Step 3 – Acquire

To find the evidence, writers are encouraged to follow a hierarchical literature retrieval to answer questions.

1. Search for pre-filtered information, such as a systematic review of the literature or a guideline that used a rigorously conducted systematic review that matches the PICO. (The AGREE II tool can be used to assess the quality of the guideline.) Systematic reviews and guidelines can be found in PubMed using 'clinical queries' and in Trip database.
2. If more than one systematic review is identified, pick the most recent highest quality review or the one that most closely represents the PICO. A meta-analysis is preferred over a narrative summary of results. (Health Evidence Quality Assessment Tool – Review Articles or AMSTAR 2 can be used to evaluate the quality of a systematic review.)
3. If no high quality secondary research is identified, a recent narrative review can be used to summarize primary research. Such a review should include a search strategy and be balanced and objective.
4. When systematic reviews are not available or not current, PubMed can be searched for individual randomized controlled trials (RCTs); when RCTs are not available or not current, search for non-randomized studies (NRS).
5. Finally, country-specific guidelines (from Australia, Canada and the UK) may need to be considered if they provide recommendations related to the question. These can be found by searching the grey literature using the Trip database and specific and relevant organizational databases such as National Health and Medical Research Council (NHMRC), National Institute for Health and Care Excellence (NICE), and nutrition specific organizations such as Food Standards, Health Canada etc.

Databases

PubMed is a freely available database that provides access to MEDLINE, life science journals and online books. Citations include abstracts and may link to free full-text content from PubMed Central and open access publishers' websites.

If you have access, we would highly recommend using the Trip Premium database. The Trip database is a large search engine that searches multiple databases, including guidelines from many international associations; synopses from many reputable services; health technology assessments and systematic reviews from NICE, Canadian Agency for Drugs and Technologies in Health (CADTH) and The Cochrane Library; electronic textbooks; and, individual studies from PubMed. All search results are organized according the hierarchy of evidence. Searching this database can provide a 'one-stop-shopping site'.

When searching for evidence, document your search strategy including:

- Search terms (e.g. MeSH terms and text words)
- Databases searched
- Date search completed
- Search limits (including date range, English language*)
- Reasons for excluding reviews or studies using a hierarchical literature search
- See section on Documenting Your Search Strategy.

Grey Literature

Grey literature refers to non-peer reviewed but still credible sources of information such as publications issued by government, academia, business, and industry, in both print and electronic formats, but not controlled by commercial publishing interests, and where publishing is not the primary business activity of the organization. Authors are encouraged to limit themselves to government, research and credible non-government organization (NGO) websites (such as professional associations, universities, health organizations etc.) to locate pertinent grey literature.
For further info see: "Grey-Matters: A Practical Search Tool for Evidence-Based Medicine", Aug 2018 available from: https://www.cadth.ca/grey-matters
(focus on Health Technology Assessment Agencies and Clinical Practice Guidelines from partner countries)

NB – we generally recommend a focus on human studies, English language*, and current information. An older item may be considered if it sets the foundation for future

research (e.g., a Surgeon General's report) or if no newer information on the issue is available. *If author/contributor is bilingual, we encourage utilizing materials published in other languages, however, funding for translation is extremely limited. Contact your PEN mentor if you are not able to access the full text of potential articles to review.

Recommendation: review the PEN Author Training module:
Searching PubMed Module
https://www.pennutrition.com/resources/PEN%20Writers%20Page/PENPubMedModule(Dec2018).pdf

Conducting Your Search Strategy

Using the PEN Search Strategy Worksheet:

a. Define your topic (1 or 2 sentences in the form of a well-built question – remember PICO). The research question can evolve with the search but the main concepts related to population and intervention will likely apply.

b. Identify main concepts (come up with 2 to 4 keywords that define your topic, the keywords should all be separate terms that represent your main ideas). Focus key concepts on Population and Intervention from your PICO question.

c. Find other search terms – come up with synonyms for main concepts (note that it is not advisable to restrict to a MeSH search as this does not identify recent, non-indexed articles)
   - Use the MeSH database to find MeSH terms and text words https://www.ncbi.nlm.nih.gov/mesh
   - Find MeSH terms in related articles

d. Combine your terms using AND and OR

e. Incorporate options for searching
   - MeSH headings e.g. [mh]
   - Field searching title and abstract only e.g. [tiab]
   - Truncation to expand term e.g. nutr*

f. Search for systematic reviews
   - PubMed clinical queries https://www.ncbi.nlm.nih.gov/pubmed/clinical

g. PubMed Advanced search builder can be used to help build the search strategy: https://www.ncbi.nlm.nih.gov/pubmed/advanced

h. Identify exclusion criteria or limits (e.g. publication dates, English language)

i. Document reasons for excluding reviews or other studies identified using a hierarchical literature search (e.g. if two systematic reviews were identified that were published in the same year, what was the reason for excluding one of the systematic reviews).

j. List other methods used to find information and record strategies used (e.g. reviewing references lists from key articles, searching the web for grey literature, other sources)

Using the following form, authors of questions are asked to document, for each question if applicable, their search strategy in the WORD document they are producing.

