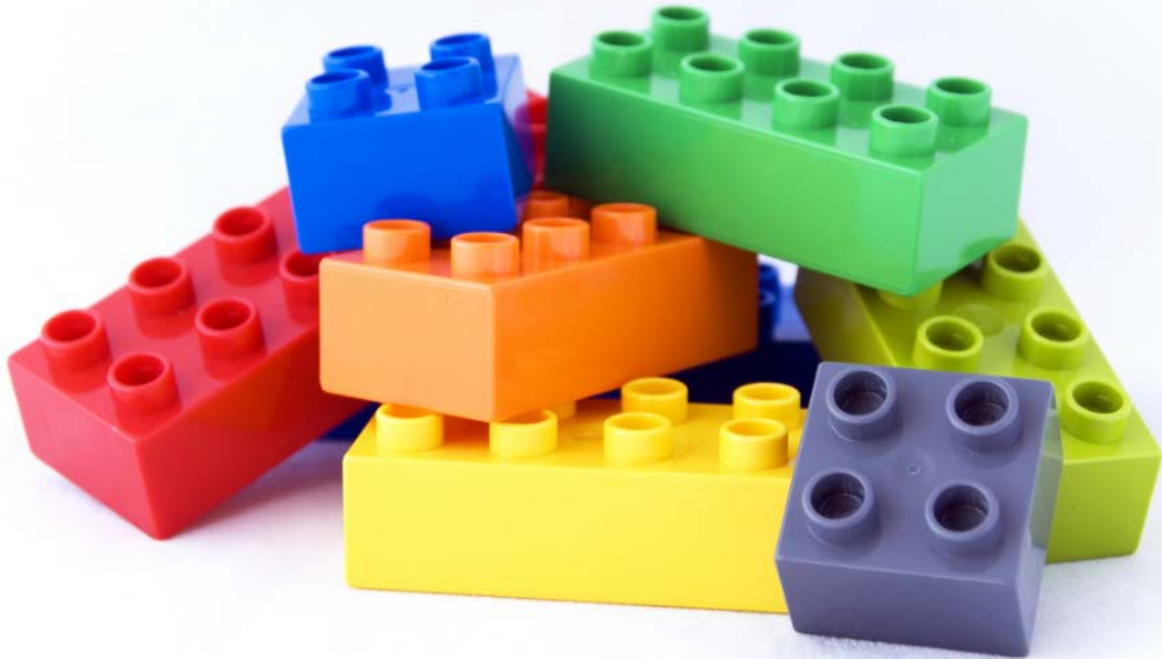


# Doctoral Skills Programme



## Literature review:

### Systematic reviews – the search strategies

### Learning outcomes

At the end of the workshop participants will be able to:

- Select, access and search some key databases using a variety of advanced techniques to obtain systematic review-related literature
- Save a search and edit a saved search in Ovid databases
- Create an email alert to track new publications.

Doctoral Skills Programme  
The University of Auckland  
Email: [doctoralskills@auckland.ac.nz](mailto:doctoralskills@auckland.ac.nz)  
[www.auckland.ac.nz/doctoral-hub](http://www.auckland.ac.nz/doctoral-hub)



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## Meet your Subject Librarian

We are librarians with responsibilities for specific subjects available to help you with your research. We strongly suggest you make a time to meet us early in your doctorate for an individual research consultation. Find your librarian and his or her contact details here: <http://www.library.auckland.ac.nz/services/research-support/subject-librarians>



Research consultations, assistance with in-depth information queries, identification of key resources, advice on search strategies for finding information and creating research alerts, and advice with referencing.

# What is a systematic review?

'A systematic review attempts to identify, appraise and synthesize all the empirical evidence that meets pre-specified eligibility criteria to answer a given research question. Researchers conducting systematic reviews use explicit methods aimed at minimizing bias, in order to produce more reliable findings that can be used to inform decision making.'

<http://www.cochranelibrary.com/about/about-cochrane-systematic-reviews.html>

## Difference between a systematic review and a non-systematic review

- The **only** difference is that a systematic review has an explicit rigorous methodology. This makes the results of the review accountable and open to criticism and debate<sup>1</sup>.
- differ from traditional literature reviews which commonly focus on the range and diversity of primary research using a selective, opportunistic and discursive approach with no clear audit trail leading from the primary research to the conclusions of the review<sup>2</sup>.

1. <http://www.alliance4usefulevidence.org/assets/Alliance-FUE-reviews-booklet-3.pdf>

2. Oakley A, Gough D, Oliver S, Thomas J. The politics of evidence and methodology: lessons from the EPPI-Centre. Evidence & Policy: A Journal of Research, Debate and Practice. 2005;1(1):5-32.

## Searching as part of the systematic review process

Searches as part of a systematic review need to be:

- **Comprehensive**
  - Aim to include all synonyms, variations, word endings and related terms for each concept. When a database provides searching with both subject headings and keywords, it is important to search for **both** subject headings **and** keywords to ensure a comprehensive search.
- **Structured and methodical**
  - The same keywords are used consistently across the databases
- **Replicable/transparent**
  - Search strategies are recorded and publicly available for others to see how you found your papers should they want to replicate the search.
  - Use the PRISMA framework to record databases searched, number of results etc <http://www.prisma-statement.org/>
- **Updateable**
  - A systematic review is a living document and ideally should be updated on a regular basis.

This workshop focuses on constructing an in-depth search strategy, as required and expected of a systematic review. It covers the advanced search techniques needed for comprehensive searching using core databases for health-related systematic reviews, in particular **Medline**, **Embase** and **PsycINFO** on the Ovid platform.

# Getting started

The systematic review process consists of taking a structured question, breaking it down into an itemised search procedure and applying a methodological filter.<sup>1</sup>

1 Booth A, Carroll C. Systematic searching for theory to inform systematic reviews: is it feasible? Is it desirable? Health Information & Libraries Journal. 2015: doi:10.1111/hir.12108

## What is your thesis topic?

The PICO framework may be useful to 'unpack' your topic –

- P (Patient or Population or Problem)
- I (Intervention or Exposure)
- C (Comparison)
- O (Outcome)

Further explanation of the PICO framework plus additional frameworks is at:

[https://flexiblelearning.auckland.ac.nz/philson/11\\_16.html](https://flexiblelearning.auckland.ac.nz/philson/11_16.html)

P	
I	
C	
O	

- Turn the PICO components into a research question; or if the PICO framework doesn't suit your topic write the title of your thesis or a sentence reflecting your topic.

- Underline the key concepts in your sentence above.

Now, transfer these key concepts into the relevant top boxes in the table on p.5, then for each key concept think of and write down:

- synonyms
- any antonyms (if appropriate)
- other words/terms with a similar or related meaning

### Example:

The key concept you write in the first box is children

In the boxes underneath, you may think of the following: child; childhood; children; paediatric; paediatrics; pediatric; pediatrics; infant; infants.

