

The Literature Search Process: Guidance for NHS Researchers

Developed by South Central Healthcare Librarians*

Version: 3.0

Issue date: October 2009

Review date: January 2011

Introduction

This document was developed in partnership with the Thames Valley Research & Development Network and is maintained by healthcare librarians in South Central. Its aim is to support NHS researchers in carrying out effective literature searches. 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. You are strongly encouraged to contact your local healthcare librarian at the start of your research project, they will be able to offer professional advice and support. To find your local library, please visit <http://www.library.nhs.uk/mylibrary/default.aspx>

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 NHS research community; therefore your feedback is of the utmost importance. Please contact us with comments and suggestions.

Sarah Lewis, Clinical Librarian, Ravenswood House and Royal South Hants Hospital.
Tel: 02380 825491, 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

This guidance has been updated in memory of Belinda Hylton, librarian at Buckinghamshire Shared Services who was one of the original main authors.

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

With grateful acknowledgements to: Claire Cheong-Leen, Steve Fairman, Funmi Fajemisin, Geoff Fleet, Annette Hackett, Jessica Thomas, Val Trinder and delegates of the 2nd Thames Valley R&D Network Workshop, Oxford, 15th July 2004.

CONTENTS

	<i>Page</i>
Search Planning Form	3
Guidance Notes for Use with Search Planning Form	4
Literature Search Protocols	
Section 1. <u>Resource checklist</u>	
Level 1: Core resources	5
a) Minimum core resources	5
b) Other core resources	6
Level 2: Recommended resources	6
Level 3: Additional resources	6
Section 2. <u>Search strategy checklist</u>	
a) Range of search terms	7
b) Database subject headings	7
c) Search techniques	8
Section 3. <u>Search documentation checklist</u>	9
Section 4. <u>Research notes</u>	10
 Appendices – see separate document	
1. Bibliography	i
2. Guide to sources of information	ii

Search Planning Form

Use this form to identify/clarify the key concepts and the scope of your research topic.

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/Exposure	Comparison/Control <i>(if applicable)</i>	Outcome
Alternative Words			

3. Your Research Question

--

4. Search limits

Study type:	
Age range:	
Publication date:	
Language:	
Other:	

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, you may like to adapt the PICO headings to fit the type of research you are undertaking. Your local healthcare librarian will be able to advise you further.

- **Patient/Population/Problem** - any characteristics that define your patient or population, e.g. target clinical condition, co-existing condition, ethnicity, age group
- **Intervention/Exposure** - 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** (if applicable) – alternative(s) to main intervention, e.g. placebo
- **Outcomes** - 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 synonyms, alternative keywords, different spellings, acronyms etc. to include in your search strategy - see *guidance notes on page 7 for more information.*

Example

P	I	C	O
acute stroke	blood pressure reduction	no treatment	secondary prevention
OR↓	OR↓	OR↓	OR↓
cerebrovascular accident cerebrovascular event ischaemic stroke	Alternative Words anti-hypertensive agents hypertension - drug therapy diuretics, atenolol etc lowering blood pressure	placebo	secondary prophylaxis reduce mortality risk reduction

Combining terms - When searching bibliographical databases such as MEDLINE you will need to use OR/AND to put your search together:

OR – to combine keywords for similar concepts (i.e. terms in the *same* column) use OR e.g. blood pressure OR hypertension.

AND – to combine keywords for different concepts (i.e. terms in *separate* columns) use 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. Generic limits (language, publication date etc) may introduce bias, avoid using these limits if you need a systematic search.

The Literature Search Process: Protocols for Researchers

1) **Resource Checklist:** Please note: this list is not exhaustive – your local healthcare librarian can advise on other relevant resources. Refer to the **Guide to sources of information** (Appendix 2) for further details about subject coverage and access.

