A step-by-step guide to searching for literature

Step 1   **Why are you searching?**

Be clear about the purpose for which you are searching. If you want a few references to use, then you will be able to use more specific terms and it won't matter if you miss some useful references. However if you want to try and be comprehensive, either because you want to find as much as possible or because you think there won't be a lot of references on your topic, then you will need to use broader terms and fewer concepts. This will likely mean that you will find things that are not relevant but you will reduce the chance of missing important references.

Step 2   **Break down your search question into concepts**

Each concept should be an individual idea. So for example, if you were doing a search about whether vitamin C prevents the common cold, these are the concepts that you could identify in your search:
1) Vitamin C
2) Prevention of infection
3) Common cold

You could use one of the tools available to assist in this process. The most well know is PICO – which stands for: Population (or patient), Intervention, Comparison (or control), Outcome. So in the example above, the PICO breakdown would be:

Population: There is no specific population – just people generally
Intervention: Vitamin C
Comparison: There is no specific comparison – just not taking vitamin C
Outcome: Fewer cases of the common cold

If you were doing a search on whether green tea is more effective than coffee in weight loss in overweight men in the UK, then your PICO breakdown would be:

Population: Overweight men in the UK
Intervention: Green tea
Comparison: Coffee
Outcome: Amount of weight lost

While PICO is the most well-known tool of this type, it doesn't always fit the search topic. Other such tools are available. For example, if you're looking for qualitative research you could try either SPICE or SPIDER. ECLIPSE is useful for health service management questions. An explanation of these alternatives can be found in appendix 1.

Step 3   **Rank the concepts in order of importance**

Once you have identified all of the concepts in your search, it is then helpful to rank them. If you find too few references, this will help you to know which concept you can leave out while still finding relevant results.

In the example above, you might decide that the overweight men don't necessarily have to be UK based if including that part would give you too few results. Alternatively you might consider whether other types of drinks might be relevant.

Step 4   **Think of different terms/spellings for each concept**

It also helps if you can think of alternative ways of describing the same concepts. This might be words or terms that have the same or a similar meaning, or it might be a different spelling of the same word. To be more comprehensive in searching, it is essential to include as many alternative terms (synonyms) for each concept as possible.

Examples:
If you are searching for 'Vitamin C', search also for 'Ascorbic acid'.
If you are searching for 'Myocardial infarction', search also for 'heart attack'.
If you are searching for 'children', you might also want to search also for 'young people', 'teenagers', 'neonates', 'child health, 'infants' and 'paediatrics'.
If you are searching for 'paediatrics', search also for 'pediatrics'.

Step 5   **Choose the right resource(s)**

Once you have made your search plan, you can then start to search for information on your topic. Different resources will allow you to find different types of information. This guide focuses on searching the main healthcare databases – which mainly provide details of books and journal articles but not the fulltext of them.

We list the most reliable information resources on our website:
www.uhl-library.nhs.uk/resources

Where to look for other types of information

Guidelines	Local Trust guideline libraries, TRIP database
Systematic reviews	Cochrane Library, TRIP Database, Individual healthcare databases
Evidence summaries	All NHS staff: BMJ Best Practice, TRIP Database, Knowledge & Library Hub UHL staff only: UpToDate , DynaMed

Healthcare databases
NHS access to the main healthcare databases (e.g. Medline, Embase, PsycINFO, CINAHL) is no longer provided by a single interface. These databases contain references to literature from all over the world – some of which is not in English. You get access to them via three different interfaces, links to which you can find on the databases section on our website:
www.uhl-library.nhs.uk/databases

Log in to the databases using your NHS Athens account. (If you do not have an NHS Athens account, you can self-register for one here: www.uhl-library.nhs.uk/athens)

If you are asked to select a database, we suggest that you search each one individually, rather than more than one at the same time. You will do a better search by searching them individually.

It is important to choose the right database for the search you're doing. Here is a brief overview:

Medline	Covers all aspects of international healthcare.
PubMed	The public version of the Medline database. Includes the very latest publications slightly before Medline.
EMBASE	Covers all aspects of international healthcare. Particularly strong in medicines information.
PsycINFO	Psychology, psychiatry and related fields.
CINAHL	Worldwide nursing and allied health.
Emcare	Nursing and allied health research from all over the world.
British Nursing Index (BNI)	British nursing, including midwifery & health visiting.
AMED	Allied and complementary medicine.
HMIC	Health management and administration.

Step 6 **Start searching**

Here are some of the different search methods and techniques that you can use. For advice or further explanation, just get in touch with one of the library team. We advise to take one concept at a time and put each term on a different search line.

Please note that different databases/interfaces might work in slightly different ways (e.g. how it looks for multiple words in keyword searching or different symbols for truncation searching). It is good practice to check the search help/tips for a database before starting to search.