Things to think about re your concept words

- Singular and plural
- Variant word endings
- British v American spelling
- One word or two eg pre-operative v preoperative; healthcare v health care
- Acronyms
- Abbreviations

## Truncation symbols and wildcards

A truncation symbol may be used to retrieve singular, plural and variant endings of a word. The most common truncation symbol is a \*

Example: diabet\* to search for diabetes, diabetic, diabetics

The wildcard symbol (?) may be used for zero or one character in British v American spelling

Example: tumo?r, p?ediatrics

When in doubt dispense with truncation and wildcards and spell the words out. Not all databases use truncation – see Help or Search tips links in individual databases.

## Combining with AND & OR

Combine the key concepts and synonyms in your table using AND and OR.

(Tip: **AND** = BOTH/ALL; **OR** = ANY/EITHER)

There is a third operator, **NOT/AND NOT**, useful in some circumstances.

Use the following resource to check your understanding of Boolean operators:

<https://www.escholar.manchester.ac.uk/learning-objects/sr/boolean/>

Combine with



Concept 1		Concept 2		Concept 3		Concept 4
Synonyms		Synonyms		Synonyms		Synonyms



# Searching databases

A database is a searchable electronic catalogue or index, often containing information about published items. The University Library subscribes to databases essential to search as part of the systematic review process plus others that may be useful to your research depending on the topic of your systematic review.

They allow you to save searches to rerun later, perform complex searches and limit your results with a variety of options such as date and publication or study type. These options are not always available with Google or Google Scholar and it may be more difficult to record your searches so that they can be reproduced.

## Selecting appropriate databases

Look at a systematic review that has already been done similar to your topic or subject area to see what databases the authors used.

Morgan T, Williams L, Trussardi G, Gott M. Gender and family caregiving at the end-of-life in the context of old age: A systematic review. *Palliat Med.* 2016;30(7):616-24. <http://dx.doi.org/10.1177/0269216315625857>

We searched five electronic databases (MEDLINE, CINAHL, PsycINFO, Sociological Abstracts and Gender Studies)

Jull AB, Cullum N, Dumville JC, Westby MJ, Deshpande S, Walker N. Honey as a topical treatment for wounds. *Cochrane Database Syst Rev.* 2015(3):CD005083.

For this update of the review we searched the Cochrane Wounds Group Specialised Register (searched 15 October 2014); The Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2014, Issue 9); Ovid MEDLINE (1946 to October Week 1 2014); Ovid MEDLINE (In-Process & Other Non-Indexed Citations 13 October 2014); Ovid EMBASE (1974 to 13 October 2014); and EBSCO CINAHL (1982 to 15 October 2014).

Weston PJ, Harris DL, Battin M, Brown J, Hegarty JE, Harding JE. Oral dextrose gel for the treatment of hypoglycaemia in newborn infants. *Cochrane Database Syst Rev.* 2016(5):CD011027.

We searched MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials (CENTRAL), the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Web of Science from inception of the database to February 2016. We also searched international clinical trials networks and handsearched proceedings of specific scientific meetings.

Hartmann-Boyce J, McRobbie H, Bullen C, Begh R, Stead LF, Hajek P. Electronic cigarettes for smoking cessation. *Cochrane Database Syst Rev.* 2016;9:CD010216.

We searched the Cochrane Tobacco Addiction Group's Specialized Register, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, Embase, and PsycINFO for relevant records from 2004 to January 2016, together with reference checking and contact with study authors.

Another systematic review on the same topic:

Malas M, van der Tempel J, Schwartz R, Minichiello A, Lightfoot C, Noormohamed A, et al.

Electronic cigarettes for smoking cessation: A systematic review. *Nicotine Tob Res.* 2016;18(10):1926-36.

PubMed, MEDLINE, PsycINFO, CINAHL, ERIC, ROVER, Scopus, ISI Web of Science, Cochrane Library, and the Ontario Tobacco Research Unit (OTRU) library catalogue. Gray literature was searched using Grey Matters, OAlster, Open Grey, the NYAM Web site, the Legacy Library, BIOSIS Previews, Conference Papers Index, ISI Proceedings, Dissertation Abstracts International, CIHI, and Grey Net International

Siu J, Hill AG, MacCormick AD. Systematic review of reusable versus disposable laparoscopic instruments: costs and safety. *ANZ J Surg.* 2017;87(1-2):28-33.

Medline and EMBASE

Look at databases by subject to see which of these the University of Auckland Libraries and Learning Services subscribes to:

<https://www.library.auckland.ac.nz> > Search Databases > Faculty or Subject.

For further advice, please contact your Subject Librarian:

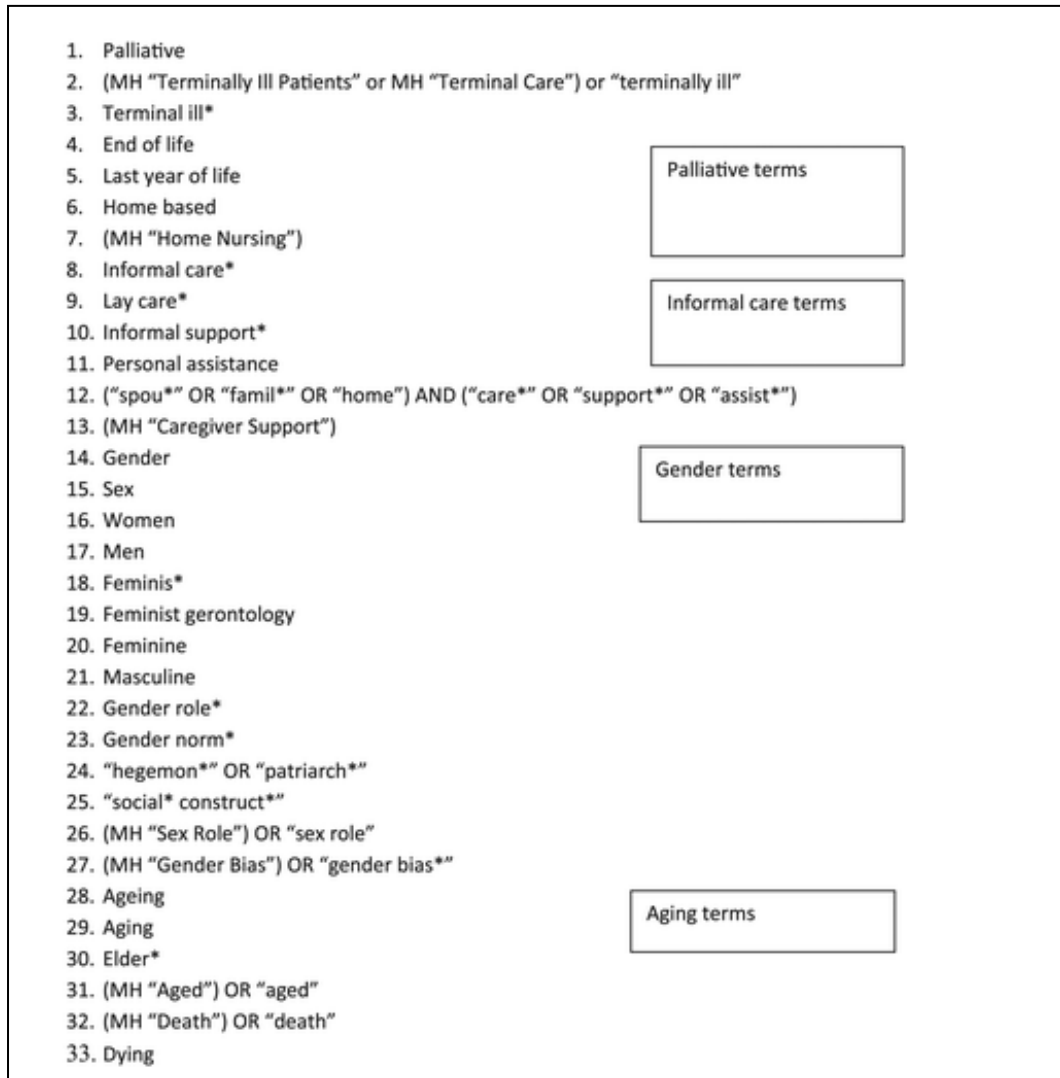
<https://www.library.auckland.ac.nz> > Help > Find a specialist > Subject librarians.