Guidance notes	LEVEL 1: CORE RESOURCES	Searched	N/A	Unavail- able
<p>The resource checklist is divided into 3 levels: core, recommended and additional. Alongside each resource, tick the appropriate column: searched, not applicable (N/A) or unavailable.</p> <p>Level 1 – core resources</p> <p>Effective searches across these sources will help ensure that your literature review covers a significant proportion of published research.</p> <p>Consider how retrospective the search needs to be, e.g. from the time when a drug was introduced; also consider whether the coverage of your source is sufficiently retrospective and/or up-to-date.</p> <p>These resources should be searched as a minimum requirement unless they are not appropriate to your research topic. If there are time constraints, section a) minimum core resources should be given priority.</p> <p>How far you proceed beyond Level 1 will depend on:</p> <ul style="list-style-type: none"> • The subject of your research • The type of studies you need to locate (e.g. RCTs) • The time available • Availability of sources • How essential it is to ensure your research is not duplicating research elsewhere <p>* Resources marked with a * are not available through NHS Athens or free on the Internet. Access is through subscription only, but may be accessible at your local health or academic library.</p> <p>See next page for continued guidance notes.</p>	<p>a) Minimum core resources:</p> <ul style="list-style-type: none"> • Cochrane Library • Centre for Reviews and Dissemination (CRD) for latest updates • MEDLINE OR PubMed • EMBASE • Subject specific databases as appropriate: see Appendix 2 <ul style="list-style-type: none"> a) AMED b) ASSIA* c) BIOSIS* d) BNI e) Campbell Library f) ChildData * g) CINAHL h) ERIC i) HMIC j) OTseeker k) PeDRO l) PsycINFO m) Social Care Online 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<p>b) Other core resources:</p> <ul style="list-style-type: none"> • BioMed Central • Evidence summaries e.g. Clinical Evidence *, Clinical Knowledge Summaries • Evidence-based gateways e.g. Intute, NHS Evidence, TRIP • Guidelines sites e.g. NHS Evidence, NICE • Websites of relevant associations / bodies 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1) Resource Checklist (continued)		Searched	N/A	Unavail- able
<p>Level 2: Recommended resources</p> <p><i>Some of these resources may help to locate unpublished literature including theses & conference proceedings.</i></p> <p><i>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.</i></p> <p><i>* Resources marked with a * are not available through NHS Athens or free on the Internet. Access is through subscription only, but may be accessible at your local health or academic library.</i></p>	<p>LEVEL 2: RECOMMENDED RESOURCES</p> <ul style="list-style-type: none"> • Global Health * • Health Business Elite • Science Citation Index (SCI) * • Social Sciences Citation Index (SSCI) * • Conference proceedings <ul style="list-style-type: none"> a) ZeTOC b) SCI * & SSCI * • Drug Information <ul style="list-style-type: none"> a) Drug and Therapeutics Bulletin * b) National electronic Library for Medicines (includes NPC) c) Pharmaceutical and device manufacturers • Dissertations and Theses <ul style="list-style-type: none"> a) Dissertation and Theses Database * b) Index to Theses* c) Networked Digital Library of Theses and Dissertations • Unpublished Studies <ul style="list-style-type: none"> a) NIHR CRN Portfolio Database and NRR Archive b) metaRegister of Controlled Trials (mRCT) c) ClinicalTrials.gov • Library catalogues • Web search engines, e.g. Google • World Health Organisation Regional Databases 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Level 3: Additional resources</p> <p><i>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.</i></p> <p>See next page for continued guidance notes.</p>	<p>LEVEL 3 : ADDITIONAL SEARCH METHODS</p> <ul style="list-style-type: none"> • Contacting centres of excellence and experts in the field • Email / online discussion groups • Hand searching of key journals • Citation tracking / reference list checking 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2) Search Strategy Checklist

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.

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 local healthcare librarian for further advice / training

Guidance notes	a) Range of search terms	Used / Identified
<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>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> 	<input type="checkbox"/>
<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>	<input type="checkbox"/> <input type="checkbox"/>

<p>2) Search Strategy Checklist (continued)</p> <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><i>Truncation symbols vary depending on the service provider. The most common is * which is used in all databases provided by the NLH such as CINAHL and Medline. Other databases may use \$ or ? to represent different numbers of characters so you need to check the help files.</i></p> <p>Combining search results</p> <p><i>Use AND to combine two different concepts, e.g. diabetes AND insulin</i></p> <p><i>(AND will narrow your search – your results must include ALL your stated concepts)</i></p> <p><i>Use OR to search for similar concepts, e.g. 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 local healthcare librarian.</i></p>	<p>c) Search techniques</p> <ul style="list-style-type: none"> • Carry out separate searches for each individual concept and then combine at a later stage <p style="text-align: center;"><i>Example search</i></p> <ol style="list-style-type: none"> 1. diabetic OR diabetes 2. retina OR eye 3. 1 AND 2 <ul style="list-style-type: none"> • Use a combination of text words (free text) and subject heading searches • Use appropriate truncation for text word searches where applicable, e.g. nurs* to find nurse, nurses, nursing etc. • ‘Explode’ (i.e. expand) database subject headings where appropriate to include narrower terms • Avoid restricting database subject heading searches using the ‘major descriptors’ or ‘subheading’ options in the first instance (to avoid missing relevant material) • Use AND / OR appropriately to combine results of separate searches • Avoid limiting your search to English language (to help prevent bias) • When searching websites or other electronic sources, use the ‘Advanced’ search option where available • 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, see the Cochrane Library Handbook or contact your local healthcare librarian for advice. • Use the PubMed ‘related articles’ function and lists of references in CINAHL • Check the references cited in any research / other relevant material retrieved 	<p>Used / Identified</p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p>	<p>N/A</p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><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>	<p>a) Clearly stated research question</p> <p>b) Explanation of the scope of the research question</p> <p>c) For <u>database searches</u>, specification of the following:</p> <ul style="list-style-type: none"> • Title of database searched (e.g. MEDLINE) • Name of the database provider (e.g. NHS Health Information Resources Search 2.0) • Date search conducted • Complete search strategy used. <i>Attach print outs of search strategies for each database used</i> • Dates covered by the search (e.g. 1990-present) <p>d) For specific <u>websites</u> (other than online databases above), specification of the following:</p> <ul style="list-style-type: none"> • Name of the resource, (e.g. metaRegister of Controlled Trials) • Publisher of the resource (e.g. US National Library of Medicine) • Web address (URL) • Search terms used • Date accessed <p>e) For <u>search engine searches</u>, specification of the following:</p> <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) • Web address • Search terms used • Date searched 	<p style="text-align: center;">Included</p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p> <p style="text-align: center;"><input type="checkbox"/></p>

4) Research Notes: