

The Literature Search Process: Protocols for Researchers

Developed by South Central Healthcare Librarians*

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Introduction

This document has been developed by health librarians in close partnership with the Thames Valley Research & Development Network. Its aim is to support healthcare researchers in carrying out effective literature searches according to an agreed set of recommendations. This will help ensure that research is not duplicated and that literature searches retrieve the best available evidence.

This document provides guidance for the following key steps:

- planning a literature search
- identifying key sources of information
- guidance in carrying out an effective literature search
- documenting the search process

Structured guidance and a checklist column are provided for each section so that researchers can quickly identify and tick off the necessary elements. Your local healthcare librarian will be able to help you to work through this document and offer professional advice and support in carrying out your literature search. To find out the contact details for your local healthcare library, please visit <http://www.library.nhs.uk/mylibrary>

This work builds on previous international work in this area, which is credited in the bibliography.

This is a working document that will evolve to meet the needs of the local research community; therefore your feedback is of the utmost importance. A feedback form for comments and suggestions is provided at the end of the document.

If you would like to discuss the contents of this document further, please contact:

Sarah Lewis, Clinical Librarian, Ravenswood House and Royal South Hants Hospital.
Tel: 0118 9605016, email: Sarah.Lewis@hantspt-sw.nhs.uk

Nia Wyn Roberts, Librarian, Oxford University Health Care Libraries.
Tel 01865 289409, email: nia.roberts@hcl.ox.ac.uk

*Past and present members of the group who have contributed to this work: Chrissy Allott, Liz Callow, Richard Comley, Jill Duncan, Lucy Gilham, Eve Hollis, Marie Hickman, Beverly Hixon, Jo Hunter, Belinda Hylton, Jennie Kelson, Fran Lamusse, Carol Lefebvre, Sarah Lewis, Gill McGlashan, Fiona MacLean, Lesley Martyn, Kath Osborn, Rowena Perry, Tatjana Petrinic, Nia Roberts, Laura Strafford, Elaine Watson, Helen Williams.

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Search Planning Form

Use this form to identify/clarify the key concepts and the scope of your research topic.
 For each section, refer to the **guidance notes** on the following page for further explanation.

Name: _____

Date search started: _____

Date search completed: _____

1. Your Research Topic

2. Consider how the following four categories apply to your research topic

Patient/Population and/or Problem	Intervention	Comparison/Control <i>(if applicable)</i>	Outcomes (or Effects)
Alternative Words			

3. Your Research Question

4. Any Search Restrictions

Guidance notes for use with Search Planning Form

1. Your Research Topic – briefly describe in your own words the key aspects of your research topic

2. Consider how the following four categories apply to your research topic: Patient/population and/or problem, Intervention, Comparison and Outcome. These categories form the PICO model (Richardson, 1995), an evidence-based model for formulating a clinical question. By dividing your concepts into these categories, you will also be doing the groundwork for developing a search strategy. If the PICO model is not appropriate for your topic, there are alternatives, such as ECLIPSE (Wildridge, 2002), or you may like to adapt the PICO headings to fit the type of research you are undertaking. Your librarian may be able to advise you further.

- **Patient/Population and/or Problem** - any characteristics that define your patient or population, e.g. target clinical condition, co-existing condition, ethnicity, age group
- **Intervention** - what you want to do with the patient/population/problem e.g. form of treatment, diagnostic test, education programme, type of service delivery. This can also include any exposures (e.g. asbestos) or factors influencing prognosis.
- **Comparison/Control Intervention** (if applicable) – alternative(s) to main intervention, e.g. placebo
- **Outcomes or effects** - any outcomes or effects relating to the intervention e.g. prevention, side effects, morbidity, quality of life, cost-effectiveness

When filling in each category, consider any alternative keywords that could be used, taking into account differences in terminology, spelling etc - refer to the guidance notes in section 2a of the checklist (page 7) for more information.

Example

Patient/Population and/or Problem	Intervention	Comparison/Control Intervention (if applicable)	Outcome (or effects)
acute stroke	blood pressure reduction	no treatment	secondary prevention
OR↓	OR↓	OR↓	OR↓
Alternative Words			
cerebrovascular accident cerebrovascular event ischaemic stroke	anti-hypertensive agents hypertension - drug therapy diuretics, atenolol etc lowering blood pressure	placebo	secondary prophylaxis reduce mortality risk reduction

AND/OR - When searching bibliographical databases such as MEDLINE, similar concepts (i.e. terms in the same column) are combined with OR e.g. blood pressure OR hypertension. You may need to create a separate column if there is more than one concept associated with any of the PICO headings. Different concepts (i.e. terms in separate columns) are combined with AND, e.g. stroke AND blood pressure reduction

3. Your Research Question – your research topic phrased as a question, incorporating the elements identified in the PICO (or similar) model. *Example:* in people with a prior history of stroke, is blood pressure reduction more effective than no treatment in preventing future stroke events?

