

# Creating a comprehensive search strategy

A tool for guiding and documenting the process

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## Make the question searchable

Creating a searchable research question can be tough. Here are strategies to help:

### Use the PCC method

For a scoping review, use PCC<sup>1</sup>

Component	Example	Fill in
Population	age, diagnoses, sex, ethnicity	
Concept	intervention, phenomena, outcome	
Context	care setting, time frame, location	

*i* Other formulas for different types of reviews can be found [here](#)<sup>3</sup>.

### Describe the ideal article

To make your research question specific and searchable, ask yourself:

What type of information would the ideal primary article include?<sup>2</sup> Describe what this article would look like below:

## Conduct a preliminary search

A **preliminary search**<sup>4,5</sup> is a *brief* search of your topic to:

- ensure your topic is **not** already covered by a completed or upcoming review
- confirm there is enough literature for a viable review
- identify subject headings and text words relevant to your search strategy (described further below)

*i* Use Google, Google Scholar, PubMed and/or Scopus in this preliminary search

## Select appropriate database(s)

For health related topics, start with Medline (Ovid) first since it has broad coverage of health science literature. Others to consider are:


Embase	broad coverage of health science research (more European literature)
CINAHL	coverage of rehabilitation, nursing, allied health literature
Cochrane Library	unique content of synthesized evidence within health care
PsycINFO	coverage of psychosocial and qualitative research

*i* For more databases click [here](#)<sup>6</sup>.

Components of your research question differ in whether they are used in your search terms or used during the screening phase<sup>7</sup>.

## Identify minimum components

Your search strategy should be based on the minimum search components of the research question. They are usually the **population** and the **concept**.

-  Identifying relevant subject headings and text words for your minimum search components ensures a robust search. Learn about [text words](#) and [subject headings here](#)<sup>8</sup>.

Fill out the table below:

<b>Search terms</b>	<b>Population</b> (component 1)	<b>Concept</b> (component 2)	<b>Context or concept</b> (component 3)
<a href="#">Subject headings</a>			

[Text words](#)

-  Identify subject headings within a database. Watch this [tutorial](#)<sup>9</sup> for more information.

Use Google, a thesaurus and Scopus to identify words used to describe each component. Watch this [tutorial](#)<sup>10</sup> for more information.

-  Including outcomes in the search terms is risky because they often don't appear in the title/abstract which are what articles are typically indexed by<sup>7</sup>. It also increases the likelihood for bias if the search is based on outcomes you want or expect to see.

## Identify inclusion/exclusion criteria

Clearly defined inclusion and exclusion criteria are important. However, including these in your search terms is risky. Including them makes it more likely that you'll miss relevant articles.

Inclusion/exclusion criteria become important at the article screening phase, after you have executed your search<sup>5</sup>. Write your inclusion and exclusion criteria here:

[Inclusion criteria](#)

[Exclusion criteria](#)

-  Read more on defining exclusion and inclusion criteria [here](#)<sup>11</sup>

# Formulate the search strategy

Here is how to make your search strategy more efficient and less confusing:

## Structure your search

The success of your search depends on the appropriate combination of your search terms<sup>7</sup>:

- 1** Search **component 1** (population)
    1. Enter all relevant subject headings
    2. Enter all relevant text words
    3. Combine all of the above using the **OR** operator
  - 2** Search **component 2** (concept)
    1. Enter all relevant subject headings
    2. Enter all relevant text words
    3. Combine all of the above using the **OR** operator
  - 3** Combine search **component 1** with search **component 2** using the **AND** Boolean operator.
  - 4** Continue this process for each search component (i.e. other concepts or context).
- i** View a detailed example of identifying search components [here](#)<sup>12</sup>

## Use operators and field codes

Articles may not be indexed by the subject heading you thought it would be. This makes your text word searching critical. Field codes and operators are helpful tools for optimizing text word searching. Here are commonly used codes and operators used in Ovid Medline:

