

PEN[®] - A Tool to Power Your Practice!



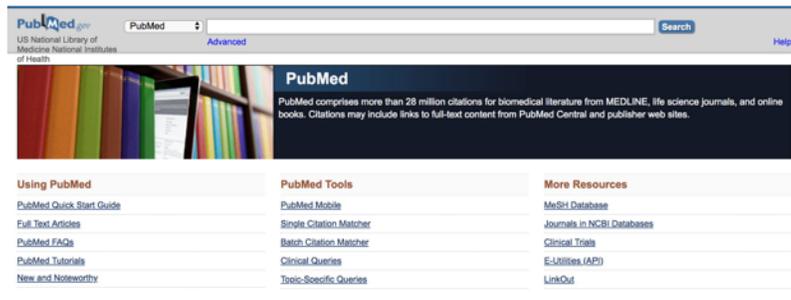
Practice-based Evidence in Nutrition (PEN[®], www.pennutrition.com) is the global resource for nutrition practice.



PEN[®] Key Feature

Using PubMed to Acquire Evidence

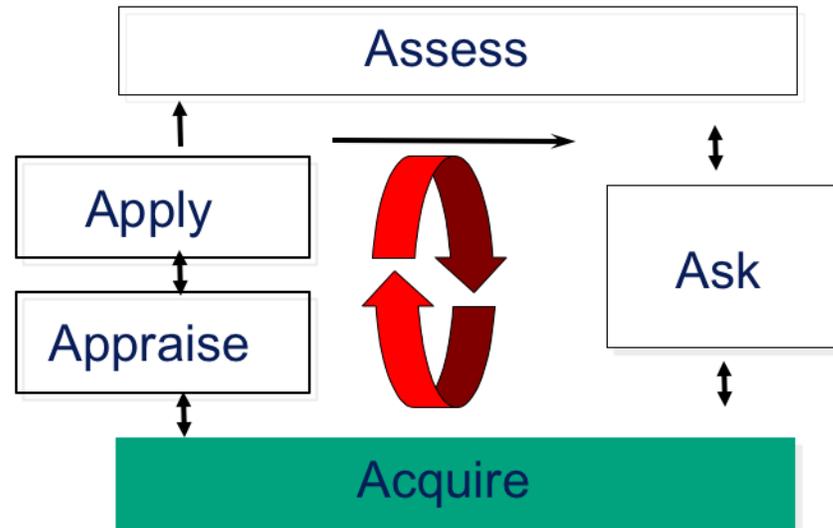
<https://www.ncbi.nlm.nih.gov/pubmed>



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
<https://www.ncbi.nlm.nih.gov/pubmed>

EBP Information Cycle

CHE Evidence-based tutorial; 2008



The goal in searching is ideally to find quality answers to your structured questions in a timely manner.

A number of sources are available that provide different types and levels or quality of evidence.

We are looking for **the BEST evidence**, not every shred of evidence on a particular topic

Hierarchical literature retrieval

Identifying best available evidence

- A. Secondary sources
 - i. Systematic review or guidelines based on systematic review
 - most recent and highest quality, most closely represents PICO
 - meta-analyses
 - ii. Narrative review with a search strategy
- B. Primary sources
 - High quality primary study more recent than the review

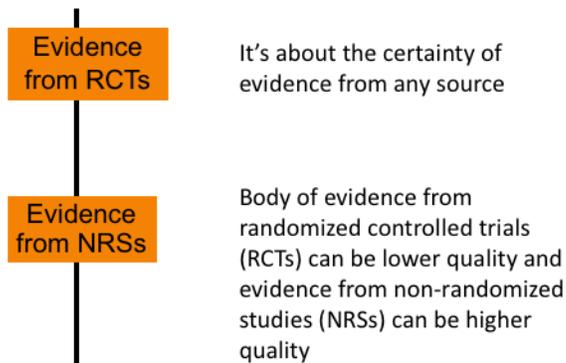


To search efficiently and find the best available evidence, the first search should be for good pre-appraised or pre-filtered secondary sources that summarize the literature and give you a useful actionable plan based on the evidence. With these sources, the work of finding and critically appraising the literature has been done for you. Pre-filtered means that an individual or group of individuals with expertise in a particular area have reviewed and presented the information that **was collected, appraised, and combined in the methodologically strongest way.**