# How to search

Here is an example showing how a plan has translated into the structure of a search in a database

Morgan T, Williams L, Trussardi G, Gott M. Gender and family caregiving at the end-of-life in the context of old age: A systematic review. *Palliat Med.* 2016;30(7):616-24. <http://dx.doi.org/10.1177/0269216315625857>

'we decided to exclude 'female' and 'male' from the search terms because the usage was focused specifically on the biological sex rather than gender, and inflated the search unnecessarily'



## Here are some more examples

Weston PJ, Harris DL, Battin M, Brown J, Hegarty JE, Harding JE. Oral dextrose gel for the treatment of hypoglycaemia in newborn infants. *Cochrane Database Syst Rev.* 2016(5):CD011027.

Hypogly\* AND dextrose gel AND neonat\*

Hartmann-Boyce J, McRobbie H, Bullen C, Begh R, Stead LF, Hajek P. Electronic cigarettes for smoking cessation. *Cochrane Database Syst Rev.* 2016;9:CD010216. doi/10.1002/14651858.CD010216.pub3/full



1. e-cig\$.mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]
2. electr\$ cigar\$.mp.
3. electronic nicotine.mp.
4. (vape or vaper or vapers or vaping).ti,ab.
5. 1 OR 2 OR 3 OR 4

Another review on the same topic:

Malas M, van der Tempel J, Schwartz R, Minichiello A, Lightfoot C, Noormohamed A, et al. Electronic cigarettes for smoking cessation: A systematic review. *Nicotine Tob Res.* 2016;18(10):1926-36.

e-cigarette, "alternative tobacco product", e-cig, "tobacco use cessation product", electronic cigarette, "smoking cessation aid", vape, "electronic nicotine delivery system", vaping, ENDS, vaporizer, e-juice, cartomizer, e-liquid, e-hookah, vape-pen

Marjoribanks J, Ayeleke RO, Farquhar C, Proctor M. Nonsteroidal anti-inflammatory drugs for dysmenorrhoea. *Cochrane Database Syst Rev.* 2015(7):CD001751.

- 1 exp Dysmenorrhoea/
- 2 (Dysmenorrh\$ or primary dymenorrh\$).tw.
- 3 (menstrual adj5 pain).tw.
- 4 (painful adj5 mens\$).tw.
- 5 pelvic pain.tw.
- 6 (menstrual adj5 cramp\$).tw.
- 7 or/1-6
- 8 exp anti-inflammatory agents, non-steroidal/ or exp cyclooxygenase inhibitors/
- 9 (non-steroidal adj5 anti-inflamator\$).tw.
- 10 (non\$steroidal adj5 anti\$inflamator\$).tw.
- 11 nsaid\$.tw.
- 12 exp Cyclooxygenase 2/
- 13 cyclooxygenase\$.tw.
- 14 Cox 2.tw.
- 15 (rofecoxib\$ or valdecoxib\$).tw.
- 16 sulphonanilide\$.tw.
- 17 (etoricoxib\$ or lumiracoxib\$ or parecoxib\$).tw.
- 18 (flufenamic or nimesulide).tw.
- 19 (ampyrone or antipyrine or apazone or aspirin or bufexamac or clofazimine or clonixin or curcumin or dapsone or diclofenac or diflunisal or dipyrone or epirizole or etodolac or fenoprofen or flurbiprofen or glycyrrhizic acid or ibuprofen or indomethacin or ketoprofen or ketorolac or ketorolac tromethamine or meclofenamic acid or mefenamic acid or mesalamine or naproxen or niflumic acid or oxyphenbutazone or pentosan sulfuric polyester or phenylbutazone or piroxicam or prenazone or salicylates or sodium salicylate or sulfasalazine or sulindac or suprofen or tolmetin or cyclooxygenase inhibitors).tw.
- 20 or/8-19
- 21 randomized controlled trial.pt.
- 22 controlled clinical trial.pt.
- 23 randomized.ab.
- 24 randomised.ab.

Siu J, Hill AG, MacCormick AD. Systematic review of reusable versus disposable laparoscopic instruments: costs and safety. *ANZ J Surg.* 2017;87(1-2):28-33.

Key words and Medical subgroup headings (MeSH) terms included: reusable instrument.mp, single-use instrument.mp., disposable instrument.mp., Equipment Reuse/, Disposable Equipment/, Cholecystectomy, Laparoscopic/ or Laparoscopy/,

Surgical Instruments/, Medical Waste Disposal/ or Waste Management/ or Medical Waste/, Environmental Sustainability/ and \*Sterilization/.