### Field code

- .ti,ab.** Use this code after each of your text words to search titles and abstracts.  
Note: **.tw.** = **.ti,ab.**
- \*** Use the star at the end of a root word to find all permutations of a text word;  
e.g. **therap\*** finds therapy, therapies, therapeutic
- .kw** Use this code to find author provided key words

### Operator

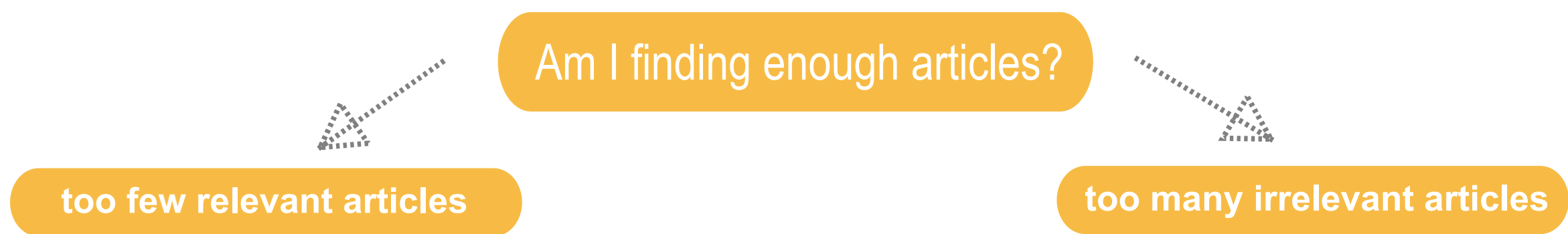
- adj(n)** Use this operator between two text words used to describe a component. It will search for these text words (in any order) with n-1 (or less) words between them;  
e.g. **arts adj3 therapy** will find **arts therapy**, **arts** based occupational **therapy** as well as **arts** and play **therapy**.

Here is a sample search strategy using field codes and operators in Ovid Medline

# ▲	Searches	Results
1	exp myelitis/ or exp spinal cord injuries/ or exp central cord syndrome/ or exp paraplegia/ or exp brown-sequard syndrome/ or exp quadriplegia/	84469
2	((spine or spinal) adj4 (injur* or trauma*)).ti,ab,kw.	49167
3	(parapleg* or quadrapleg*).ti,ab,kw.	16183
4	1 or 2 or 3	110158
5	exp electric stimulation therapy/ or exp electroacupuncture/ or exp spinal cord stimulation/ or exp transcutaneous electric nerve stimulation/	74253
6	((function* or electric*) adj4 stimulat*).ti,ab,kw.	75576
7	5 or 6	139476
8	exp adolescent/ or exp child/ or exp child, preschool/	2859489
9	(child* or youth* or adolescen* or teen* or young* or pe?diatric* or toddler*).ti,ab,kw.	2047053
10	8 or 9	3704433
11	4 and 7 and 10	420



Pilot your search strategy to optimize it, it's unlikely to 'get it right' the first time<sup>7</sup>. Ask yourself:



Your search terms **may** be too vague or too narrow:

Welcome to the game of trial and error. Think critically about your results to determine if search terms need to be re-defined, rearranged or removed.

Document your terms here:

Your search terms **may** be too vague, or you might be using suboptimal terms:

Browse the first 50 results. Look at the most relevant articles and check if there are any subject headings or text words that should be incorporated into your search.

Document your terms here:

## Component 1

## Component 2

## Component 3

### Search terms

Subject headings

OR


AND

OR

AND

OR

Text words

 A mixture of relevant and irrelevant records is a good thing. It means there is a balance between precision (capturing some relevant and fewer irrelevant results) and sensitivity (capturing most relevant and a lot of irrelevant records).

Document your completed search strategy here:

 Watch this [tutorial](#)<sup>13</sup> for more information on saving and documenting your search strategy.

**Note:** This section was adapted from Lenton, Fuller, & Bradley-Ridout (2017).

# Translate the search strategy

Up until this point you've been working in one database . Unluckily, different databases can have different subject headings and field codes, meaning you have to modify or translate your search.