The Hierarchical literature approach:

- A. Secondary sources include: i). high quality systematic review (SR) or guidelines based on SR. (The quality of a systematic review can be assessed as using AMSTAR 2 tool: <https://amstar.ca/Amstar-2.php>). If more than 1 SR is identified, pick only one if it addresses all important outcomes. Consider: most recent and highest quality or SR that most closely represents PICO. Meta-analyses are preferred over narrative summary of results.
- ii). if no high quality secondary research, a recent narrative review can be used to summarize primary research. Such a review should include a search strategy and be balanced and objective.
- B. Include high quality / impactful primary study(s) only if: it is more recent than the SR, it reports an important outcome not included in the SR or no review with a search strategy is available

Evidence Quality



Note that evidence can come from any source – randomized controlled trials (RCTs) and non-randomized studies (NRS).

A meta-analysis of high quality RCTs is not equivalent to a meta-analysis of observational studies / NRS. On the other hand, not all RCTs are high quality, so although we use a hierarchical approach to identify the best available evidence, we do need to look at the quality of the included studies – this is covered in the ‘appraise’ section of the information cycle.



How to become a literature search “ACE”

PubMed Tutorial

Home > Learning Resources > PubMed Online Training

Building the Search

In this module, you will learn how to use PubMed to conduct a search. By the end of this module, you should be able to:

- Understand how PubMed translates basic searches.
- Use Filters to narrow your search.
- Understand and use Boolean operators.
- Use PubMed search tools and related databases to construct a search.
- Build your own search using search field tags.

Throughout this module, you will have an opportunity to test your understanding of what has been presented.

◆ Take the PubMed Tutorial
◆ Practice

How to become a literature search ace?

Take the PubMed tutorials (they are very good). They can be accessed at:

<https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/>

Practice – you’ll get better and develop strategies that work for you.

1. Identify Search Terms

Understand the Research Question

- Determine PICO



e.g. In healthy adults and those at high risk, should lower glycemic index diets be recommended for primary or secondary prevention of cardiovascular disease?



PICO = Population, Intervention, Comparison, Outcome

The research question can evolve with the search but the main concepts related to population and intervention will likely apply.

In the example question in italics,

Population for prevention and treatment of cardiovascular disease (CVD) could be: healthy adults, adults with risk factors for CVD and those with a history of CVD

Intervention relates to low glycemic index diets

Comparison and specific Outcomes do not always need to be included in the question

PICO Concept

Population	Cardiovascular disease Primary prevention Secondary prevention
Intervention	Carbohydrates Low glycemic index Low glycemic load



Focus key concepts on population and intervention.

Finding other search terms



Subject Headings

Medical Subject Headings (MeSH) database

Use to find relevant MeSH headings



PubMed

PubMed comprises more than 21 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.

Using PubMed

[PubMed Quick Start Guide](#)

[Full Text Articles](#)

PubMed Tools

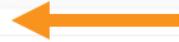
[PubMed Mobile](#)

[Single Citation Matcher](#)

More Resources

[MeSH Database](#)

[Journals in NCBI Databases](#)



MeSH = Medical Subject Headings

MeSH can be used to find other search terms (synonyms) for your main concepts. MeSH terms are assigned by PubMed indexers who select from a list of predefined subject headings. Using MeSH searches alone will not identify recent articles that have not yet been indexed (e.g. Epub), so this should not be the only search, but can be combined with other searches.



Finding other search terms

Subject Headings

- Go to MeSH database
<https://www.ncbi.nlm.nih.gov/pubmed>
- Enter concepts to find the MeSH headings [mh] AND terms that are likely important but do not have MeSH terms. These are called text words.
- List the MeSH terms and text words on your search strategy

To find relevant subject headings and other terms, go to:
MeSH database <https://www.ncbi.nlm.nih.gov/pubmed>
These MeSH headings [mh] will be used in your search.

