

Literature searching:

hints and tips for developing search strategies
and running searches



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Presentation Outline

- * Importance of literature searching
- * Formulating the question/key concepts
- * Identifying sources to search
- * Developing search terms
- * Search syntax
- * Developing the search strategy
- * Conducting the search and downloading the results
- * Reporting search strategies in publications



Importance of literature searching

- * Aim of a literature search is to bring together all available literature on a particular topic, often to answer a specific question
- * Important to retrieve as much as is possible all the relevant papers that exist on your topic
- * If relevant studies are not retrieved by your search strategy this could lead to bias in the conclusions of your research
- * Important to spend time developing a comprehensive set of search terms to ensure that papers are not missed

The literature search underpins the research, particularly for systematic reviews, and so it is crucial to get it right from the start!

Formulating the question/key concepts

Methods/Tools such as those below can help with identifying the key search terms to be included in the search strategy:

* **PICO method**

- * **Population/Patient**
- * **Intervention or exposure**
- * **Comparison**
- * **Outcomes**

* **SPIDER Tool (adaptation of PICO for qualitative and mixed-methods research)**

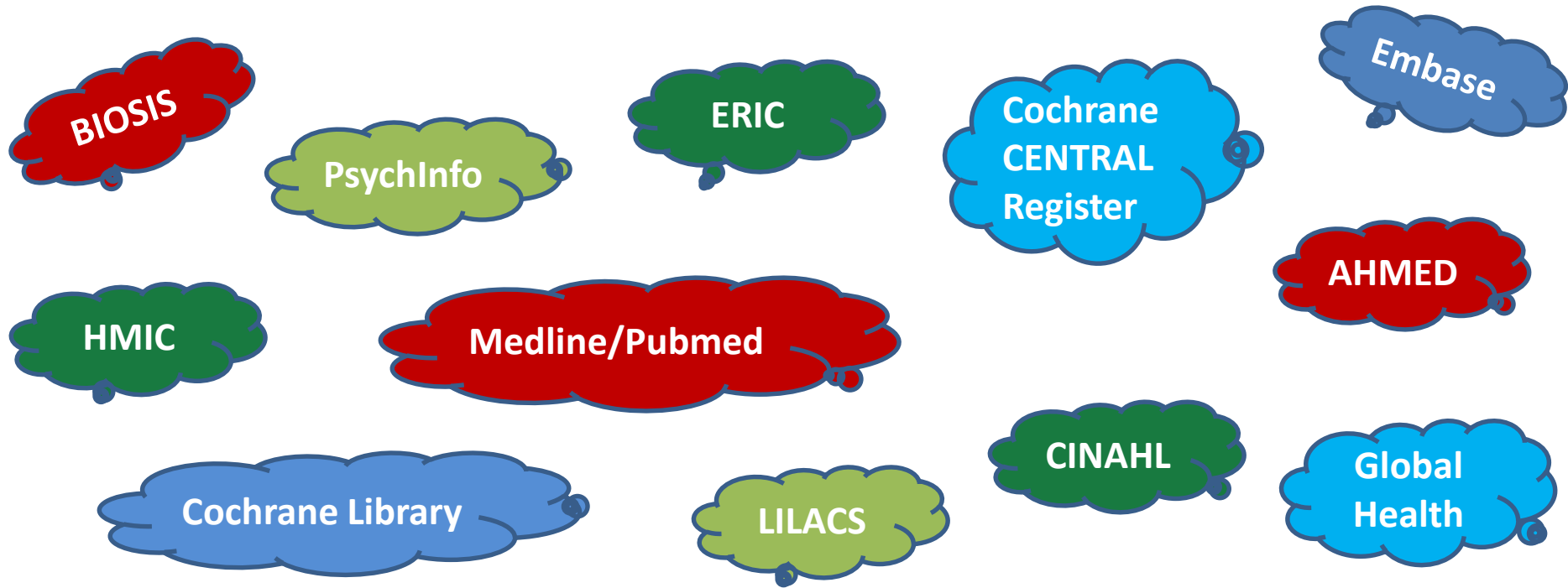
- * **Sample**
- * **Phenomenon of Interest**
- * **Design**
- * **Evaluation**
- * **Research type**

(Cooke, A., Smith, D. & Booth, A. (2012). Beyond PICO: the SPIDER tool for qualitative evidence synthesis. *Qualitative Health Research*, 22(1435). doi: 10.1177/1049732312452938)

Identifying sources to search [1]