4. Any Search Restrictions – anything related to your topic that you wish to exclude. To avoid bias, use generic limitations only where strictly necessary e.g. avoid restrictions such as limiting to UK studies only, studies published since 2000, or English language only.

	<ul style="list-style-type: none"> • Websites of relevant associations, societies, centres of excellence, royal colleges & government bodies 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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		Searched	N/A	Unavail-able
<p>1) Resource Checklist (continued)</p>	<p>b) Other core resources:</p> <ul style="list-style-type: none"> • Bandolier • BioMed Central • Clinical Evidence * • Clinical Knowledge Summaries • Evidence-based gateways e.g. Intute, NLH, TRIP database • Drug Information <ul style="list-style-type: none"> a) Drug and Therapeutics Bulletin * b) National electronic Library for Medicines c) National Prescribing Centre (including MeReC bulletins) e) Pharmaceutical and device manufacturers 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>Level 2: Recommended resources Some of these resources may help to locate unpublished literature including theses & conference proceedings.</p> <p>They are useful if you need a greater level of confidence that you are not duplicating other research. However, access to some of these sources may be limited.</p> <p>* Resources marked with a * are not available through the NHS core content collection or freely available on the Internet. Access is through subscription only, but may be accessible at your local health or academic library.</p>	<p>LEVEL 2: RECOMMENDED RESOURCES</p> <ul style="list-style-type: none"> • British Library's Electronic Table of Contents (Zetoc) – journals conference proceedings * • Contacting centres of excellence and experts in the field • Dissertation Abstracts * • Index to Theses* • Library catalogues (to locate theses etc.) • Networked Digital Library of Theses and Dissertations (NDLTD) • References cited by retrieved research papers • Science Citation Index (SCI) * • Social Sciences Citation Index (SSCI) * • Web search engines, e.g. Google (<i>contact your librarian for advice in focusing and evaluating the quality of your results</i>) • World Health Organisation Regional Databases 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>Level 3: Additional resources These resources will further increase the comprehensiveness of your search. N.B. you may want to weigh up the likelihood of locating significantly new information before investing the time needed to explore these methods.</p>	<p>LEVEL 3 : ADDITIONAL RESOURCES</p> <ul style="list-style-type: none"> • Email / online discussion groups • Hand searching of key journals 	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

2) Search Strategy Checklist

<p>Before carrying out your search you will need to identify your research question and plan your search strategy. You will already have identified your research question and broken it down into different concepts when completing the Search Planning Form.</p> <p>This section will help you identify a range of keywords relevant to your research question. It includes essential search techniques that should be used, wherever possible, to carry out an effective search of your chosen sources. Contact your librarian for further advice / training, if required.</p>		
<p>Guidance notes</p> <p><i>Often, initial searches will highlight other appropriate text words (words or phrases that might appear in the text of an article) and database subject headings.</i></p> <p><i>Therefore, it is useful to carry out a pilot search in each database and review your search terms (and if necessary, your research question and its scope) before carrying out your final searches.</i></p>	<p>a) Range of search terms</p> <p>Identify a range of search terms for each of your identified search concepts, considering:</p> <ul style="list-style-type: none"> • Synonyms, e.g. <i>aged; elderly</i> • Acronyms, e.g. <i>AIDS, CHD</i> etc. • Differences in terminology across national boundaries, e.g. <i>Accident and Emergency / Emergency Room</i> • Differences in spellings, e.g. <i>anaemia / anemia</i> • Old and new terminology, e.g. <i>mongolism / down syndrome</i> • Brand and generic names, e.g. <i>coumadin / warfarin</i> • Lay and medical terminology e.g. <i>stroke / cerebrovascular accident</i> 	<p>Used / Identified</p> <p style="text-align: right;"><input type="checkbox"/></p>
<p><i>Subject headings are used to index the content of most bibliographic databases (MEDLINE, EMBASE etc.) Example: heart attack is indexed under MYOCARDIAL INFARCTION</i></p> <p><i>The subject headings list used in MEDLINE is called MeSH (Medical Subject Headings).</i></p> <p><i>Look for the MeSH or Thesaurus options to identify the most appropriate subject heading for the keyword you have entered.</i></p> <p><i>Correct use of subject headings improves the accuracy of your results and is essential to an effective search. See section 2c).</i></p> <p>See next page for continued guidance notes.</p>	<p>b) Database subject headings</p> <ul style="list-style-type: none"> • Identify appropriate subject headings for each database used • Check coverage, scope and definition of each subject heading <p>NB: Sometimes subject headings are not defined as you might expect, e.g. the MeSH heading "SURGERY" is used to index material on the <u>discipline</u> of surgery, not surgical <u>procedures</u> (this is indexed under SURGICAL PROCEDURES, OPERATIVE).</p>	<p style="text-align: right;"><input type="checkbox"/></p> <p style="text-align: right;"><input type="checkbox"/></p>