E.g. MeSH terms for carbohydrates

The screenshot shows the MeSH database search interface. The search term 'carbohydrate' is entered in the search box. The search results are displayed on page 1 of 4. The results list several MeSH terms, with 'Dietary Carbohydrates' highlighted as a better descriptor than 'Carbohydrates'.

MeSH search results for 'carbohydrate':

- Carbohydrates**
1. A class of organic compounds composed of carbon, hydrogen, and oxygen in a ratio of C_n(H₂O)_n. The largest class of organic compounds, including STARCH; GLYCOGEN; CELLULOSE; POLYSACCHARIDES; and simple MONOSACCHARIDES.
Year introduced: metabolism was **CARBOHYDRATE METABOLISM** 1963-1965
- Carbohydrate Biochemistry**
2. The study of the structure, biosynthesis, and function of **CARBOHYDRATES** and GLYCOSYLATION.
Year introduced: 2009
- Diet, Carbohydrate-Restricted**
3. A diet that contains limited amounts of **CARBOHYDRATES**.
Year introduced: 2006
- Dietary Carbohydrates**
19. **Carbohydrates** present in food comprising digestible sugars and starches and indigestible cellulose and other dietary fibers. The former are the major source of energy. The sugars are in beet and cane sugar, fruits, honey, sweet corn, corn syrup, milk and milk products, etc.; the starches are in cereal grains, legumes (FABACEAE), tubers, etc. (From Claudio and Laguna, Nutrition and Diet Therapy Dictionary, 3d ed, p32, p277)
Year introduced: 1964
- Carbohydrate Metabolism**
4. Cellular processes in biosynthesis of **CARBOHYDRATES**.
Year introduced: 2006
- Antigens, Tumor-Associated, 20**
5. **Carbohydrate** antigens expressed on the surface of tumor cells.
Year introduced: 1989
- Glucose-Galactose Malabsorption [Supplementary Concept]**
mutation in SLC5A1
Date introduced: November 5, 2012

In the MeSH database enter the concept and the search results display a number of MeSH terms

For carbohydrate, Carbohydrates shows up as a MeSH term, but Dietary Carbohydrates is a better descriptor

MeSH categories - Dietary carbohydrates

Dietary Carbohydrates

Carbohydrates present in food comprising digestible sugars and starches and indigestible cellulose and other dietary fibers. The former are the major source of energy. The sugars are in beet and cane sugar, fruits, honey, sweet corn, corn syrup, milk and milk products, etc.; the starches are in cereal grains, legumes (FABACEAE), tubers, etc. (From Claudio and Laguna, Nutrition and Diet Therapy Dictionary, 3d ed, p277)

Year introduced: 1984

PubMed search builder options

Subheadings:

- | | | |
|---|--|--|
| <input type="checkbox"/> administration and dosage | <input type="checkbox"/> efficacy | <input type="checkbox"/> pharmacology |
| <input type="checkbox"/> adverse effects | <input type="checkbox"/> drug effects | <input type="checkbox"/> physiology |
| <input type="checkbox"/> agonists | <input type="checkbox"/> economics | <input type="checkbox"/> poisoning |
| <input type="checkbox"/> analogs and derivatives | <input type="checkbox"/> etiology | <input type="checkbox"/> radiation effects |
| <input type="checkbox"/> analysis | <input type="checkbox"/> genetics | <input type="checkbox"/> secretion |
| <input type="checkbox"/> anatomy and histology | <input type="checkbox"/> history | <input type="checkbox"/> standards |
| <input type="checkbox"/> antagonists and inhibitors | <input type="checkbox"/> immunology | <input type="checkbox"/> statistics and numerical data |
| <input type="checkbox"/> biosynthesis | <input type="checkbox"/> isolation and purification | <input type="checkbox"/> supply and distribution |
| <input type="checkbox"/> blood | <input type="checkbox"/> metabolism | <input type="checkbox"/> therapeutic use |
| <input type="checkbox"/> cerebrospinal fluid | <input type="checkbox"/> microbiology | <input type="checkbox"/> toxicity |
| <input type="checkbox"/> chemical synthesis | <input type="checkbox"/> organization and administration | <input type="checkbox"/> ultrastructure |
| <input type="checkbox"/> chemistry | <input type="checkbox"/> parasitology | <input type="checkbox"/> urine |
| <input type="checkbox"/> classification | <input type="checkbox"/> pharmacokinetics | <input type="checkbox"/> utilization |
| <input type="checkbox"/> cytology | | |