- * Identify relevant bibliographic databases (often dependent upon what you have institutional access to)

Key biomedical databases include:



Identifying sources to search [2]

You might also want to consider:

Searching reference lists of included papers

Grey literature databases e.g. OpenGrey


Contacting authors to identify additional unpublished work

Searching clinical trial registers e.g. ISRCTN, WHO ICTRP, Clinical Trials.gov, pharmaceutical industry trial registers

Hand searching journals

Conference abstracts/proceedings

Developing search terms [1]

- * Bibliographic databases are all designed differently and therefore the way that you search them differs
- * Search strategies should include a combination of both free-text and controlled vocabulary terms
- * Controlled vocabularies include for example:
 -  NLM MeSH (Medical Subject Headings) used in a variety of databases including Pubmed, Medline, CINAHL
 - Emtree used in Embase
 - American Psychological Association's Thesaurus of Psychological Index Terms used in PsychInfo
- * Important to spend time exploring the controlled vocabularies available for each database

Developing search terms [2]

Scope Note for: *Venous Thrombosis*

Medline MeSH

MeSH HEADING: VENOUS THROMBOSIS

SCOPE: The formation or presence of a blood clot (THROMBUS) within a vein.

NOTE: general: prefer specifics; coordinate IM with specific vein (IM)

YEAR of ENTRY: 99; use THROMBOPHLEBITIS 1963-98

PREVIOUS INDEXING: Thrombophlebitis (1963-1998)

REFERENCES:

Used For:

venous thromboses
thromboses deep vein
thromboses venous
thrombosis deep-vein
deep venous thrombosis
thrombosis deep-venous
deep-venous thrombosis
deep-venous thromboses
vein thromboses deep
phlebothromboses
venous thromboses deep
thrombosis deep vein
deep-vein thromboses
thrombosis deep venous
deep venous thromboses
thromboses deep-vein
thrombosis venous
thromboses deep venous
deep vein thrombosis
deep-vein thrombosis
venous thrombosis deep
vein thrombosis deep
deep vein thromboses
phlebothrombosis
thromboses deep-venous
venous thrombosis

EMBASE Emtree

Search

Journals

Books

Scope Note for: *deep vein thrombosis*

MAIN TERM: deep vein thrombosis

DATE OF ENTRY: 19740101

SCOPE NOTE:

Used For:

acute deep venous thrombosis
deep thrombophlebitis
deep venous thrombosis
deep venous thrombus
thrombosis,acute deep venous

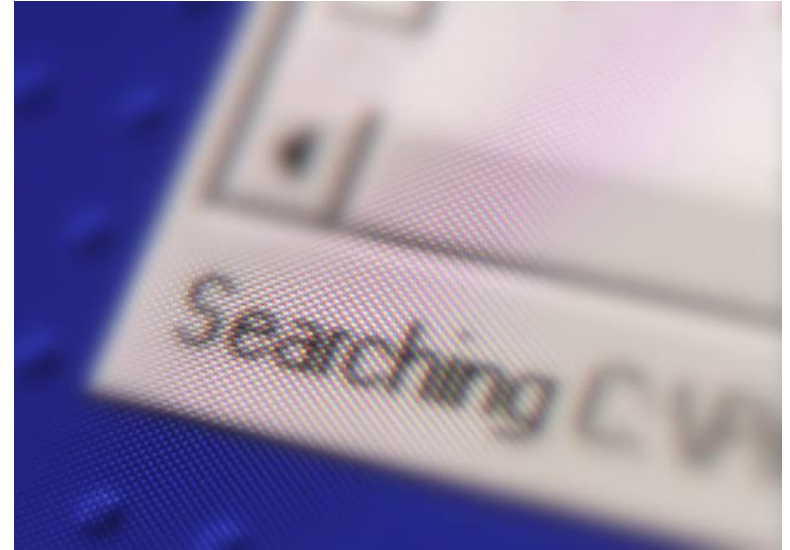
Developing search terms [3]

MEDLINE - controlled vocabulary terms	Free-text terms	EMBASE - controlled vocabulary terms	Free-text terms
Venous Thrombosis Thrombophlebitis Thromboembolism Thrombosis	Thrombus Thrombotic Thrombolic Thromboembolism Thrombosis Thromboprophylaxis	Deep Vein Thrombosis Leg Thrombosis Thrombosis Microthrombus Post Thrombosis Syndrome Thrombus Vein Thrombosis Thromboembolism Thrombophlebitis	Thrombus Thrombotic Thrombolic Thromboembolism Thrombosis Thromboprophylaxis
Bandages	Stockings Hosiery Tights Socks	Bandage Bandages and dressings Compression therapy	Stockings Hosiery Tights Socks

Clarke MJ, Hopewell S, Juszczak E, Eisinga A, Kjeldstrøm M. Compression stockings for preventing deep vein thrombosis in airline passengers. Cochrane Database of Systematic Reviews 2006, Issue 2. Art. No.: CD004002.