This document is linked to in the:

PEN Authors and Reviewers Guide

PEN Student Assignment Guide

Documenting Your Search Strategy

Content
Practice Question

Search Terms
MeSH Terms

Text Words

Databases and Grey Literature Sources (e.g. international guidelines) Searched

Reasons for excluding reviews or studies identified using a hierarchical literature search

Date Search Completed:
Date

Search Limits (e.g. date, language):

PubMed Search Strategy Examples

Example 1

PEN Question: Should diets lower in glycemic index (GI) or glycemic load (GL) be recommended for the primary prevention of cardiovascular disease (CVD) or the secondary prevention of CVD (i.e. individuals with a history of CVD or with multiple CVD risk factors e.g. metabolic syndrome)?

SEARCH TERMS

MeSH Terms

Cardiovascular diseases
Primary prevention
Secondary prevention
Metabolic syndrome
Glycemic index
Glycemic load
Dietary carbohydrates

Text Words

Cardiovascular disease
Glycemic
Glyaecemic

PubMed Search – illustrative example only

This is an illustrative example showing how options can be incorporated into search terms – note how a combination of MeSH headings [mh] and key words [tiab] are included for each concept.

Set #1: Cardiovascular disease
(cardiovascular diseases[mh] OR cardiovascular disease[tiab] OR primary prevention[mh] OR secondary prevention[mh] OR metabolic syndrome[tiab])

Set #2: Low glycemic
(glycemic index[mh] OR glycemic load[mh] OR glycemic[tiab] OR glycaemic[tiab] OR dietary carbohydrates[mh])

Set #1 AND #2 – PubMed regular search
(cardiovascular diseases[mh] OR cardiovascular disease[tiab] OR primary prevention[mh] OR secondary prevention[mh] OR metabolic syndrome[tiab]) AND (glycemic index[mh] OR glycemic load[mh] OR glycemic[tiab] OR glycaemic[tiab] OR dietary carbohydrates[mh])

Results = 12567
Limit to 5 years and English Language = 3218 results
Limit to systematic reviews only = 186 results

OR using PubMed Advanced Search, the search strategy looks like this:

((((((cardiovascular diseases[MeSH Terms]) OR cardiovascular disease[Title/Abstract]) OR primary prevention[MeSH Terms]) OR secondary prevention[MeSH Terms]) OR metabolic syndrome[Title/Abstract]))) AND ((((glycemic[Title/Abstract]) OR glycaemic[Title/Abstract])) OR ((glycemic index[MeSH Terms]) OR glycemic load[MeSH Terms]) OR dietary carbohydrates[MeSH Terms])))

Example 2

PEN Question: What is the clinical effectiveness of the ketogenic diet to promote weight loss in adults with overweight / obesity?

SEARCH TERMS

MeSH Terms

Cardiovascular diseases
Overweight
Obesity
Weight loss
Diet, ketogenic
Diet, Carbohydrate restricted
Diet, high-protein low-carbohydrate

Text Words

Low carbohydrate diet
Ketogenic
Carbohydrate restricted diet

PubMed Search – illustrative example only

Set #1: Adults with overweight / obesity
(Cardiovascular diseases[mh] OR cardiovascular*[tiab] OR overweight[mh] OR obesity[mh] or weight*[tiab])

Set #2: Ketogenic diet
(Diet, ketogenic[mh] OR Diet, Carbohydrate-restricted[mh] OR Diet, High-Protein Low-Carbohydrate[mh] OR ketogenic*[tiab] OR low-carb*[tiab])

Set #1 AND #2
(Cardiovascular diseases[mh] OR cardiovascular*[tiab] OR overweight[mh] OR obesity[mh] or weight*[tiab]) AND (Diet, ketogenic[mh] OR Diet, Carbohydrate-restricted[mh] OR Diet, High-Protein Low-Carbohydrate[mh] OR ketogenic*[tiab] OR low-carb*[tiab])

Results = 2140
Limit to systematic reviews = 61