Planning your search

It is important to plan a search strategy before beginning your research. This will help you decide what you want to find and will save you time in the future.

Define your search

Start by writing down your topic as a question or statement, for example:

Does handwashing among healthcare workers reduce rates of hospital acquired infection?

Task 1: Write down your topic of research in the box below:

Identify Keywords

To search CINAHL effectively you will need to search for just the key concepts in your question using specific keywords and short phrases.

Split your phrase or question (above) into the key concepts e.g. **handwashing, healthcare workers, hospital infection** and write each into the top row of a table.

For the best results you need to identify as many synonyms (words with similar meanings) as you can for each of your key concepts.

Below each keyword, make a list of alternative keywords or phrases that describe that concept. Remember to include alternative spellings and spell out abbreviations.

Here's an example:

Handwashing	Healthcare workers	Hospital infection
Hand washing	Health care workers	Inpatient infection
Handwash	Nurses	In-patient infection
Hand wash		
Hand hygiene		

Task 2: List key concepts and synonyms for your question in the table below:

Concept 1	Concept 2	Concept 3

Tips for finding keywords

If you are struggling to think of synonyms you can:

- use a textbook to get an overview of your subject
- use a medical dictionary or encyclopaedia for a definition of your key concept
- check the University of Suffolk Health Thesaurus
- check references you already have - what terms have they used to describe your topic?
- describe your topic aloud to someone else – it can help you think of synonyms

Finding the most effective keywords for your search usually requires some trial and error, but you can do 'scoping' searches to see which keywords are the best at returning relevant results. Continue to add to your list of keywords as you find out more about your topic.

Advanced Searching using PICO

For more advanced searching it is necessary to conduct and plan a more systematic search strategy. This will include clearly defined criteria covering what is included and excluded in the search, for example, the keywords or subject terms you will use and any limitations by language, date range or geographical area.

For Evidence Based Practice (EBP) searches, you will often be expected to break down your question into its key concepts using an EBP formula such as PICO or PIO:

PICO: **P**opulation; **I**ntervention; **C**omparison; **O**utcome
PIO: **P**opulation; **I**ntervention; **O**utcome (can use **E**xposure instead of Intervention)

P = Patient, Population, Problem
The problem or condition of interest, including any important patient characteristics that might influence treatment or the disease progression such as gender, age, race, ethnicity, coexisting conditions or setting.

I = Intervention
A drug name, a specific treatment, procedure or rehabilitation type, use of a diagnostic or screening test or an exposure to something.

C = Comparison
An alternative being considered, often a different intervention such as a placebo, standard therapy, gold standard or even no treatment. It may not be necessary to include it in the search if, for example, you are comparing an intervention with no treatment or a placebo. When there is no comparison element, as in many qualitative research questions, the search strategy can be defined as following a PIO model.

O = Outcome
The clearly defined, desired improvement, measurement or accomplishment that results from the selected treatment or intervention, such as reduced mortality, morbidity or length of stay, or an improvement in quality of life or wellbeing.

You can use PIO to turn your topic into a question:

Does [intervention] improve/reduce/prevent [outcome] in/for [population]?

You can use a table with columns for each element of the PIO, which you can complete with your relevant keywords. For the example identified above, the PIO table might look like this:

Population	Intervention	Outcome
Healthcare workers	Handwashing	Hospital infection
Health care workers	Hand washing	Inpatient infection
Nurses	Hand wash	In-patient infection
	Handwash	
	Hand hygiene	

You can use PICO to turn your topic into a question:

In patients with [problem], is [intervention] more effective than [comparison] at improving/reducing/preventing [outcome]?

You can use a table with columns for each element of the PICO, which you can complete with your relevant keywords. For this example:

Is cognitive behaviour therapy more effective at reducing the symptoms of eating disorders than antidepressants?

the PICO table might look like this:

Population	Intervention	Comparison	Outcome
Eating Disorder	Cognitive Behaviour Therapy	Antidepressants	Reduction of Symptoms
Appetite Disorder	CBT	Antidepressive Agents	Symptom Management
Anorexia Nervosa	Cognitive Therapy	Selective Serotonin Reuptake Inhibitor	Treatment Outcome
Bulimia	Cognitive Psychotherapies	SSRI	
Binge Eating Disorder	Cognitive Behavioural Therapy	Specific Drug Names (brand and generic), e.g. Fluoxetine and Prozac	

For a systematic search strategy, it's important to think of as wider range of keywords as you can so that your results will be as comprehensive as possible. The number you use will vary according to the topic you are researching. If you are struggling to think of synonyms, try the suggestions in the **Tips for finding keywords** section of this document.

Task 3: List key concepts and synonyms for your PIO/PICO question in the table below. Be sure to add all the alternatives or synonyms you can think of underneath each heading.