Developing search terms [4]

- * Importance of including:
 - * US/UK spelling variants
 - * abbreviations
 - * synonyms
 - * acronyms
 - * phrases



- * Useful to conduct scoping search
- * Use key papers to help identify free-text terms and controlled vocabulary terms assigned by indexers for each database

Developing search terms [5]

Embase bibliographic record

Accession Number	16625594
Authors	Clarke M. , Hopewell S. , Juszczak E. , Eisinga A. , Kjeldstrom M.
Institution	(Clarke, Hopewell, Juszczak, Eisinga, Kjeldstrom) UK Cochran OX2 7LG.
Correspondence Address	M. Clarke, UK Cochrane Centre, Summertown Pavilion, Middle
Country of Publication	United Kingdom
Title	Compression stockings for preventing deep vein thrombosi
Source	Cochrane database of systematic reviews (Online). (2) (pp Cl
Subject Headings	aerospace medicine *aircraft *bandage clinical trial controlled clinical trial edema / et [Etiology] human meta analysis randomized controlled trial review *travel *vein thrombosis / pc [Prevention]

Pubmed bibliographic record

AUTHORS' CONCLUSIONS: Airline passengers sin
compression stockings. We cannot assess the efft
Randomized trials to assess these outcomes wouk

Comment in

Compression stockings to prevent deep vein throml

PMID: 16625594 [PubMed - indexed for MEDLINE]



Publication Types, MeSH Terms

Publication Types

[Meta-Analysis](#)

[Review](#)

MeSH Terms

[Aerospace Medicine](#)

[Aircraft*](#)

[Bandages*](#)

[Edema/etiology](#)

[Humans](#)

[Randomized Controlled Trials as Topic](#)

[Travel*](#)

[Venous Thrombosis/prevention & control*](#)

[LinkOut - more resources](#)

Search syntax [1]

- * Each database uses different syntax for inputting and combining the search terms in the database
- * Best to write out a separate search strategy for each database

Examples of database syntax for searching

Database syntax	Pubmed	Embase (OVID)	CINAHL (EbscoHost)
Title/abstract	[tiab]	.ti,ab.	TI OR AB
Author	[au]	.au.	AU
Controlled vocabulary heading	[mesh]	/	MH
Date limit	[dp]	limit to yr=""	DT

Developing the search strategy [1]

- * Write the search strategy out line by line
- * Decide what fields you want to search for free-text terms in
- * Important to number each line as the line numbers will be used to combine all the search terms within the search strategy
- * Check for typos, mistakes in combining terms or syntax problems
- * Save a copy of the final search strategy – you will need this later when writing up

```
FINAL VERSION search strategy for pubmed RG sear...
File Edit Format View Help
1. reporting guideline* [tiab]
2. guideline* [ti] AND reporting [ti]
3. guidance [tiab] AND reporting [tiab]
4. reporting requirement* [tiab]
5. guideline* [ti] AND publication* [ti]
6. standard* [ti] AND reporting [ti]
7. practice [ti] AND reporting [ti]
8. design [ti] AND reporting [ti]
9. conduct [ti] AND reporting [ti]
10. reporting [ti] AND criteri* [ti]
11. reporting [ti] AND recommendation* [ti]
12. research reporting [tiab]
13. transparen* [tiab] AND reporting [tiab]
14. responsible [ti] AND report* [ti]
15. clarity [ti] AND report* [ti]
16. presentation [ti] AND publication [ti]
17. analys* [ti] AND reporting [ti]
18. presentation [ti] AND standard* [ti]
19. presentation [ti] AND guideline* [ti]
20. minimum information [tiab]
21. reporting [ti] AND method* [ti]
22. reporting [ti] AND experiment* [ti]
23. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8
or #9 or #10 or #11 or #12 or #13 or #14 or #15
or #16 or #17 or #18 or #19 or #20 or #21 or #22
24. Guidelines as Topic [Mesh]
25. Practice Guidelines as Topic [Mesh]
26. Randomized Controlled Trials as
Topic/standards [Mesh]
27. Randomized Controlled Trials as
Topic/methods [Mesh]
28. Randomized Controlled Trials as
Topic/statistics and numerical data [Mesh]
29. Clinical Trials as Topic/standards [Mesh]
30. Clinical Trials as Topic/methods [Mesh]
31. Clinical Trials as Topic/statistics and
numerical data [Mesh]
32. Meta-Analysis as Topic [Mesh]
33. Periodicals as Topic [Mesh]
34. Research Design [Mesh]
35. Guideline Adherence [Mesh]
36. Consensus [Mesh]
37. Publishing/standards [Mesh]
38. Publications/standards [Mesh]
39. Writing/standards [Mesh]
40. Evidence-Based Practice/standards [Mesh]
41. Evidence-Based Practice/methods [Mesh]
42. Evidence-Based Medicine [Mesh]
43. Sensitivity and specificity [Mesh]
44. Reproducibility of results [Mesh]
```

