the Scottish Intercollegiate Guidelines Network, which develops evidence based clinical practice guidelines for the National Health Service (NHS) in Scotland.
**Checklist for Completed Searches**

When you have done all of your searches it's best to check to make sure that they are as complete as possible, and that the searches for all databases are very similar - in fact all of the words and phrases that you have searched in fields outside the databases' indexing languages (MeSH, Emtree etc.) should be the same in each search.

- **Have you searched indexing terms (MeSH, Emtree etc.) in other fields?**
  
  Searching neoplasms as a MeSH will explode the term, but won’t look for the word in other fields – all indexing terms need to be searched in other fields, such as titles and abstracts.
  
  e.g. neoplasms[mh] OR neoplasm*[tw] The only exception to this would be where terms are inverted – e.g. nurses, community health[mh], in which case you would search community health nurs*[tiab]

- **Have you looked extensively for synonyms and related words and phrases which may appear in titles and abstracts – have you included PubMed’s Entry terms and Embase’s Synonyms in your list.**
  
  **Have you then tested each of them before including them in your search? I usually do a title search for words or phrases I want to use, just to make sure they work.**

- **Have you allowed for British and American spelling in words and phrases to be searched outside the indexing languages (MeSH, Emtree etc.)?**
  
  e.g. tumor*[tiab] OR tumour*[tiab]

- **Have you allowed for both singular and plural forms of words and phrases to be searched outside the indexing languages (MeSH, Emtree etc.)?**
  
  e.g. woman[tiab]OR women[tiab]

- **Are your lists of words and phrases to be searched outside the indexing languages (MeSH, Emtree etc.) identical across all databases searched – in other words are your searches as similar as possible?**

- **Have you applied limits to your searches? In PubMed language and date limits can be used safely, but 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**

- **If you have excluded certain indexing terms, or terms in titles and abstracts, could this have compromised your search?**
  
  e.g. excluding child[mh] will exclude articles which deal with BOTH adults and children.