Doing a systematic review: The search strategies

Learning outcomes

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

- Plan a search
- Know the key databases to search when undertaking a systematic review
- Search some key databases using a variety of advanced techniques to obtain systematic review-related literature
- Peer review a search

November 2019

Contents

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[1].

- 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[2].

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 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 **APA 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.[1]

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 research 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

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 systematic review or a sentence reflecting your topic.

- Underline the key concepts in your sentence above.

Now, start to make a plan or logic grid and 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)
Join different CONCEPTS with AND
Join different SYNONYMS with OR

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

Have you already done some preliminary searching and/or have a relevant paper? Use that paper to find words to add to your search eg

- Author keywords - add relevant ones to your search plan
- If a search strategy is included in a relevant article you can use/modify it. In the article it might say we used these words and we searched these databases - you could use and modify for your search.
- If it is a Cochrane systematic review look in the Appendices for the search strategy to use/adapt/modify for your own systematic review literature search.

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 perform complex searches and save searches to rerun later. 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)

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, OAIster, Open Grey, the NYAM Web site, the Legacy Library, BIOSIS Previews, Conference Papers Index, ISI Proceedings, Dissertation Abstracts International, CIHI, and Grey Net International

At a minimum these databases need to be searched

- Cochrane CENTRAL [Central Register of Controlled Trials] - part of the Cochrane Library - if you are searching for rcts.

- Medline

- Embase

Depending on your topic you may need to search additional databases. See a listing of some of these at https://flexiblelearning.auckland.ac.nz/philson/47_8.html
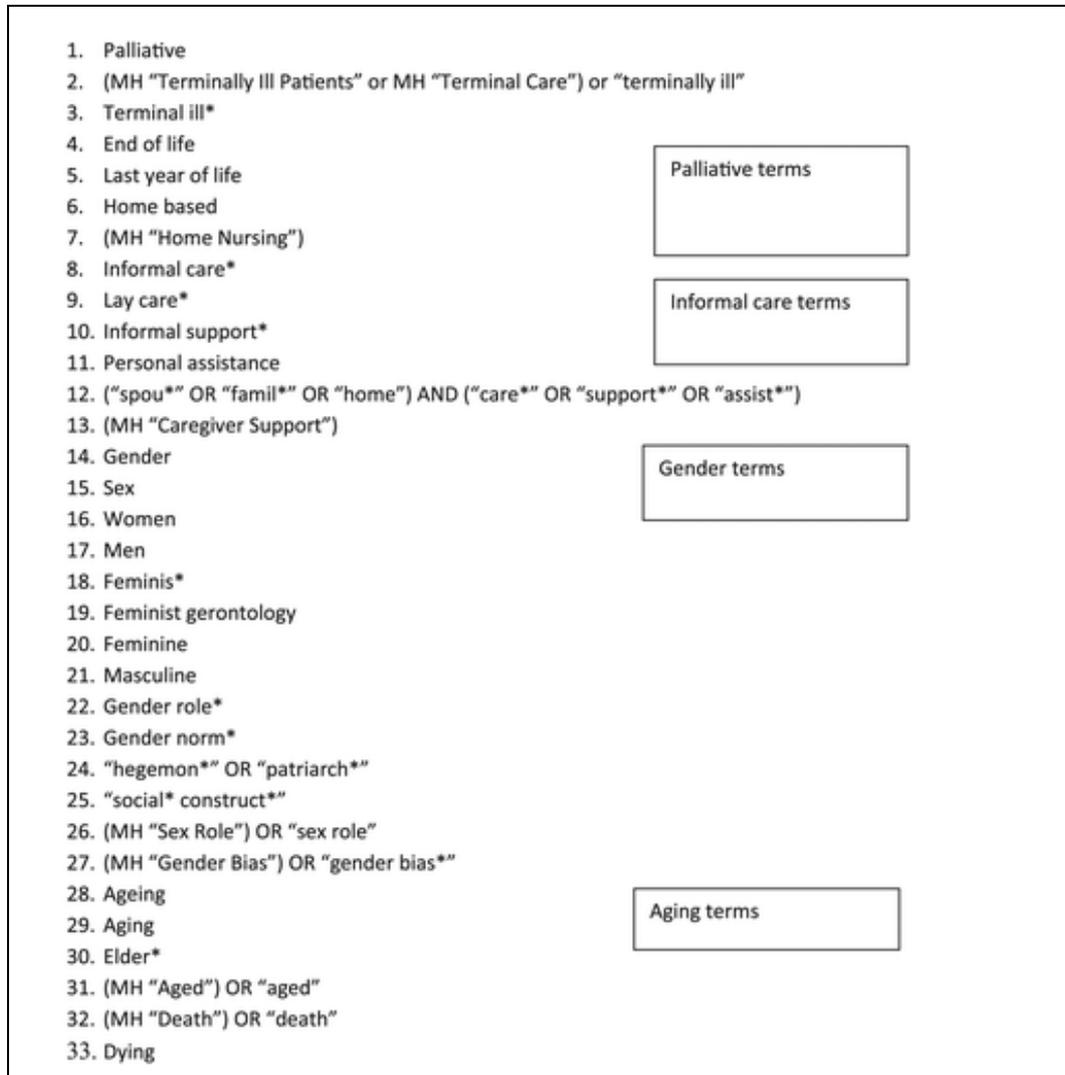
Add the platform to the database name eg Medline (Ovid) when documenting the databases you searched. Ovid, Ebsco and Proquest are platforms that host a number of individual databases.