Restrict to MeSH Major Topic.

Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): D09.301, G07.203.300.362, J02.500.362

MeSH Unique ID: D004040

Entry Terms:

- + Carbohydrates, Dietary
- + Carbohydrates, Dietary
- + Dietary Carbohydrate

See Also:

- + Diet, Carbohydrate Loading

All MeSH Categories

Chemicals and Drugs Category

Carbohydrates

Dietary Carbohydrates

Dietary Fiber

Probiotics

Dietary Sugars

Dietary Sucrose

High Fructose Corn Syrup

Starch



Clicking on the MeSH term will display Subheadings and All MeSH categories
 It is best NOT to limit search by MeSH subheadings as this is reliant on indexers specifying each relevant subheading.
 MeSH Categories shows the tree structure – in this case Dietary Carbohydrates includes other terms such as Dietary Fiber, Dietary Sugars, Starch.....



Finding other search terms

Finding MeSH terms in related articles

- Use “Similar articles” or “Cited by...” to find groups of related articles.
- Click on the “Publication Types, MeSH Terms” link at the bottom of each article citation.
- Identify additional MeSH terms and text words focusing on Population and Intervention to add to your search strategy

Subject headings used for one article on the topic will likely be used for other articles on the topic.



E.g. MeSH terms in related articles

NCBI Resources How To

PubMed
US National Library of Medicine
National Institutes of Health

PubMed Advanced

Format: Abstract

Cochrane Database Syst Rev. 2017 Jul 31;7:CD004467. doi: 10.1002/14651858.CD004467.pub3.

Low glycaemic index diets for the prevention of cardiovascular disease.

Clar C¹, Al-Khudairy L, Loveman E, Kelly SA, Hartley L, Flowers N, Germanò B, Frost G, Rees K.

Publication types, MeSH terms, Substances, Grant support

Publication types
Meta-Analysis
Research Support, Non-U.S. Gov't
Review

MeSH terms
Adult
Aged
Blood Glucose/metabolism
Blood Pressure
Cardiovascular Diseases/metabolism
Cardiovascular Diseases/prevention & control*
Dietary Carbohydrates/administration & dosage
Dietary Carbohydrates/metabolism*
Fasting/metabolism
Glycemic Index*
Humans

Substances
Blood Glucose
Dietary Carbohydrates
Lipids

Looking at the MeSH terms used in this article, identifies that Glycemic Index was a major topic of the article (indicated with an asterisk *).

Primary Prevention and Secondary Prevention were other MeSH terms to describe the Population

Substances include supplementary concept terms (i.e. text words) and MeSH terms

Expanded search terms



	MeSH Terms [mh]	Text words
P	Cardiovascular diseases Primary Prevention Secondary Prevention Metabolic Syndrome	Cardiovascular disease
I	Glycemic index Glycemic load Dietary Carbohydrates	Glycaemic Glycaemic index Glycaemic load

MeSH headings can be searched in PubMed by inserting [mh] after the search term. As a reminder, MeSH headings should not be the only search terms used as this does not identify recent, non-indexed articles.