Basic keyword search
Simply put a word or phrase in the search box and click on the search button. This will make the database look for the word(s) in the article records. It may default to searching the title and abstract, which is usually the most appropriate way to search but you will be able to change the fields that are searched.

If you put more than one word in the search box, the database will look for both words, but may not require them all to be together or in the order you entered them.

Search ID#	Search Terms	Search Options	Actions
S1	vitamin c	**Expanders** - Apply equivalent subjects **Search modes** - Boolean/Phrase	View Results (40,805) View Details Edit

In this example in Ebsco's version of Medline, we find that there are 40,805 articles in the database where both the words 'vitamin' and 'c' appear in the default fields, but they are not necessarily together or in that order.

Phrase keyword searching
If you want to specifically search for a phrase (two or more words together and in the specified order) then you can enter the words within quotation marks " " to instruct the database to do this. See line 2 below for an example.

	Search ID#	Search Terms	Search Options	Actions		
☐	S1	📶 vitamin c	**Expanders** - Apply equivalent subjects **Search modes** - Boolean/Phrase	🔍 **View Results** (40,805)	ⓘ **View Details**	✏️ **Edit**
☐	S2	📶 "vitamin c"	**Expanders** - Apply equivalent subjects **Search modes** - Boolean/Phrase	🔍 **View Results** (39,664)	ⓘ **View Details**	✏️ **Edit**

This will find fewer results than basic keyword searching because it is a more specific way of searching. In this example, all of the results in line number 2 will also be in line number 1 as well.

If the number of results was the same in both lines, it would mean that the search without quotation marks was defaulting to phrase searching.

Truncation keyword searching
Sometimes you want to search for multiple words which start in the same way e.g. gene, genetic, genetics and genetically. Rather than having to search for all of these words individually, you can use the common start of the word and then use the truncation symbol. The symbol used might vary between interfaces, but is usually either a * or a $. It might also only search for a certain number of letters after the truncation symbol. Check the search help/tips to be certain.

So, for example, searching for: child*
Would find results containing the words: child, children, childhood, childish, childless, childlike, childproof, childcare etc. But may not include 'childbearing' if it only allowed 5 characters after a *

Subject heading searching
If the concept that you are searching for has a lot of alternative terms or synonyms, it can be difficult to think of all the keywords that should be used. To help with this problem, most databases use an indexing system. This means that if you search using the tags (called subject headings or thesaurus terms), you can find articles related to those subjects even if the authors use different ways to talk about the same concept.

For example, if you want to search for articles to do with children, there are a large number of words that could describe that concept: young people, adolescents, children, neonates, new-borns, teenagers, child health, paediatrics, paediatrics and so on.

If a database uses the American spelling of paediatrics as its subject heading (tag) for the concept of children, then it will be added to the record of the article. Even if it was written by British authors, set in Britain, published in a British journal and never even mentions the word paediatrics of any spelling, they will still assign the 'pediatrics' subject heading to it.

To search using subject headings, enter a term in the search box and then look for an option to use subject headings/terms or the thesaurus.

'Thesaurus' is the name for the list of subject headings that the database uses. This process will ask the database to match your term to one of its tags.

We recommend searching for one concept at a time, and only using one search line for each term.

Combining search lines
Each search line will be a standalone search. There will be no relationships put in between them automatically. You need to decide how they relate to each other.

The relationships are created mainly using the options 'AND' and 'OR'.

OR	- Includes <u>one or other</u> of the selected search lines but not all - Used to combine alternative terms or synonyms - Increases the number of results

AND	- Includes <u>all</u> of the selected search lines - Used to combine different concepts together - Reduces the number of results

Example search: Does drinking alcohol cause cancer?

Concept 1: alcohol
alcohol OR alcoholic OR wine OR beer

Concept 2: cancer
cancer OR neoplasms OR "malignant growth" OR tumour

The search would then be completed by putting both concepts together:

<div align="center">

alcohol OR alcoholic OR wine OR beer
AND
cancer OR neoplasms OR "malignant growth" OR tumour

</div>

This will only leave the results with any of the words used to describe alcohol as well as any of them used to describe cancer.

Limits
You can usually limit your searches in various ways, including language, publication year or article type. Most databases give pre-set options for limiting your search results in such ways.

Look for options to limit your search or refine your results.

As each search interface is different, remember to check the search help/tips for the one you are using, or look at the corresponding guide for that interface on our website:
www.uhl-library.nhs.uk/training

Step 7   **Evaluate information found**

Not everything you read is true. Just because an article may have been peer-reviewed and published, it doesn't make it good quality. A systematic review is high-quality evidence…if it has followed a good methodology and been done carefully.

It is important to evaluate and appraise the information that you find especially if you are going to use it to change your clinical practice.