## Time saving

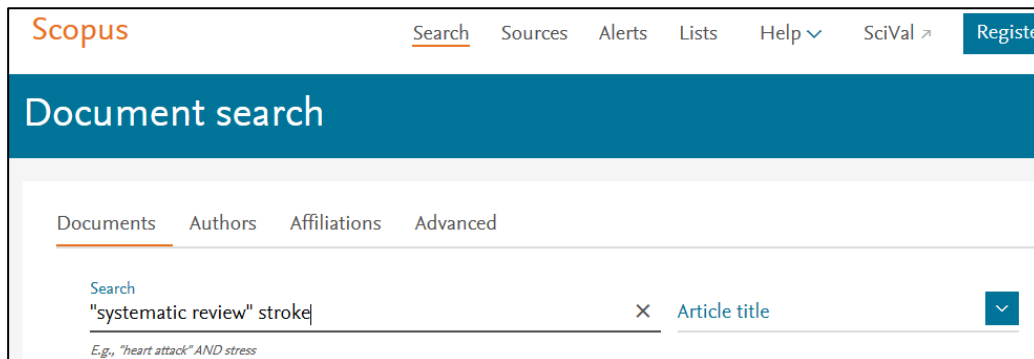
- 1) **Cochrane Collaboration** (<http://www.cochrane.org/>) is a global independent network of researchers, professionals, patients, carers, and people interested in health.

Some of the Cochrane review groups have search strategies that you can use or adapt, eg Cochrane Common Mental Disorders group: <http://cmd.cochrane.org/search-strategies-identification-studies>

Search the **Cochrane library database**. Recent Cochrane systematic reviews **must** include the search strategies.

**TIP:** it can be helpful to search for a Cochrane systematic review that includes at least one aspect of your topic and use or adapt their search strategy.

- 2) Do a quick search in Scopus – “systematic review” and word/s for your topic – and search for the words in the Article title only.



Go to the full text of any relevant articles as searches the authors performed are usually outlined in the Methods section.

- 3) If you already have a relevant article, do a title search in eg Medline or Scopus. If there is a record for the item, click Complete view (Medline) or the article title (Scopus) to see if there are relevant MeSH/subject headings and/or keywords to add to your concept plan and subsequent search strategy.

## Activity

**In your groups, look at the search strategy below and discuss what features of this search are new or unclear to you?**

The following is a search in Medline (Ovid), using both subject headings and keywords. This was the search Dong, Wang and Petrov used to find and select the primary studies which formed the basis of their systematic review.

Dong Z, Xu J, Wang Z, Petrov MS. Stents for the prevention of pancreatic fistula following pancreaticoduodenectomy. *Cochrane Database of Systematic Reviews* 2016, Issue 5. Art. No.: CD008914. DOI: 10.1002/14651858.CD008914.pub3.

## **Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) search strategy (searched from 1946 to November 2015)**

1. exp Pancreaticoduodenectomy/
2. exp Pancreaticojejunostomy/
3. exp Pancreatectomy/
4. (pancreaticoduodenectom\* or pancreatoduodenectom\* or duodenopancreatectom\* or (pancrea\* adj3 duodenectom\*)).tw,kw.
5. (pancreatojejunostom\* or pancreaticojejunostom\* or (pancrea\* adj3 jejunostom\*)).tw,kw.
6. (anastomosis adj3 (pancreatojejunal or jejunopancreatic)).tw,kw.
7. (pancreatogastrostom\* or (pancrea\* adj3 gastrostom\*)).tw,kw.
8. (pancreatectom\* or hemipancreatectom\*).tw,kw.
9. (Whipple and pancrea\*).tw,kw.
10. ("PPD" and pancrea\*).tw,kw.
11. (pancrea\* adj5 (surger\* or operation\* or operated or operative or resect\*)).tw,kw.
12. or/1-11
13. exp Stents/
14. stent\*.mp.
15. exp Catheters/
16. exp Catheterization/
17. (catheter\* or cannula\* or tube\* or pipe\* or "SEMS").tw,kw.
18. (pancreatic duct\* adj5 holder\*).tw,kw.
19. exp Drainage/
20. drainag\*.tw,kw.
21. exp Suction/
22. (suction\* or aspirate\* or aspiration\*).tw,kw.
23. or/13-22
24. 12 and 23
25. exp Fistula/
26. fistula\*.af.
27. leak\*.tw,kw.
28. exp Postoperative Complications/
29. ((postoperat\* or postsurgical or surgical or ((post or after) adj (operat\* or surger\*))) adj5 complication\*).tw,kw.

30. or/25-29
31. 24 and 30
32. randomized controlled trial.pt.
33. controlled clinical trial.pt.
34. randomized.ab.
35. placebo.ab.
36. randomly.ab.
37. trial.ab.
38. groups.ab.
39. or/32-38
40. exp animals/ not humans.sh.
41. 39 not 40
42. 31 and 41

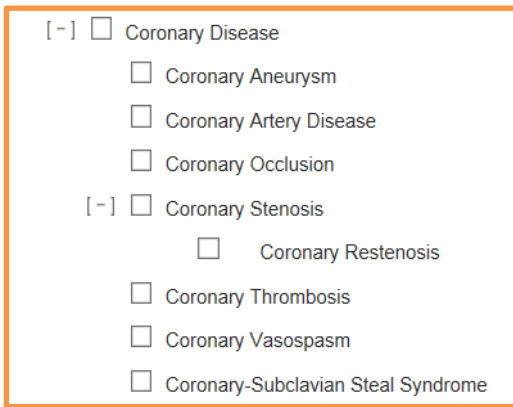
**What features of this search are new or unclear to you?**

## Subject heading search

Some databases use **subject headings** (depending on the database, "subject headings" may be called Subject Terms, Index Terms, Controlled Terms, Descriptors, Thesaurus Terms or MeSH (=Medical Subject Headings)). These are standard terms for particular topics eg, the subject heading **Adolescence** may be applied to all articles about *teenagers, adolescents, youth* and variations of those words.

Some databases arrange their subject headings so you can see related terms grouped together, and pick the ones you want – in Medline this is called a Tree, in Embase and PsycINFO it is called a Thesaurus. The figure below shows the Medline (Ovid) Tree for **Coronary Disease**; headings indented further to the right are called *narrower terms*, representing sub-categories of the term under which they are indented.

## Medline (Ovid) tree



Here is the equivalent Embase Thesaurus, where the heading is **Coronary artery disease**; narrower terms are listed under a heading, rather than being indented.

coronary artery disease	
[Used For]	
	coronary disease
	multivessel coronary artery disease
[Broader Terms]	
	vascular disease
[Narrower Terms]	
	acute coronary syndrome [+NT]
	cardiac allograft vasculopathy
	coronary artery aneurysm
	coronary artery anomaly [+NT]
	coronary artery atherosclerosis
	coronary artery calcification
	coronary artery constriction [+NT]
	coronary artery dissection
	coronary artery obstruction
	coronary artery occlusion [+NT]
	coronary artery perforation
	coronary artery thrombosis
	coronary bifurcation lesion
	coronary subclavian steal syndrome
	Kounis syndrome
	no reflow phenomenon

Science is evolving — new subject headings appear while old subject headings may be absorbed into others or be split into new ones.