2. Combining terms



- Boolean connectors AND and OR

Boolean Operator	Example	Retrieves
AND	Cardiovascular disease AND glycemic index	Limits search – use <i>between</i> concepts
OR	Cardiovascular disease OR Metabolic syndrome	Expands search – use <i>within</i> concepts

Any search in PubMed needs to use Boolean operators - that are capitalized 'AND' or 'OR'

Brackets should be included to group 'OR' concepts together. E.g. (cardiovascular disease OR metabolic syndrome)

3. Searching



Field Searching

Searching in particular fields for a more comprehensive search

- Title[ti]
 - Abstract[ab]
 - Title or abstract[tiab]
- e.g. glycemic index[tiab]

Searching within particular fields including article title and abstract

3. Searching

Truncation*

Retrieves articles that contain all the variants of the search term

e.g. nutr* retrieves articles that contain any words that begin with these letters

- | | |
|----------------|----------------|
| •nutraceutical | nutricare |
| •nutraflora | nutriceutic |
| •nutragenomics | nutrichemistry |
| •nutramine | nutricion |
| •nutranalysis | nutridata |
| •nutrasweet | nutridynamics |
| •nutribiotic | nutrient |
| •nutrical | nutrients..... |

The PubMed truncation symbol is the asterisk (*). It is sometimes referred to as a wildcard since it finds all terms that begin with a given string of text. Truncation broadens the search and can retrieve a lot of articles, so it should be reserved for occasions when few results are retrieved or there is limited use of a term.

3. Searching

Limiting - to retrieve fewer and more relevant articles

- Applying filters in PubMed can exclude most recent literature (except date and language filters)

Instead:

- PubMed clinical queries
<https://www.ncbi.nlm.nih.gov/pubmed/clinical>
- Strings attached: CADTH's database search filters
<https://www.cadth.ca/resources/finding-evidence/strings-attached-cadths-database-search-filters>



Applying filters in PubMed can exclude some citations that have not yet been indexed including Epub ahead of print, so this excludes the most recent literature on the topic. The exception to this is date filters language filters

An alternative is to use:

PubMed clinical queries: <https://www.ncbi.nlm.nih.gov/pubmed/clinical>

Strings attached: CADTH's database search filters:

<https://www.cadth.ca/resources/finding-evidence/strings-attached-cadths-database-search-filters>

Focused clinical search

PubMed clinical queries

The screenshot displays the PubMed website interface. At the top, there is a navigation bar with links for 'NCBI Resources', 'How To', and user options like 'dawnroyall', 'My.NCBI', and 'Sign Out'. Below this is the PubMed logo and a search bar with the text 'PubMed' and a 'Search' button. A banner image shows a bookshelf with a tablet displaying a search result. Below the banner, there is a section titled 'PubMed' with a brief description: 'PubMed comprises more than 28 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.' The main content area is divided into three columns: 'Using PubMed', 'PubMed Tools', and 'More Resources'. The 'PubMed Tools' column contains links for 'PubMed Mobile', 'Single Citation Matcher', 'Batch Citation Matcher', 'Clinical Queries', and 'Topic-Specific Queries'. An orange arrow points to the 'Clinical Queries' link. The 'More Resources' column contains links for 'MeSH Database', 'Journals in NCBI Databases', 'Clinical Trials', 'E-Utilities (API)', and 'LinkOut'.

PubMed Clinical Queries is available at:

<https://www.ncbi.nlm.nih.gov/pubmed/clinical>

Clinical queries is used to identify specific clinical research, especially systematic reviews

E.g. PubMed clinical queries

PubMed Clinical Queries

Results of searches on this page are limited to specific clinical research areas. For comprehensive searches, use [PubMed](#) directly.



cardiovascular disease AND (glycemic index OR glycemic load)

Clinical Study Categories **Systematic Reviews** **Medical Genetics**

Category: Topic:

Scope:

Results: 5 of 930
 Etiology
 Diagnosis
 Therapy
 Prognosis
 Clinical prediction guides
 Zapata-Lamana R, Henrik Valdes R, Cigarron I, Sot S, Ramirez-Campillo R, Garcia-Hermoso A, et al. Front Physiol. 2018; 9:1287. Epub 2018 Sep 18.
 Impact of short-term fructose supplementation on fasting