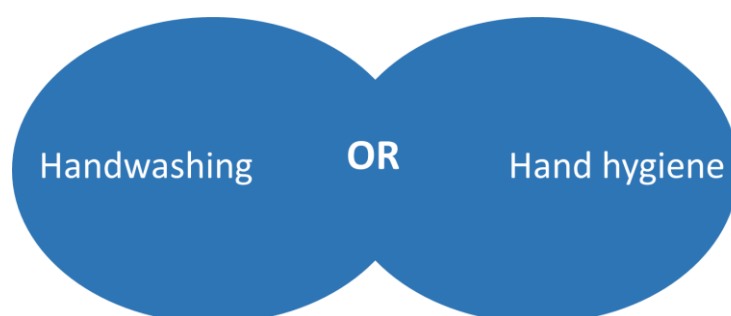| Population	Intervention	Comparison (if applicable)	Outcome

Search Techniques

In order to perform a search effectively you will need to make use of various search techniques such as **Boolean Operators**, **Truncation** and **Phrase Searching**.

Combining your keywords with Boolean Operators

When you search for information, it's very easy to get too many results or results that aren't very relevant. You need to know how to combine search terms to get the best results.
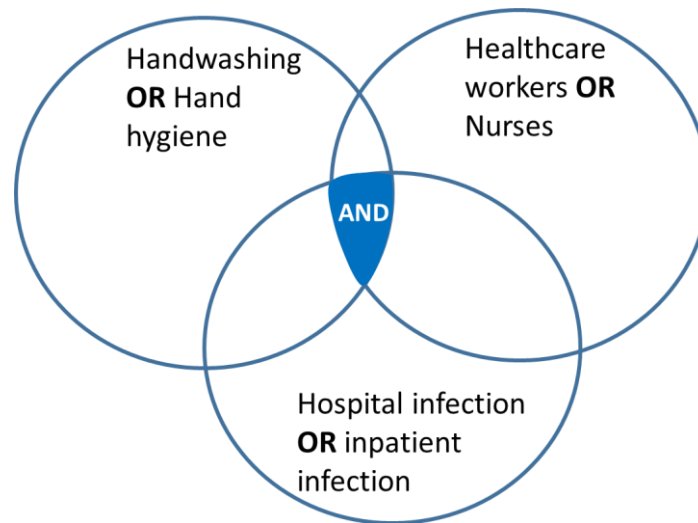
When you type in more than one search term, you can link them with **OR** or **AND.** These are known as Boolean operators.

Combining with 'OR'

As you can see, if you link your search terms with **OR**, you will retrieve everything that mentions either term.

Combining with 'AND'

If you link your terms with **AND**, you will only retrieve items that mention all the terms.

Above, there are three separate searches where the main keywords have been combined with synonyms using OR. Those separate searches have then been connected together with AND in order to get results which are more relevant or specific to the research question.

Although you get less results when you use AND, each individual results will mention at least one keyword from each of the PIO groups of keywords.

To help you use Boolean operators effectively, you could write them on your PICO/PIO table:

Population		Intervention		Outcome
Healthcare workers		Handwashing		Hospital infection
OR		**OR**		**OR**
Health care workers		Hand washing		Inpatient infection
OR		**OR**		**OR**
Nurses		Hand wash		In-patient infection
		OR		
		Handwash		
		OR		
		Hand hygiene		
Total results for P	**AND**	Total results for I	**AND**	Total results for O

Singular v plural, Truncation, Phrases and Hyphenated Words

Singular v plural

When you search using a singular form of a word, the plural and possessive forms are also retrieved. A search for **nurse**, for example, finds **nurse**, **nurses**, **nurse's** or **nurses'**.

<u>Warning</u> – this doesn't apply when the plural form is spelled differently, so **child**, for example does not also find **children**.

Truncation

Truncation is also known as "stemming". You can use it to search for a term and variant spellings of that term, by substituting the letters at the end of the word for an asterisk (*****). Your search then finds every word that begins with the letters you have entered. For example, **handwash*** will retrieve **handwash**, **handwashing**.

Phrase searching

Use quotation marks when you want to find an exact phrase. **"healthcare workers"** for example, will find only documents where those words appear next to each other and in the same order.

Hyphenated words

If you enter hyphenated words in a search, you will automatically find results for both the hyphenated and non-hyphenated forms. A search for **hand-wash**, for example, also finds **"hand wash"**.

<u>Warning</u> – if the same term also occurs as a single word you will need to search for that version separately. A search for **hand-wash OR handwash**, for example, would find **hand-wash**, **"hand wash"** or **handwash**.

If you have found this information useful and want to know more about how to use these search techniques in CINAHL, please see the **Searching CINAHL** page.