Developing the search strategy [2]

At this stage you might also want to think about:

- * Applying limits such as date or language limits
- * How you will combine the search terms
- * Using a search filter to focus your search to retrieve particular study types including: adverse events; RCTs; diagnostic studies; guidelines; observational studies; prognosis; qualitative research; systematic reviews etc.
A list is available from the CRD website:
<https://sites.google.com/a/york.ac.uk/issg-search-filters-resource/home>



Example search strategy

Appendix 2. MEDLINE (January 1966 to November 2005)

Clarke MJ, Hopewell S, Juszczak E, Eisinga A, Kjeldstrøm M. Compression stockings for preventing deep vein thrombosis in airline passengers. Cochrane Database of Systematic Reviews 2006, Issue 2. Art. No.: CD004002.

Search strategy

- 1 AEROSPACE MEDICINE/
- 2 TRAVEL/
- 3 AIRCRAFT/
- 4 AVIATION/
- 5 TRANSPORTATION/
- 6 (aviation or aviator\$ or airline\$ or aeroplane\$ or aircraft\$ or plane\$ or flying or flight\$ or travel\$ or passenger\$).ti,ab.
- 7 (long-haul or long haul or long-distance\$ or long distance\$ or non-stop or non stop or non-stop).ti,ab.
- 8 (economy class or coach class or economy seat\$).ti,ab.
- 9 (sedentar\$ or sitting or seated or inactiv\$ or immobil\$).ti,ab.
- 10 or/1-9
- 11 BANDAGES/
- 12 (stocking\$ or hosiery or tights or sock\$).ti,ab.
- 13 or/11-12
- 14 VENOUS THROMBOSIS/
- 15 THROMBOPHLEBITIS/
- 16 THROMBOEMBOLISM/
- 17 THROMBOSIS/
- 18 (thromboprophyla\$ or thrombus or thrombotic or thrombolic or thromboemboli\$ or thrombos\$).ti,ab.
- 19 (blood flow stasis or vein stasis or venous stasis or blood clot\$ or dvt).ti,ab.
- 20 or/14-19
- 21 10 and (13 or 20)

Controlled vocabulary headings

Searching for free-text terms in the title or abstract fields

Terms combined with 'and' or 'or' to give final results set

Conducting the search & downloading the results

Things to consider:

- * Run the search by copying and pasting each line separately into the database search box
- * Check that each line of the search runs properly in the database
- * If available save the search history in case you need to re-run it at a later date
- * Save a copy of the exact search strategy that you run on each of the databases - you will need to report this in any publications
- * Choose the correct output format when downloading the results
- * Use the correct filter when importing to reference management software and make sure that all the results are imported correctly

Reporting search strategies

When reporting the literature search you should generally include:

- * Copy of the entire search strategy for each database
- * Date that the search was conducted on each database
- * The search platform used e.g. OVID or EbscoHost
- * The exact version of the database e.g. Embase 1996 to 2014 Week 36
- * The total number of results retrieved

Useful resources

- * Booth A. "Brimful of STARLITE": toward standards for reporting literature searches. J Med Libr Assoc. 2006;94(4):421-429, e205.
- * Cochrane guidelines for reporting literature searches in systematic reviews
- * PRISMA guidelines



Key messages

- * Invest time in planning the search, identifying terms and developing the search strategy
- * Set aside enough time to run the search, download the results and import them into reference management software
- * Ensure that you save the search strategy used for each database and record the search details and total results retrieved
- * Remember that if important papers are not found by your search strategy and cannot therefore be included in your research then the results of your study may be invalid
- * Speak to a librarian!



Thank you!

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