How to search

Here is an example showing how a plan or logic grid 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'

1. Palliative
2. (MH "Terminally Ill Patients" or MH "Terminal Care") or "terminally ill"
3. Terminal ill*
4. End of life
5. Last year of life   **Palliative terms**
6. Home based
7. (MH "Home Nursing")
8. Informal care*
9. Lay care*   **Informal care terms**
10. Informal support*
11. Personal assistance
12. ("spou*" OR "famil*" OR "home") AND ("care*" OR "support*" OR "assist*")
13. (MH "Caregiver Support")
14. Gender   **Gender terms**
15. Sex
16. Women
17. Men
18. Feminis*
19. Feminist gerontology
20. Feminine
21. Masculine
22. Gender role*
23. Gender norm*
24. "hegemon*" OR "patriarch*"
25. "social* construct*"
26. (MH "Sex Role") OR "sex role"
27. (MH "Gender Bias") OR "gender bias*"
28. Ageing
29. Aging   **Aging terms**
30. Elder*
31. (MH "Aged") OR "aged"
32. (MH "Death") OR "death"
33. Dying

Here are some more examples

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

The following is a good example of how comprehensive a search should be depending on the systematic review topic:

Thomson H, Thomas S, Sellstrom E, Petticrew M. Housing improvements for health and associated socio-economic outcomes. Cochrane Database Syst Rev. 2013(2):CD008657. [Medline (Ovid) search]