Medline, Embase and PsycINFO headings all have **Scope Notes** to give additional details eg:

- definition of the heading (Medline, PsycINFO)
- date a subject heading was first used (Medline, Embase, PsycINFO)
- previous and related subject headings (Medline only)
- "used for" terms (synonyms), useful for finding additional keywords (Medline, Embase).

## Scope note in Medline (Ovid)

Scope Note for: <i>Chocolate</i>
<b>MeSH HEADING:</b> CHOCOLATE
<b>SCOPE:</b> Food product prepared from fermenting, roasting, and grinding the seeds of the COCOA plant.
<b>YEAR of ENTRY:</b> 2017; use CACAO 1963-2016
<b>PREVIOUS INDEXING:</b> Cacao (1963-2016)
<b>REFERENCES:</b>
<b>Used For:</b>
chocolate
chocolates
cocoa powder
cocoa powders
powder, cocoa
powders, cocoa

## Medline record showing subject headings (MeSH)

**Status:** MEDLINE

**Authors:** van de Rest O; Berendsen AA; Haveman-Nies A; de Groot LC.

**Authors Full Name:** van de Rest, Ondine; Berendsen, Agnes Am; Haveman-Nies, Annemien; de Groot, Lisette

**Institution:** van de Rest,Ondine. Division of Human Nutrition, Wageningen University, Wageningen, Th Berendsen,Agnes Am. Division of Human Nutrition, Wageningen University, Wageningen, Haveman-Nies,Annemien. Division of Human Nutrition, Wageningen University, Wagening de Groot,Lisette Cpgm. Division of Human Nutrition, Wageningen University, Wageningen,

**Title:** **Dietary patterns, cognitive decline**, and dementia: a systematic review. [Review]

**Source:** Advances in Nutrition. 6(2):154-68, 2015 Mar.

**Abbreviated Source:** Adv Nutr (Bethesda). 6(2):154-68, 2015 Mar.

**NLM Journal Name:** Advances in nutrition (Bethesda, Md.)

**Publishing Model:** Journal available in: Electronic-Print  
Citation processed from: Internet

**NLM Journal Code:** 101540874

**Other ID:** Source: NLM. PMC4352174 [Available on 03/01/16]

**Journal Subset:** Index Medicus

**Country of Publication:** United States

**MeSH Subject Headings:** \*Alzheimer Disease / pc [Prevention & Control]  
\*Cognition  
\*Cognition Disorders / pc [Prevention & Control]  
Dementia / pc [Prevention & Control]  
\*Diet  
Diet, Mediterranean  
\*Food Habits  
Humans

**Keyword Heading:** Mediterranean diet  
cognitive decline  
dementia  
dietary pattern  
healthy diet

**Abstract:** Nutrition is an important modifiable risk factor that plays a role in the strategy to prevent or individual nutrients and bioactive components. However, the evidence for combined effects growing. These approaches incorporate the complexity of the diet and possible interaction

## Mapping

Ovid databases have a **Map to Subject Heading** feature, so that when you type a search term, you are offered (*mapped to*) one or more possibly useful headings. This feature is always turned on (ticked) when you first start an **Advanced Search**.

Basic Search | Find Citation | Search Tools | Search Fields | **Advanced Search** | Multi-Field Search

1 Resource selected | [Hide](#) | [Change](#)

Ovid MEDLINE(R) Epub Ahead of Print, In Process & Other Non-Indexed Citations, Ovid MEDLINE (R) Daily, and Ovid MEDLINE (R) 1946-Present

Enter keyword or phrase  **Keyword**  Author  Title  Journal

(\* or \$ for truncation)

▼ **Limits** (close)  Include Multimedia  **Map Term to Subject Heading**

## Example:

In Medline (Ovid), type *catheterization* in the search box. The next screen maps to a list of subject headings which contain the word *catheterization*:

Select	Subject Heading
<input type="checkbox"/>	Cardiac Catheterization
<input checked="" type="checkbox"/>	Catheterization
<input type="checkbox"/>	Catheterization, Central Venous
<input type="checkbox"/>	Catheterization, Peripheral
<input type="checkbox"/>	Catheterization, Swan-Ganz
<input type="checkbox"/>	Urinary Catheterization
<input type="checkbox"/>	Intermittent Urethral Catheterization
<input type="checkbox"/>	catheterization.mp. search as Keyword

Note that this may not be a complete list of all relevant headings - there may be some types of catheterization that do not include this word in their name, and so do not show here.

To help find additional relevant headings, always check the **Tree** or **Thesaurus** which, as previously mentioned, is where related subject headings are grouped together for you to pick the ones you want.

To see the Medline (Ovid) **Tree** for Catheterization, click on this heading in the mapping list.

## Tree/Thesaurus

As you can see, the Tree includes other headings for catheterization. The + to the left of some headings indicates there are additional headings (**narrower terms**) included under them; click on each + to see these.

For example, a Tree for *Catheterization*:

[-]	<input checked="" type="checkbox"/>	Catheterization
[+]	<input type="checkbox"/>	Angioplasty
	<input type="checkbox"/>	Balloon Embolectomy
[+]	<input type="checkbox"/>	Balloon Occlusion
	<input type="checkbox"/>	Balloon Valvuloplasty
	<input type="checkbox"/>	Catheterization, Central Venous
[+]	<input type="checkbox"/>	Catheterization, Peripheral
[+]	<input type="checkbox"/>	Cardiac Catheterization
[+]	<input type="checkbox"/>	Urinary Catheterization

### Explode (exp)

Once you have clicked on all the [+] signs and can see headings for all the different types of catheterization, decide which ones to include in your search:

- To include **all of them** - tick the checkbox to the **left** of Catheterization, then ALSO tick the first checkbox to the **right**. This activates the EXPLODE (**EXP**) feature, which automatically includes **all narrower terms** indented under Catheterization. This saves you from having to tick the checkbox for every single heading.

[-]	<input checked="" type="checkbox"/>	Catheterization	48197	<input checked="" type="checkbox"/>
[-]	<input type="checkbox"/>	Angioplasty	6314	<input type="checkbox"/>
[+]	<input type="checkbox"/>	Angioplasty, Balloon	16038	<input type="checkbox"/>
[+]	<input type="checkbox"/>	Angioplasty, Laser	637	<input type="checkbox"/>
[+]	<input type="checkbox"/>	Atherectomy	596	<input type="checkbox"/>
	<input type="checkbox"/>	Balloon Embolectomy	32	<input type="checkbox"/>
[+]	<input type="checkbox"/>	Balloon Occlusion	2613	<input type="checkbox"/>
	<input type="checkbox"/>	Balloon Valvuloplasty	458	<input type="checkbox"/>

- NB: To include only **some** headings, tick the individual checkbox to the left of each one you want. Do NOT put a tick in any of the boxes to the right.