2) <u>Search Strategy Checklist</u> (<i>continued</i>)	c) Search techniques	Used / Identified	N/A
<p>Guidance Notes</p> <p><i>Most of these search techniques are for use with bibliographic databases, e.g. MEDLINE. If a particular search technique is not applicable, tick the box in the N/A column.</i></p> <p>Truncation symbols vary depending on the service provider. The most common are:</p> <p>\$ (e.g. databases provided by Dialog DataStar such as MEDLINE, CINAHL etc.)</p> <p>* (e.g. Cochrane Library)</p> <p>Combining search results</p> <p>Use AND to combine two <u>different</u> concepts, e.g. <i>diabetes AND insulin</i></p> <p>(<i>this will narrow your search – your results must include ALL your stated concepts</i>)</p> <p>Use OR to search for <u>similar</u> concepts, e.g. <i>retina OR eye</i></p> <p>(<i>OR will widen your search - your results will include a MINIMUM OF ONE of your named concepts</i>)</p> <p>Updating searches: <i>this process can have many pitfalls. If you have a pre-prepared search that you wish to update or re-run at a later date, please contact your librarian.</i></p>	<p>• Carry out separate searches for each individual concept and then combine at a later stage</p> <p style="margin-left: 2em;"><i>Example search</i></p> <ol style="list-style-type: none"> 1. diabetic OR diabetes 2. retina OR eye 3. 1 AND 2 <p>• Use a combination of text words (free text) and subject heading searches</p> <p>• Use appropriate truncation for text word searches where applicable, e.g. <i>nurs\$</i> to find <i>nurse, nurses, nursing</i> etc.</p> <p>• ‘Explode’ (i.e. expand) database subject headings where appropriate to include narrower terms</p> <p>• Avoid restricting database subject heading searches using the ‘<i>major descriptors</i>’ or ‘<i>subheading</i>’ options in the first instance (to avoid missing relevant material)</p> <p>• Use AND / OR appropriately to combine results of separate searches</p> <p>• Avoid limiting your search to English language (to help prevent bias)</p> <p>• When searching websites or other electronic sources, use the ‘Advanced’ search option where available</p> <p>• If appropriate, use search filters (pre-prepared search strategies) to identify particular types of research studies e.g. randomised controlled trials. Try PubMed’s Clinical Queries or contact a librarian for advice.</p> <p>• Use the PubMed ‘related articles’ function and lists of references in CINAHL</p> <p>• Check the references cited in any research / other relevant material retrieved</p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>

3) Search Documentation Checklist

Guidance Notes	Please ensure your research proposal includes:	Included
<p><i>This checklist outlines the minimum required to document the search process carried out in support of any research proposal.</i></p> <p><i>All elements must be clearly documented for each resource searched.</i></p> <p><i>See the Guide to Sources of Information in the Appendices for details of each resource listed in the checklist.</i></p>	a) Clearly stated research question	<input type="checkbox"/>
	b) Explanation of the scope of the research question	<input type="checkbox"/>
	c) For <u>database searches</u> , specification of the following:	
	<ul style="list-style-type: none"> • Title of database searched (e.g. MEDLINE) 	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Name of the database provider (e.g. Dialog DataStar) 	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Date search conducted 	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Complete search strategy used. <p><i>Attach print outs of search strategies for each database used</i></p>	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Dates covered by the search (e.g. 1990-present) 	<input type="checkbox"/>
	d) For specific <u>websites</u> (other than online databases above), specification of the following:	
	<ul style="list-style-type: none"> • Name of the resource, (e.g. metaRegister of Controlled Trials) 	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Publisher of the resource (e.g. US National Library of Medicine) 	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Web address (URL) 	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Search terms used 	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Date accessed 	<input type="checkbox"/>
	e) For <u>search engine</u> searches, specification of the following:	
<ul style="list-style-type: none"> • Search engines used (when searching across the Internet, e.g. Google, or searching within a website, e.g. National Library for Health) 	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Web address 	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Search terms used 	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Date searched 	<input type="checkbox"/>	

Literature Search Protocols Feedback Form

If you have any comments or suggestions as to how this checklist can be improved, please complete and return this brief feedback form. Your feedback will be highly valuable in ensuring that this document evolves to meet your needs. Thank you in advance.

1. How useful have the following sections of the checklist been in planning and carrying out your literature review? (Please select the most appropriate box in the scale)

	not at all useful	1	2	3	4	highly useful
Search Planning Form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Section 1: Resource checklist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Section 2: Search Strategy checklist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Section 3: Search documentation checklist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Guide to sources of information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How effective was the checklist in helping you to: (Please select the most appropriate box in the scale)

	not at all effective	1	2	3	4	highly effective
Plan your literature search?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Document your literature search?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Save time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you ticked 1 or 2 for any of the above, please indicate your reasons why:

3. How could the checklist be made more effective for you?

4. Has a librarian given you any assistance in the use of the checklist? Yes No

5. If you have any further comments/suggestions, please note them in the space below:

Please return this form to: Nia Wyn Roberts, Librarian, Oxford University Health Care Library, Old Road Campus Library, Headington, Oxford OX3 7LF. Tel 01865 289409, email: nia.roberts@hcl.ox.ac.uk