## Modifying strategies

Here is a list of commonly used health science databases with tutorials on how to search within them:

OVID Embase [tutorial](#)

Ebsco CINAHL [tutorial](#)

Cochrane Central [tutorial](#)

Scopus [tutorial](#)

## Common field codes

Field code <sup>2</sup>	Embase Ovid	Medline Ovid	CINAHL Ebsco	Cochrane Cochrane Library	Scopus ELSEVIER
<b>Title/abstract</b> Find terms within the title and abstract	.ti,ab	.ti,ab	TI or AB (can't combine codes)	:ti,ab	TITLE-ABS-KEY
<b>Proximity code</b> Find terms which are within a specific number of words of each other, in either direction.	adj#	adj#	N#	near/#	W/#
<b>Wildcards</b> Find terms that have different spellings e.g. paediatric/pediatric	?	?	#	*	? or *

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### References

- 1 The Joanna Briggs Institute. (2015). The Joanna Briggs Institute Reviewers' Manual 2015: Methodology for JBI Scoping Reviews. Retrieved from: [http://joannabriggs.org/assets/docs/sumari/Reviewers-Manual\\_Methodology-for-JBI-Scoping-Reviews\\_2015\\_v2.pdf](http://joannabriggs.org/assets/docs/sumari/Reviewers-Manual_Methodology-for-JBI-Scoping-Reviews_2015_v2.pdf)
- 2 Bramer, W., de Jonge, G., Rethlefsen, M., Mast, F., Kleijnen, J. (2018). A systematic approach to searching: An efficient and complete method to develop literature searchers. *Journal of the Medical Library Association*, 106(4), <https://dx.doi.org/10.5195%2Fjmla.2018.283>
- 3 Gerstein Science Information Centre. (2019). Turn your Research Question into a Searchable Question. Retrieved from: <https://guides.library.utoronto.ca/c.php?g=577919&p=3987287>
- 4 Robert Gordon University. (2018). Systematic reviews: Question and protocol. Retrieved from: <https://libguides.rgu.ac.uk/c.php?g=536793&p=3673880>
- 5 Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., Britten, N., Roen, K., & Duffy, S. (2006). Guidance on the conduct of narrative synthesis in systematic reviews. Lancaster University. Retrieved from: <https://www.lancaster.ac.uk/shm/research/nssr/research/dissemination/publications.php>
- 6 Gerstein Science Information Centre. (n.b.). Subjects A-Z. Retrieved from: <https://oneseach.library.utoronto.ca/subjects-a-z/all>
- 7 Lenton, E., Fuller, K., Bradley-Ridout, G. (2017). Strategies for systematic, scoping and other comprehensive searches of the literature: Part 1 - Structured approach to searching the medical literature for knowledge synthesis. Workshop, Gerstein Science Information Centre at the University of Toronto, delivered November 20, 2017
- 8 Gerstein Science Information Centre. (2019). Text words vs subject headings. Retrieved from: <https://guides.library.utoronto.ca/c.php?g=577919&p=4305874>
- 9 gersteinlibrary. (2017). Medline 2 - Searching with subject headings [Video file]. Retrieved from: <https://www.youtube.com/watch?v=XHhbYbzuixs>
- 10 gersteinlibrary. (2017). Medline 4 - Improved textword searching [Video file]. Retrieved from: <https://www.youtube.com/watch?v=7G-wdi0wn2l>
- 11 The University of Melbourne. (2019). Inclusion and exclusion criteria. Retrieved from: <http://unimelb.libguides.com/c.php?g=492361&p=3368110>
- 12 Gerstein Science Information Centre. (2019). Using AND/OR (aka Boolean Operators) to construct search strategy. Retrieved from: <https://guides.library.utoronto.ca/c.php?g=577919&p=3987297>
- 13 Gerstein Science Information Centre. (2019). Why document your search?. Retrieved from: <https://guides.library.utoronto.ca/c.php?g=577919&p=4123560>