If you use the **explode** feature with Catheterization, it appears like this in your search history:

exp Catheterization/

## More about searching

### Keyword searching

Although this might seem 'overkill' it is usual practice to always double up on search terms by including your subject heading terms as keywords in your search eg

exp Pancreaticoduodenectomy/ or pancreaticoduodenect\*.ti,ab

You should also do keyword searches for variations eg

(pancreatoduodenectom\* or duodenopancreatectom\* or (pancrea\* adj3 duodenectom\*)).tw,kw.

**Untick** the **Map Term to Subject Heading** checkbox to do keyword searches.

### Phrase searching

In Ovid Advanced search, words together are searched as a phrase eg if you type pancreatic duct, Ovid searches exactly these words together.

- No quote marks " " are needed
- Note: In each individual result a yellow highlight colours each occurrence of the individual words eg pancreatic and duct **as well as** the phrase pancreatic duct.

In contrast, when you type words into many other databases (Google, Google Scholar, PubMed, Scopus) you must enclose phrases within quotes ie "pancreatic duct".

Check individual database **Help** or **Search Tips** links for more information.

### Proximity searching

Proximity searching finds results where the given words are near each other.

Ovid databases use adj (adjacent to) followed by a number eg adj3

Examples:

blood pressure adj3 monitor\*

specifies up to two intervening words between blood pressure and monitor\*. The words either side of adj can be in any order. The word monitor\* is in 3<sup>rd</sup> position from the word blood.

Blood pressure adj3 monitor\* will find

- monitoring of blood pressure
- monitoring of elevated blood pressure
- blood pressure monitoring

(pancrea\* adj5 (surger\* or operation\* or operated or operative or resect\*)).tw,kw.



This use of brackets (nesting) ensures any of the words inside the brackets occurs within 5 words of pancrea\*. **Nesting** refers to the use of parentheses to organize a **search** statement that uses more than one kind of connector or operator (AND, OR, ADJ).

## One word or two and hyphens

In Ovid databases a hyphen equals a space. Include the hyphen or omit it but include a space eg post-operative or post operative – either is acceptable.

Combine either of these with the same words treated as one word

Example: post-operative or postoperative

## Truncation symbols and wildcards

A truncation symbol may be used to retrieve variant endings of a search term. However:

- Different databases use different truncation **symbols** eg asterisk (\*) or question mark (?)
- Some databases permit truncation **within** a word or **initially** ... not just at the end
- Some databases use **stemming** ...automatically finding variant verb/noun forms of the searched word.

Ovid databases use truncation and wildcards, but not stemming, eg

- Use the \* to find both singular, plural and variant endings  
Example: diabet\* to search for diabetes, diabetic, diabetics
- Use the optional wildcard ? for zero or one character in British v American spelling  
Example: tumo?r, p?ediatrics
- When in doubt dispense with truncation and wildcards and spell the word and each alternative out in full eg rat or rats (rather than rat\* which will pick up unrelated words such as rate, ratified etc)

Check the database **Help** or **Search Tips** links for more information.

## Field searching

Each search result in a database has a bibliographic record. This record consists of different **fields** — eg, an abstract field, a title field, an author field, a publication type field, etc.

Specialist databases may include fields for particular purposes — eg, Medical Subject Headings (**MeSH**), etc. The record below shows fields from a record in the database **Medline (Ovid)**



## Floating subheadings

Subheadings are aspects of a subject, added to refine their meaning eg a subheading of the subject heading Aspirin is Aspirin/adverse effects. It is rare to use subheadings attached to subject headings for systematic reviews, but subheadings can be searched independently as 'floating subheadings' ie not attached to a particular subject heading. Examples:

su.fs (su=surgery)  
ae.fs (ae=adverse effects)

Search approach	MEDLINE	EMBASE
1: Specified adverse effects	<i>Drug terms AND Exp LIVER DISEASES/ci</i>	<i>Drug terms AND Exp LIVER DISEASE/si</i>
2a: Subheadings linked to drug name indexing terms	<i>Exp VIGABATRIN/ae, po, to</i>	<i>Exp VIGABATRIN/ae, to</i>
2b: Subheadings alone ('floating')	<i>Drug terms AND (ae OR po OR to OR co OR de).fs.</i>	<i>Drug terms AND (ae OR to OR co).fs.</i>
3: Text words for synonyms of 'adverse effects' and related terms	<i>Drug terms AND {safe OR safety OR side-effect<sup>1</sup> OR undesirable effect<sup>1</sup> OR treatment emergent OR tolerability OR toxicity OR adrs OR [adverse adj]<sup>2</sup> (effect or effects or reaction or reactions or event or events or outcome or outcomes)}</i>	
4: Indexing terms for 'adverse effects'	<i>Drug terms AND Exp DRUG TOXICITY/</i>	<i>Drug terms AND (Exp ADVERSE DRUG REACTION/OR Exp SIDE-EFFECT/)</i>
5a: Published search strategies incorporating study design <sup>10</sup>	<i>Drug terms AND [(ae or co or po or de).fs. OR CASE REPORT/]</i>	<i>Drug terms AND [(ae or co).fs. OR CASE REPORT/]</i>
5b: Published search strategies incorporating study design <sup>25</sup>	<i>Drug terms AND (CASE-CONTROL-STUDIES/OR COHORT-STUDIES/OR clinical-trial.pt) OR DRUG INDEXING TERMS/ae</i>	<i>Drug terms AND (Case-control-study OR cohort-study OR clinical trial).de OR DRUG INDEXING TERMS/ae</i>

**Source:** Golder S, McIntosh HM, Duffy S, Glanville J. (2006). Developing efficient search strategies to identify reports of adverse effects in MEDLINE and EMBASE. *Health Information & Libraries Journal*, 23(1), 3-12.

## Filters

Filters are the search strings to add to your topic search to find eg

- specific study or publication types (typically randomised controlled trials for quantitative systematic reviews)
- age groups
- human not animal studies

**Various filters are at:** *Information Skills Online: Searching, writing and presenting skills for the medical and health sciences > Systematic reviews: Doing a systematic review > Filters*  
[https://flexiblelearning.auckland.ac.nz/philson/47\\_8.html](https://flexiblelearning.auckland.ac.nz/philson/47_8.html)

Recommended search filter to remove animal studies:

- **MEDLINE** (search line number) NOT (exp animals/ not humans.sh.)
  - Because new records may not have subject headings consider doing one search line as (mice or rat or rats or sheep or monkey\*).mp and ORing with the search exp animals/ not humans.sh. Then NOT this combined search.
- **Embase** (search line number) NOT ((exp animal/ or nonhuman/) NOT exp human/)

## Limits

Most limits are based on indexing. Use of some limits may result in the elimination of relevant records.