Here are some things to consider when you evaluate the information that you find.

Currency	How old is this information? When was it last updated? Do any links work?
Relevance	Is this what I need? Is it at the right level? Are you happy using this information for your assignment / research / work?
Authority	Who wrote this? What are their qualifications? Which organisation does it come from?

Accuracy	Does it give a balanced view? Has it been reviewed by someone else? Are links provided to supporting information?
Purpose	What is the purpose of the information? Is it designed to sell or promote something, or to educate? Does it appear to be impartial?

Fulltext **How to get the fulltext of articles found**

Resources like Medline, EMBASE, PsycINFO and CINAHL are 'bibliographic databases'. This means that they list the details of a huge number of articles from a large number of journals. Because they have such wide coverage, they cannot provide the fulltext of the articles that they list.

You may see some fulltext links underneath references in the databases, but if you want to check our holdings, it is worth copying and pasting an article title into the Knowledge & Library Hub which should give you reliable information and give you the links to get the fulltext.

The hubs can be found at:

UHL OpenAthens account holders: www.uhl-library.nhs.uk/hub
LPT/primary care OpenAthens account holders: www.uhl-library.nhs.uk/lpthub

Top tips

We recommend the following:
- **Search each database separately**
  You will be able to use subject headings and therefore do a better quality search.

- **Search for each concept separately**
  It is easier to start with your most important concept, searching for all the terms you can for this concept, before moving on to the next concept.

- **Keep each term on a separate line**
  This will allow the most flexibility. If you have another term for the same concept, keep them on separate search lines and combine them together later.

- **Search in an appropriate way for what you want to find**
  If you want your search to be comprehensive, perhaps because you are doing a systematic review and cannot miss anything or because what you're searching for is new or rare, you should use broader terms and fewer concepts. This will reduce the chance of missing references.

- **You can save searches**
  The way to do this will be different in each interface, so check the search help/tips or our corresponding guide, but typically you will need to create and login with a personal account for that site, as well as your OpenAthens account.

- **You can also 'export' (i.e. save) your results**
  If you want to keep a copy of your results in a separate file, you can export/save them. Again, the exact details on how to do this will depend upon the database, so

check the instructions in the search help for that interface or look at the corresponding guide on our website: www.uhl-library.nhs.uk/training

Contact the libraries
If you have any questions on anything contained in this guide, specific queries on the individual databases, or anything else on searching for information or using our resources, please don't hesitate to get it touch with one of the libraries.

LRI Library	Odames Library, Level 1, Victoria Building Email: lri.library@uhl-tr.nhs.uk Phone: 0116 258 5558

Glenfield Library	Ground floor, Education Centre Email: ggh.library@uhl-tr.nhs.uk Phone: 0116 256 3672

LGH Library	First floor, Education Centre Email: leicslib@uhl-tr.nhs.uk Phone: 0116 258 8124

Training courses, guides and e-learning can also be found on our website, which is available from home, work or on mobile: www.uhl-library.nhs.uk/training

Has this guide been helpful?
We'd love to hear whether this guide has helped you or how it could be improved.

Has it increased your confidence in searching?
Has it improved your understanding of something?
Have you used it to support your patient care or research?

Please let us know simply by contacting one of the libraries.

Appendix 1 - Alternative ways to break down a question into concepts.

SPICE	For social science or qualitative research questions	
Setting:	Where? What context?	e.g. hospital, community, GP surgery
Perspective:	Who?	e.g. hospital nurses, physiotherapists, managers
Intervention:	What?	e.g. education programme, support group
Comparison:	What else?	e.g. same people before intervention, different intervention
Evaluation:	Results? How effective?	e.g. change in attitude or understanding

SPIDER	For qualitative research questions	
Sample:	Who is being looked at?	e.g. young, mothers, Asian people, less able
Phenomenon of Interest:	Reasons for behaviour or decisions.	e.g. pregnancy, education, social group
Design:	What data collection method(s)?	e.g. questionnaire, survey, focus group
Evaluation:	What is the being evaluated?	e.g. views, experience, attitudes, feelings
Research type:	What research type is being used?	e.g. Qualitative, quantitative or mixed methods research.

ECLIPSE	For health management searches	
Expectation:	What do you want the information for?	e.g. better model of care, service improvement
Client group:	Who is the service aimed at?	e.g. older people, a particular ethnicity, single men
Location:	Where is the service set?	e.g. primary care, whole NHS, social care
Impact:	What change in service? What is success? How measured?	e.g. better communication, lower costs, more satisfaction
Professionals:	Who is involved?	e.g. doctors, social workers, opticians
Service:	What kind of service?	e.g. outpatients, nurse-led clinics, critical care

You can search the internet for 'PICO alternatives' to find further explanations of these tools or other ones that can be used.