1. housing/
2. housing for the elderly/
3. public housing/
4. ((renovat$ or repair$) adj3 (home or homes or house or houses or housing)).ti,ab.
5. ((mite or mites or rat or rats or mouse or mice or cockroach$ or vermin or flea or fleas or infest$) adj3 (home or homes or house or houses or housing)).ti,ab.
6. ((sanitation or sanitary) adj3 (home or homes or house or houses or housing)).ti,ab.
7. ((mold or mould or moldy or mouldy) adj3 (home or homes or house or houses or housing)).ti,ab.
8. ((damp$ or humid$) adj3 (home or homes or house or houses or housing)).ti,ab.
9. (heating adj3 (home or homes or house or houses or housing)).ti,ab.
10. ((retrofit$ or retro fit$) adj3 (home or homes or house or houses or housing)).ti,ab.
11. (ventilation adj3 (home or homes or house or houses or housing)).ti,ab.
12. (insulat$ adj3 (home or homes or house or houses or housing)).ti,ab.
13. (refurbish$ adj3 (home or homes or house or houses or housing)).ti,ab.
14. ((crowd$ or overcrowd$) adj3 (home or homes or house or houses or housing)).ti,ab.
15. (double glaz$ adj3 (home or homes or house or houses or housing)).ti,ab.
16. ((draft$ or draught$) adj3 (home or homes or house or houses or housing)).ti,ab.
17. (allergen$ adj3 (home or homes or house or houses or housing)).ti,ab.
18. Air Pollution, Indoor/
19. indoor air qualit$.ti,ab.
20. (towerblock$ or tower block$).ti,ab.
21. apartment$.ti,ab.
22. (bedsit$ or bed sit$).ti,ab.
23. (highrise$ or high rise$).ti,ab.
24. (multistor$ or multi stor$).ti,ab.
25. (bungalow$ or flats).ti,ab.
26. landlord$.ti,ab.
27. rehous$.ti,ab.
28. (homeowner$ or home owner$ or tenant$ or owner$ occup$).ti,ab.
29. dwellings.ti,ab.
30. squatter$.ti,ab.
31. or/1-30
32. (reduc$ or increas$ or decreas$ or evaluat$ or change$ or changing or intervention$ or grow$).ti,ab.
33. (improv$ or better or worse$ or effect$ or achieve$ or comfort or morale or harmful or impact$ or gain$).ti,ab.
34. 32 or 33
35. ((reduc$ or increas$ or decreas$ or evaluat$ or change$ or changing or intervention$ or grow$ or (improv$ or better or worse$ or effect$ or achieve$ or comfort or morale or harmful or impact$ or gain$)) adj3 housing).ti,ab.
36. 31 and 34
37. 35 or 36
38. homeless$.ti,ab.

39. exp homeless persons/
40. animal housing/
41. or/38-40
42. 37 not 41
43. exp research/
44. exp public policy/
45. exp evaluation studies/
46. exp epidemiologic study characteristics/
47. exp clinical trials/
48. (trial or trials or random$ or controlled or study or studies or intervention$).ti,ab.
49. (program or programs or programme or programmes or research or policy or policies).ti,ab.
50. quasi experimental.ti,ab.
51. longitudinal$.ti,ab.
52. prospective.ti,ab.
53. randomized controlled trial.pt.
54. clinical trial.pt.
55. or/43-54
56. 42 and 55
57. animal/
58. human/
59. 57 not (57 and 58)
60. 56 not 59

Time saving

1) **Cochrane Collaboration** (https://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: https://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.
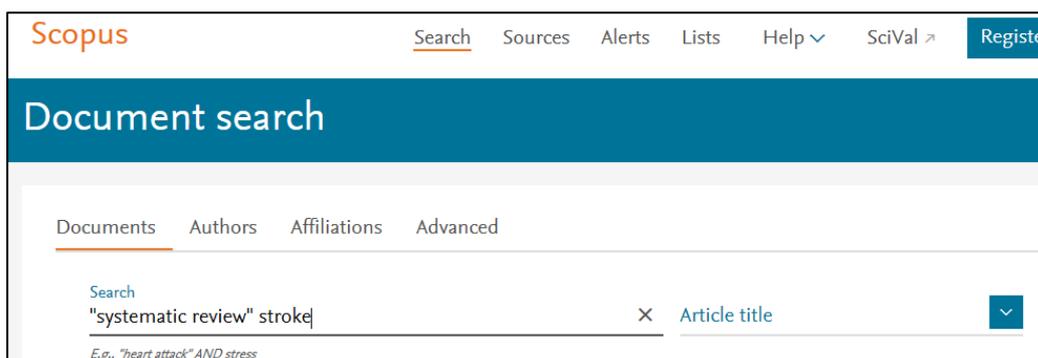
   Go to the full text of any relevant articles as searches the authors performed are usually

outlined in the Methods section and/or included as an Appendix or in Supplementary material.

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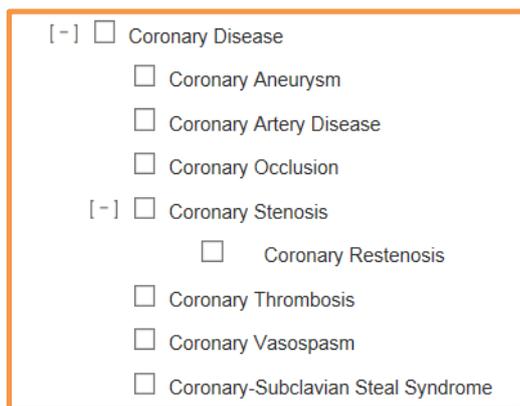
Here is the equivalent Embase Thesaurus, where the heading is **Coronary artery disease**; narrower terms are listed under a heading, rather than being indented.

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 APA PsycINFO headings all have **Scope Notes** to give additional details eg:

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

Subject Heading	Explode	Focus	Scope
Chocolate	☐	☐	ⓘ

Scope note in Medline (Ovid)

Scope Note for: *Chocolate*

  MeSH HEADING: CHOCOLATE

    SCOPE: Food product prepared from fermenting, roasting, and grinding the seeds of the COCOA plant.

    YEAR of ENTRY: 2017; use CACAO 1963-2016

    PREVIOUS INDEXING: Cacao (1963-2016)

REFERENCES:

Used For:
    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.**
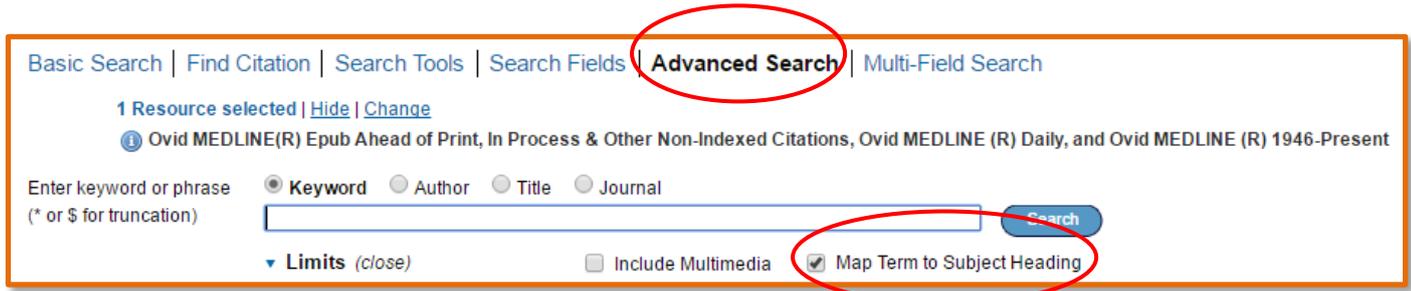
Example:

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

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*:

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.

- 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 3rd 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
                 post-operativ* or postoperativ* to search for post-operative or
                 postoperative or post-operatively or postoperatively
- 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)**

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
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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

Fields are important because they are *searchable*, helping you refine and focus your search.

In Ovid databases the default field for keyword searches is .mp (many places or multiple places including title, abstract, subject heading, plus others). You can also specify exactly which fields to search by adding field label(s) to the end of a keyword, eg:

- .tw (title, abstract)
- .ti,ab (title, abstract)
- .af (all fields)
- .kw (keyword heading contains the exact author keywords.)
  http://ospguides.ovid.com/OSPguides/medline.htm#KW

- .kf (To retrieve every Keyword Heading that includes a particular word, search for the word in the Keyword Heading Word (KF) field'). This is only used in Medline (Ovid)

Example: pancreaticoduodenect*.ti,ab,kw

In Medline, randomized controlled trial is listed in the **Publication Typ**e (.pt.) field and so allows this search: **randomized controlled trial.pt.**
This would be done differently in Embase or PsycINFO.
Note: Embase: For keyword searching use .mp in preference to eg .tw - pancreaticoduodenect*.mp

For a complete list of database fields click *Search Fields*.

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)

Table 1 Examples of search approaches using the OVID interface

Search approach	MEDLINE	EMBASE
1: Specified adverse effects	*Drug terms AND* Exp LIVER DISEASES/ci	*Drug terms AND* Exp LIVER DISEASE/si
2a: Subheadings linked to drug name indexing terms	Exp VIGABATRIN/ae, po, to	Exp VIGABATRIN/ae, to
2b: Subheadings alone ('floating')	*Drug terms AND* (ae OR po OR to OR co OR de).fs.	*Drug terms AND* (ae OR to OR co).fs.
3: Text words for synonyms of 'adverse effects' and related terms	*Drug terms AND* {safe OR safety OR side-effect¶ OR undesirable effect¶ OR treatment emergent OR tolerability OR toxicity OR adrs OR [adverse adj2 (effect or effects or reaction or reactions or event or events or outcome or outcomes)]}	
4: Indexing terms for 'adverse effects'	*Drug terms AND* Exp DRUG TOXICITY/	*Drug terms AND* (Exp ADVERSE DRUG REACTION/OR Exp SIDE-EFFECT/)
5a: Published search strategies incorporating study design[10]	Drug terms AND [(ae or co or po or de).fs. OR CASE REPORT/]	Drug terms AND [(ae or co).fs. OR CASE REPORT/]
5b: Published search strategies incorporating study design[25]	*Drug terms AND* (CASE-CONTROL-STUDIES/OR COHORT-STUDIES/OR clinical-trial.pt) OR DRUG INDEXING TERMS/ae	*Drug terms AND* (Case-control-study OR cohort-study OR clinical trial).de OR DRUG INDEXING TERMS/ae

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 > Preparing, doing & documenting a search > Search strategy & filters*
https://flexiblelearning.auckland.ac.nz/philson/47_8.html

Recommended search filter to remove animal studies:

- **MEDLINE** (search line number) NOT (animals/ not humans.sh.)

- **Embase** (search line number) NOT ((exp animal/ or nonhuman/) NOT exp human/)

- OR in both **Medline** and **Embase** simply Click Additional Limits, scroll to the Special Ovid filters for [Embase or Medline] box and select Humans only.

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 specifically **Special Ovid filters**.

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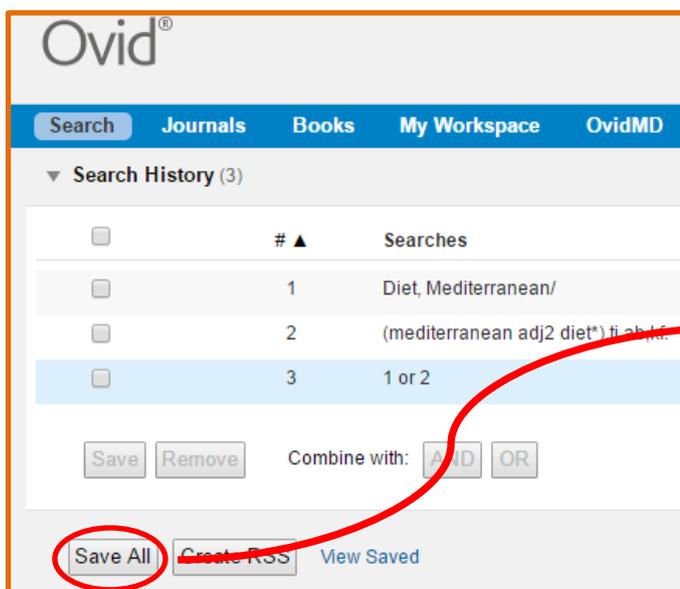
- You will be prompted to sign in with your Ovid account username and password (if you do not have an account yet, click the Create Account link)
- At the saved searches screen give your search a name.
- Make sure to include the name of the database.

| Search | Journals | Books | My Workspace | OvidMD | Amirsys |

| Search Name | Comment | Type | |
| mediterranean diet medline | | Permanent ▼ | Save |