Results: 5 of 78
 ce of the Glycemic Index and Glycemic Load for Body Diabetes, and Cardiovascular Disease.
 xez S, Venn BJ, Slavin JL. . 2018 Sep 22; 10(10). Epub 2018 Sep 22.
 Effect of pasta in the context of low-glycaemic index dietary patterns on body weight and markers of adiposity: a systematic review and meta-analysis of randomised controlled trials in adults

Results: 5 of 80
 Investigating the Atherogenic Risk of Lipoprotein(a) in Type 2 Diabetic Patients.
 Peeela JR, Latiwesh OB, Elshaari F, Hussain A, Tabrez E, Vigilano E, Edwards A, Ali F, Rawal AK. Cureus. 2018 Jul 23; 10(7):e3030. Epub 2018 Jul 23.
 Effects of a Carob-Pod-Derived Sweetener on Glucose Metabolism.

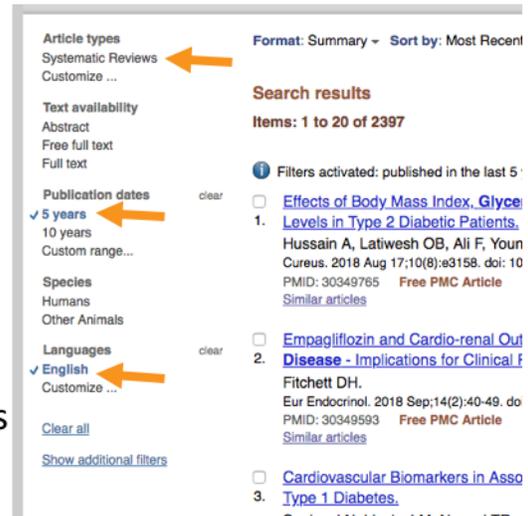
Use the search terms for the population and intervention part of the PICO question; In this example of cardiovascular disease AND (glycemic index OR glycemic load), PubMed Clinical Queries yielded 78 Systematic Reviews. This preliminary search is useful to screen for systematic reviews prior to conducting a more thorough search.

The Clinical Study Categories are: etiology, diagnosis, therapy, prognosis, clinical prediction guides. The scope can be broad or narrow to identify primary studies.

Other Limits

Exclusion criteria

- Publication dates
- English languages
- Article types
 - Systematic Reviews



Article types: Systematic Reviews (selected), Customize ...

Text availability: Abstract, Free full text, Full text

Publication dates: 5 years (selected), 10 years, Custom range... clear

Species: Humans (selected), Other Animals

Languages: English (selected), Customize ... clear

Format: Summary | Sort by: Most Recent

Search results: Items: 1 to 20 of 2397

Filters activated: published in the last 5 years

- Effects of Body Mass Index, Glycemia Levels in Type 2 Diabetic Patients. Hussain A, Latiwesh OB, Ali F, Youn Cures. 2018 Aug 17;10(8):e3158. doi: 10. PMID: 30349765 Free PMC Article Similar articles
- Empagliflozin and Cardio-renal Outcomes in Type 2 Diabetes - Implications for Clinical Practice. Fitchett DH. Eur Endocrinol. 2018 Sep;14(2):40-49. doi: 10. PMID: 30349593 Free PMC Article Similar articles
- Cardiovascular Biomarkers in Association with Type 1 Diabetes. ...

After a search has been conducted in PubMed, exclusion criteria can be applied:

- Publication date: may consider only looking for evidence since the question was last updated in PEN (or last 5 years)
- Language limits: generally consider only English language articles

These filters do not appear to exclude indexed literature so will include the most recent articles.

Another filter that can be applied at this time is Article types – for Systematic Reviews. This should result in a similar search as PubMed Clinical Queries – systematic reviews

PubMed Advanced Search

NCBI Resources How To dawnaroyal My NCBI Sign Out

PubMed.gov PubMed Search Help

PubMed Advanced Search Builder

History deleted

cardiovascular diseases[MeSH Terms] Edit Clear

Builder

MeSH Terms cardiovascular diseases Show index list

AND All Fields cardiovascular diseases Show index list

(glycemic index[Title/Abstract] OR glycemic load[Title/Abstract]) Edit

Builder

Title/Abstract glycemic index Show index list

OR Title/Abstract glycemic load Show index list

AND All Fields Show index list

Search or Add to history



Advanced search (located under the search box) can be used to build the detailed search strategy. It helps with searching by field and by combining search concepts, but it can be challenging to use this search if there are too many search terms.