In Ovid databases, some common limits are listed under the search box; there is also an **Additional Limits** button here which leads to menus of other limits. Limits differ depending on the database – always check what is available for each database.

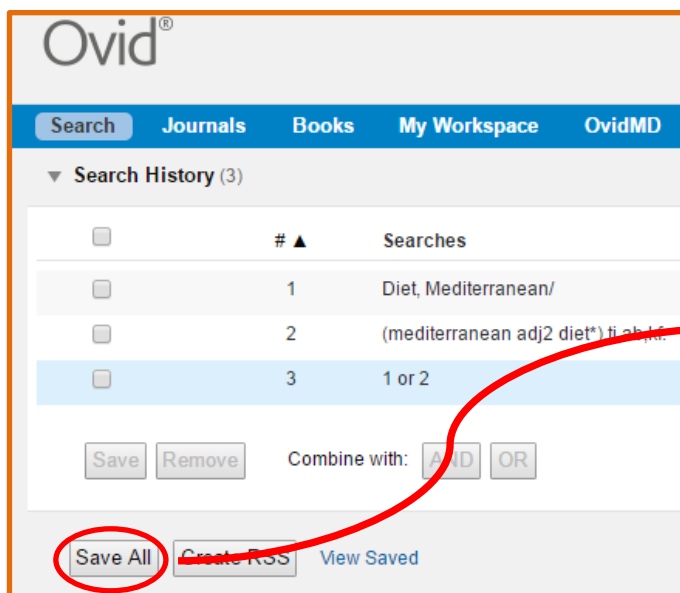
Some of the most useful additional limits are for publication types (eg, randomized controlled trial, controlled clinical trial) and age groups (eg, Adolescence, Aged). These need to be used in conjunction with keywords for the same concept/s.

### TIPS:

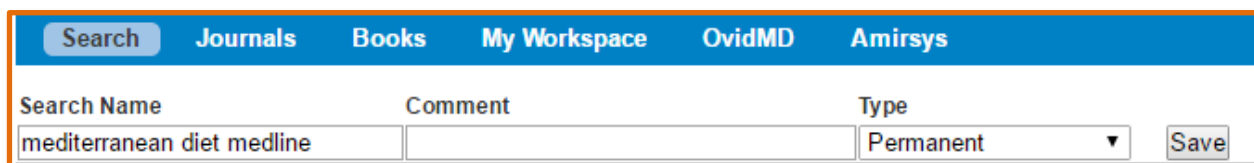
- Never use the Full text limit
- Think very hard about putting a language limit on especially for a systematic review.

## Saving a search

Once you have created a search, or are part way through creating a long search, you may save your search by clicking on the Save all button.



- You will be prompted to sign in with your Ovid account username and password (if you do not have an account yet, click the Create Account link)
- At the saved searches screen give your search a name.
- Make sure to include the name of the database.



## Peer reviewing search strategies

<p>Boolean &amp; proximity operators</p>	<ul style="list-style-type: none"> <li>• Is the use of nesting with brackets appropriate and effective for the search?</li> <li>• Could precision be improved by using proximity operators (eg, adjacent, near, within) or phrase searching instead of AND?</li> <li>• Is the width of proximity operators suitable (eg, might adj5 pick up more variants than adj2)?</li> </ul>
<p>Subject headings (database specific)</p>	<ul style="list-style-type: none"> <li>• Are the subject headings relevant?</li> <li>• Are any relevant subject headings missing; for example, previous index terms?</li> <li>• Are any subject headings too broad or too narrow? Are subject headings exploded where necessary and vice versa?</li> <li>• Are major headings ("starring" or restrict to focus) used? If so, is there adequate justification?</li> <li>• Are subheadings attached to subject headings? (Floating subheadings may be preferred.) Are floating subheadings relevant and used appropriately?</li> <li>• Are both subject headings and terms in free text (see the following) used for each concept?</li> </ul>
<p>Keyword searching</p>	<ul style="list-style-type: none"> <li>• Does the search include all spelling variants in free text (eg, UK vs. US spelling)?</li> <li>• Does the search include all synonyms or antonyms (eg, opposites)?</li> <li>• Does the search capture relevant truncation (ie, is truncation at the correct place)?</li> <li>• Is the truncation too broad or too narrow?</li> <li>• Are acronyms or abbreviations used appropriately? Are the full terms also included?</li> <li>• Are the keywords specific enough or too broad? Are too many or too few keywords used?</li> <li>• Have the appropriate fields been searched; for example, is the choice of the text word fields (.tw.) or all fields (.af.) appropriate? Are there any other fields to be included or excluded (database specific)?</li> <li>• Should any long strings be broken into several shorter search statements?</li> </ul>
<p>Spelling and line numbers</p>	<ul style="list-style-type: none"> <li>• Are there any spelling errors?</li> <li>• Are there incorrect line combinations or orphan lines (ie, lines that are not referred to in the final summation that could indicate an error in an AND or OR statement)?</li> </ul>

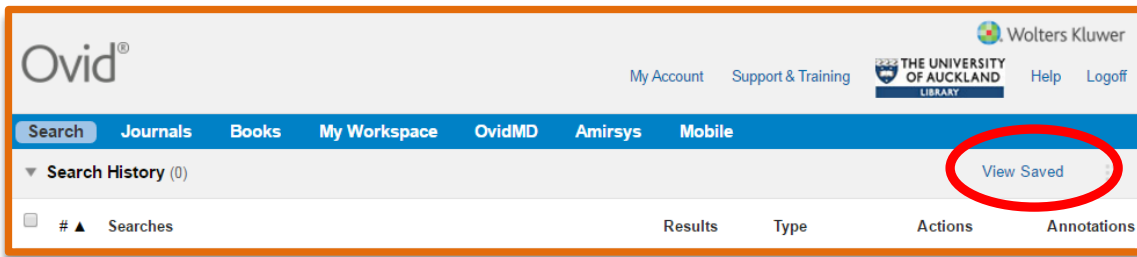
**Source:** McGowan, J., Sampson, M., Salzwedel, D. M., Cogo, E., Foerster, V., & Lefebvre, C. (2016). PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement. *Journal of Clinical Epidemiology*, 75, 40-46. <http://dx.doi.org/10.1016/j.jclinepi.2016.01.021>