Peer reviewing search strategies

| Boolean & proximity operators	• Is the use of nesting with brackets appropriate and effective for the search? • Could precision be improved by using proximity operators (eg, adjacent, near, within) or phrase searching instead of AND? • Is the width of proximity operators suitable (eg, might adj5 pick up more variants than adj2)?
Subject headings (database specific)	• Are the subject headings relevant? • Are any relevant subject headings missing; for example, previous index terms? • Are any subject headings too broad or too narrow? Are subject headings exploded where necessary and vice versa? • Are major headings (''starring'' or restrict to focus) used? If so, is there adequate justification? • Are subheadings attached to subject headings? (Floating subheadings may be preferred.) Are floating subheadings relevant and used appropriately? • Are both subject headings and terms in free text (see the following) used for each concept?
Keyword searching	• Does the search include all spelling variants in free text (eg, UK vs. US spelling)? • Does the search include all synonyms or antonyms (eg, opposites)? • Does the search capture relevant truncation (ie, is truncation at the correct place)? • Is the truncation too broad or too narrow? • Are acronyms or abbreviations used appropriately? Are the full terms also included? • Are the keywords specific enough or too broad? Are too many or too few keywords used? • 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)? • Should any long strings be broken into several shorter search statements?
Spelling and line numbers	• Are there any spelling errors? • 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)?

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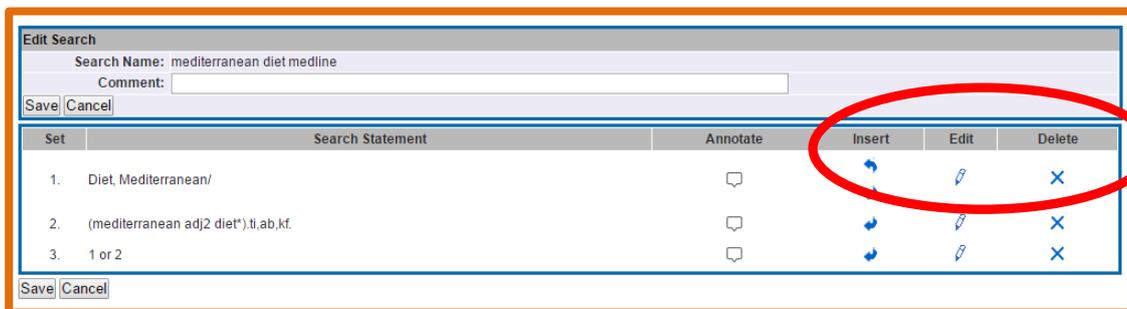
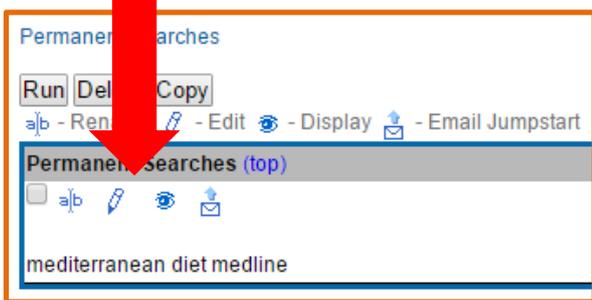**Note**: *See the source for the full table.*