For Field search, click on All Fields and choose the limits E.g.

MeSH Terms for cardiovascular diseases

Title / Abstract for glycemic index OR glycemic load

Click on **Add to history** after each entry

PubMed Advanced Search Builder



PubMed Advanced Search Builder

[(cardiovascular diseases[MeSH Terms]) AND ((glycemic index[Title/Abstract]) OR glyceimic load[Title/Abstract])]

Builder

Builder	Show index list
cardiovascular diseases[MeSH Terms]	Show index list
(glycemic index[Title/Abstract]) OR glyceimic load[Title/Abstract]	Show index list
	Show index list

History

Search	Add to builder	Query	Items found	Time
#37	Add	Search (cardiovascular diseases[MeSH Terms]) AND ((glycemic index[Title/Abstract]) OR glyceimic load[Title/Abstract])	273	13:32:21
#36	Add	Search (glycemic index[Title/Abstract]) OR glyceimic load[Title/Abstract]	2375	13:31:39
#35	Add	Search cardiovascular diseases[MeSH Terms]	2222489	13:31:18

History

Search	Add to builder	Query	Items found
#41	Add	Search (((cardiovascular diseases[MeSH Terms]) OR ((primary prevention[MeSH Terms]) OR secondary prevention[MeSH Terms])) OR (((dyslipidemias[MeSH Terms]) OR hypertension[MeSH Terms]) OR metabolic syndrome[MeSH Terms]) OR glucose intolerance[MeSH Terms])) AND ((glycemic index[Title/Abstract]) OR glyceimic load[Title/Abstract]) OR dietary carbohydrates[MeSH Terms])	5946

As you include more concepts, you can click on Add to Build the search strategy. As the Search strategy is building, the number of Items found are displayed at the bottom.

For **A**, fewer search terms found 273 items - this is not a large number, but does include all study designs rather than limiting to systematic reviews.

In contrast, for **B** over 5000 items were identified when all search terms were included – this is too large and the search would need to be narrowed.

The YouTube video link at the top of the page provides a brief tutorial: <https://www.youtube.com/watch?v=dncRQ1cobdc&feature=relmfu>

Final PubMed Search Strategy

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 glyceimic

(glycemic index[mh] OR glyceimic load[mh] OR glyceimic[tiab] OR glycaemic[tiab] OR dietary carbohydrates[mh])

Combine #1 AND #2

Results = 12474

Limit to: systematic reviews, last 5 years, English language
= 92 results

In conducting the search strategy, it is useful to:

1. Put all of the concepts related to the population together – in brackets separated with OR
2. Put all of the concepts related to intervention together – in brackets separated by OR
3. Combine the 2 concepts and add limits

4. Adapting the search



Narrowing – if the search is too large

- Focus by adding terms, limiting terms to particular fields or adding limits

Expanding – if the search is too narrow

- Remove overly restrictive terms or adding similar terms to your search

5. Documenting the search strategy

PEN Search Strategy Worksheet:

Search Strategy

Content

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
Metabolic Syndrome X
Dyslipidemias
Cholesterol/blood
Triglycerides
Cholesterol, HDL
Cholesterol, LDL
Blood glucose
Blood pressure
Adult

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

PubMed
TRIP
Recent guidelines using systematic literature search: Canadian Cardiovascular Society

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

Excluded systematic reviews as outcomes were reported in other reviews that were more relevant and/or lower risk of bias:

1. Fan J, Song Y, Wang Y, Hui R, Zhang W. Dietary glycaemic index, glycaemic load, and risk of coronary heart disease, stroke, and stroke mortality: a systematic review with meta-analysis. *PLoS One*. 2012;7(12):e52182. doi: 10.1371/journal.pone.0052182. Epub 2012 Dec 20. Abstract available from: <https://www.ncbi.nlm.nih.gov/pubmed/23284926>
2. Dong JY, Zhang YH, Wang P, Qin LQ. Meta-analysis of dietary glycaemic load and glycaemic index in relation to risk of coronary heart disease. *Am J Cardiol*. 2012 Jun 1;109(11):1608-13. doi: 10.1016/j.amjcard.2012.01.385. Epub 2012 Mar 20. Abstract available from: <https://www.ncbi.nlm.nih.gov/pubmed/22440121>
3. Cai X, Wang C, Wang S, Cao G, Jin C, Yu J, et al. Carbohydrate Intake, Glycaemic Index, Glycaemic Load, and Stroke: A Meta-analysis of Prospective Cohort Studies. *Asia Pac J Public Health*. 2015 Jul;27(5):486-96. doi: 10.1177/1010539514566742. Epub 2015 Jan 14. Abstract available from: <https://www.ncbi.nlm.nih.gov/pubmed/25593213>

Date of Search

Date Search Completed: August 20, 2017
Date Range of Search: 2012-2017



Documenting the search strategy includes:

Search terms (MeSH and text words)

Databases and Grey Literature Sources Searched

Reasons for excluding reviews or studies identified using a hierarchical literature search – for example if two systematic reviews were identified that were published in the same year, what was the reason for excluding one of the systematic reviews

Search dates / Limits

Search Strategy Resources

PEN Author and Reviewers Guide:

Step 3: Acquire evidence:

[https://www.pennutrition.com/resources/PEN%20Writers%20Page/SearchStrategyContentPEN%20Guides%20\(Dec2018\)reviewed.pdf](https://www.pennutrition.com/resources/PEN%20Writers%20Page/SearchStrategyContentPEN%20Guides%20(Dec2018)reviewed.pdf)

PEN Search Strategy Worksheet:

[http://www.pennutrition.com/resources/PEN%20Writers%20Page/Search%20Strategy_June2017_\(rev%20Dec%202018\).pdf](http://www.pennutrition.com/resources/PEN%20Writers%20Page/Search%20Strategy_June2017_(rev%20Dec%202018).pdf)



Additional Search Strategy Resources are available to download from the PEN Author and Reviewer's Guide:

Step 3: Acquire evidence

[https://www.pennutrition.com/resources/PEN%20Writers%20Page/SearchStrategyContentPEN%20Guides%20\(Dec2018\)reviewed.pdf](https://www.pennutrition.com/resources/PEN%20Writers%20Page/SearchStrategyContentPEN%20Guides%20(Dec2018)reviewed.pdf)

PEN Search Strategy Worksheet

[http://www.pennutrition.com/resources/PEN%20Writers%20Page/Search%20Strategy_June2017_\(rev%20Dec%202018\).pdf](http://www.pennutrition.com/resources/PEN%20Writers%20Page/Search%20Strategy_June2017_(rev%20Dec%202018).pdf)



Literature searching summary:

- ◆ Find the terms for the 'P' and 'I' variables from your question
- ◆ Prepare a list of your MeSH terms and text words
- ◆ Incorporate field searching (e.g. [tiab])
- ◆ Combine terms using Boolean connector "AND" (or "OR")
- ◆ Look first for: Filtered literature (systematic reviews and guidelines based on a systematic review)
- ◆ If you have not found enough in the filtered literature, begin searching primary studies with limits (e.g. date, language)
- ◆ Document your search strategy



PEN[®] Training Modules

The following PEN[®] Training Modules are also available:

- Evidence-based Process
- Asking the Question
- Appraising the Literature
- Quick Review of Study Designs

<https://www.pennutrition.com/authorsreviewersresources.aspx>

The other PEN[®] Author training modules can be accessed at:
<https://www.pennutrition.com/authorsreviewersresources.aspx>

Thank you to the Research Information Services at CADTH for reviewing and providing input into this module.



Questions? Contact Us:

<http://www.pennutrition.com/contact.aspx>

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