**Note:** See the source for the full table.

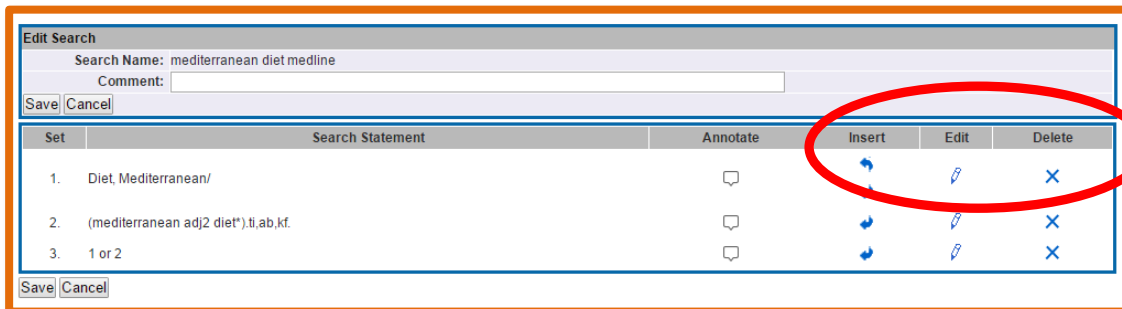
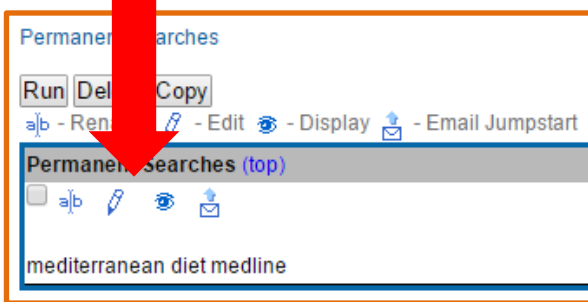
## Editing a saved search

Editing options are available in a **saved search** eg fix spelling mistakes, add in new keywords, insert new lines and delete search lines.

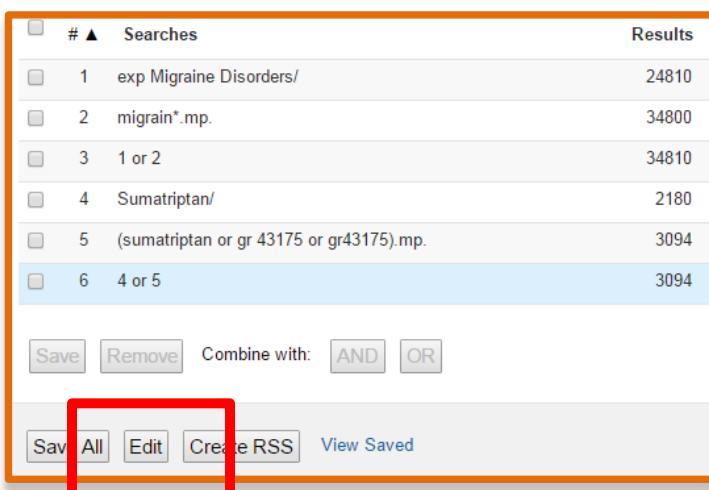
From the Library homepage navigate to the database you want to rerun your search in. Click View Saved to access your saved searches.



Click the  to edit a search.



## Editing while you build a search



A search can be edited while being constructed.

Fix spelling mistakes, add a new word to an existing search line, insert a new or remove a search line.

### Edit Search History

Cancel Run Search

#	Searches	Annotations	Actions
1	exp Migraine Disorders/		
		ance word, subject heading	
		concept word, unique	

(migrain\* or alice in wonderland syndrome).mp.

Cancel OK

## Email alerts

Once your final search is created and saved, set up an email alert so Ovid can **alert** you when *new* results matching your search criteria have been added to that database

Search Name	Comment	Type	
mediterranean diet medline		Permanent	Save
<b>Existing Saved Searches</b>			
<b>Permanent Searches (top)</b>			
1.		AutoAlert (SDI)	
mediterranean diet medline		My Projects	

# Additional to searching the main databases

## Grey literature

Grey literature is the term used for material not controlled by commercial publishers. It includes government department reports, theses and dissertations, policy documents, working papers, census data etc. For more on grey literature see:

**Information Skills Online** ([https://flexiblelearning.auckland.ac.nz/philson/12\\_13.html](https://flexiblelearning.auckland.ac.nz/philson/12_13.html)) > Searching, writing and presenting for the medical and health sciences > Where to search > Grey literature

## Citation databases

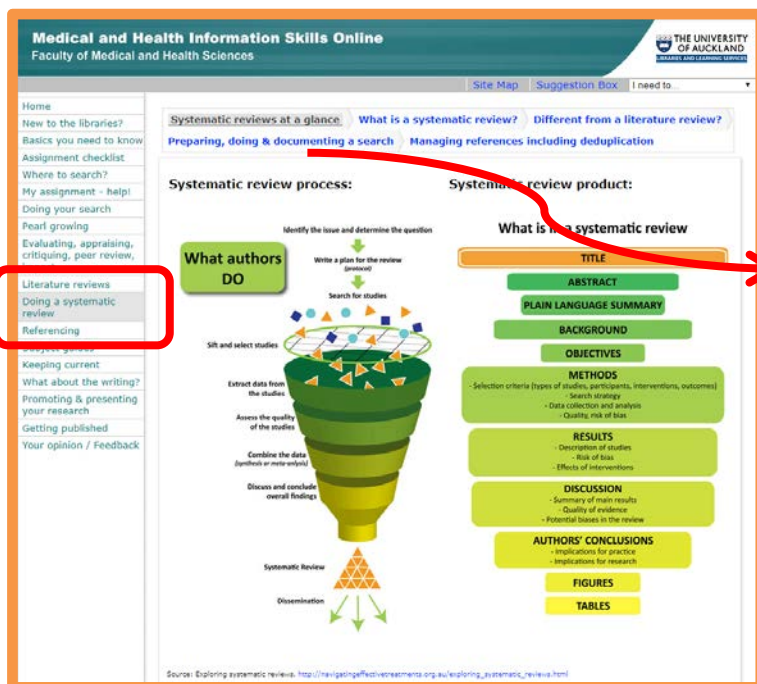
When you have finished your database searching and chosen relevant articles from your search results, two useful methods to check you haven't missed additional relevant articles or grey literature not picked up in your database searches are:

- Look at the reference lists of the relevant articles chosen from your search results.
- Use citation databases to see if the relevant articles have themselves been subsequently cited. Type the article title into:
  - Scopus
  - Web of Science
  - Google Scholar

Both Scopus and Web of Science are useful in that the record for an article usually includes hyperlinks for both reference lists and times cited/cited by.

## Help

<https://flexiblelearning.auckland.ac.nz/philson/47.html>



## Videos

The section Doing a systematic review > Search strategies has useful videos from the Harvey Cushing/John Hay Whitney Medical Library at Yale.

They cover preparing and building search strategies, and validating, verifying and revising searches.

They show how to do your search in the Ovid databases, Scopus and Web of Science.

<http://library.medicine.yale.edu/tutorials/subjects/systematic-reviews>