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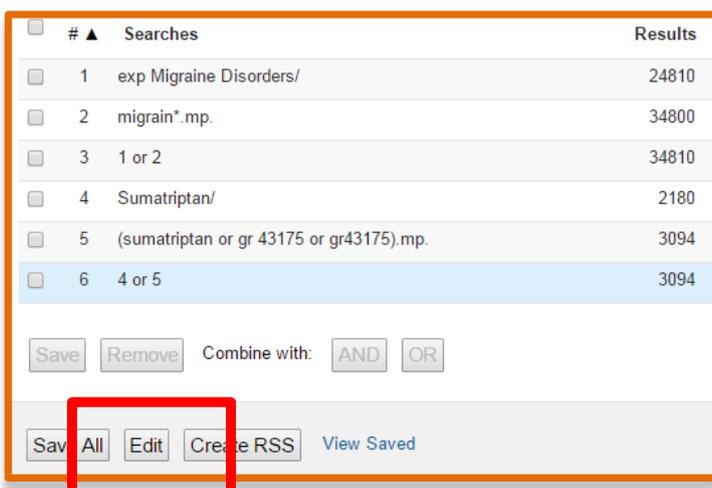
From the Library homepage navigate to the database you want to rerun your search in. Click View Saved to access your saved searches.
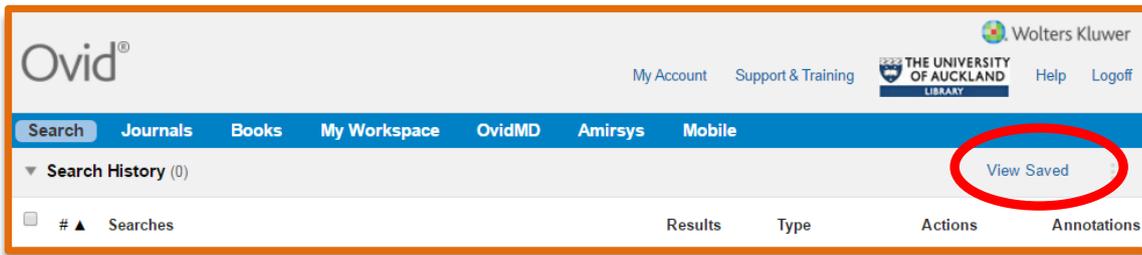
Click the ✏ to edit a search.

Editing 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/	💬	✏ 🖥 🖥 ✕
	...nce word, subject heading ...concept word, unique	💬	✏ 🖥 🖥 ✕
		💬	✏ 🖥 🖥 ✕
		💬	✏ 🖥 🖥 ✕

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

Cancel   OK

...43175 or gl43175).mp.

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
Existing Saved Searches		Temporary (48 hours)	
		Permanent	
Permanent Searches (top)		AutoAlert (SDI)	
1.		My Projects	
mediterranean diet medline			

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) > 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
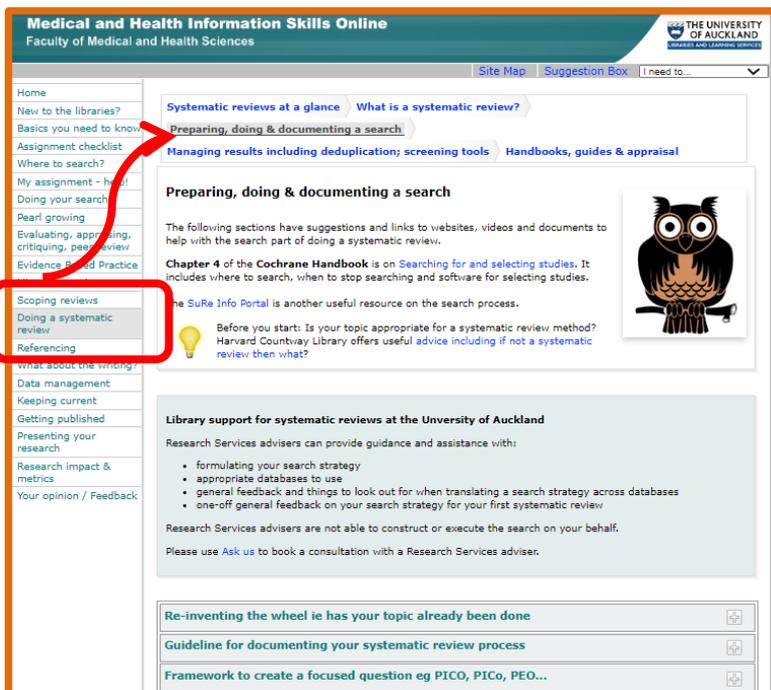
Videos

The section Preparing, doing & documenting a search 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.

https://library.medicine.yale.edu/tutorials/subjects/systematic-searches