

# Using the PubMed Searches on the OPHS Website



## An Instructional Guide

Created by the Ontario Public Health Libraries Association

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# Introduction

Members of the Ontario Public Health Libraries Association (OPHLA) held a series of working sessions over a period of 4 months to create over 130 literature search strategies that would retrieve journal articles relevant to the content of the Ontario Public Health Standards (OPHS). Search strategies were developed to support the sections of the OPHS not explicitly governed by protocols. These search strategies have been hyperlinked to the PubMed database.

A complete list of the literature searches organized by subject is available in the **General Resources** section of the OPHS website under the heading **Literature Searches**.



The screenshot shows the Ontario Public Health Standards website. The header includes the Ontario logo and the text 'MINISTRY OF HEALTH AND LONG-TERM CARE'. Navigation links for 'HOME | SITEMAP | FRANÇAIS' and 'MOHLTC | CONTACT US' are present. The main heading is 'Ontario Public Health Standards' followed by 'General Resources'. A sidebar on the left lists various resources, with 'Literature Searches' circled in red. The main content area describes the resources and lists several links: 'Legislative Authority for the OPHS and Protocols', 'Glossary for the OPHS', 'Logic Models', 'Literature Searches', 'Critical Appraisal of Evidence and Research', 'French Language Services', 'Mental Health Promotion', 'Resilience', 'A Look at the OPHS and Protocols Across Various Dimensions', 'Comparison of the 2008 OPHS and 1997 MHPSP', and 'Public Health Links'. The 'Literature Searches' link is highlighted with a red circle, and its description is: 'A tool for conducting predetermined literature searches (through PubMed) on topic areas relevant to the requirements.'

When you click on the hyperlinked title of a search, predetermined keywords and subject headings (the “search strategy”) are automatically sent to the PubMed database and a list of search results is generated. These searches are “live” in that they are refreshed and updated every time you click on them. You may see more articles today than you did yesterday if new articles which match your search criteria have been added to the database since the last time you clicked on the search. This mechanism ensures that the body of research retrieved by the search remains up to date.

This guide will provide you with basic information about:

- PubMed;
- Limitations of the searches;
- Customizing searches to suit your needs;
- Systematic reviews; and
- Obtaining full text articles.

# PubMed Overview

PubMed is a free bibliographic database which is maintained by the US National Library of Medicine. It is accessible at the following URL:

<http://www.ncbi.nlm.nih.gov/sites/entrez?db=PubMed>.

Although PubMed is primarily a biomedical database, it also incorporates allied health and nursing components. At present there are over 15 million citations in the database.

PubMed was selected as the most appropriate database for this project for four important reasons:

1. It is freely available on the Internet, with no subscription or registration required;
2. It is one of the largest and most well-regarded biomedical databases available, indexing thousands of high-impact journals;
3. PubMed's diverse subject coverage can adequately address the multidisciplinary nature of public health; and
4. PubMed is extremely up-to-date. New citations are added to the database on a daily basis.

# What These Searches are NOT

The searches on the OPHS website are not sufficient to support comprehensive literature reviews or systematic reviews. These types of review necessitate a thorough, multi-database search to ensure the retrieval of all relevant literature written on a topic. PubMed is only one of over 150 bibliographic databases of relevance to public health. Others include CINAHL (the Cumulative Index to Nursing & Allied Health Literature), EMBASE (indexes international biomedical literature), and ERIC (the Education Resources Information Centre).

Rather than striving to be comprehensive, these searches provide a selection of current evidence to support the implementation of the requirements in the OPHS. They are suitable for keeping users up-to-date with the latest scientific developments and recently published literature.

There are several current public health initiatives which provide quality-assessed, evidence-based resources for professionals in the field. Some important public health evidence initiatives include:

- Effective Public Health Practice Project (EPHPP)  
<http://www.myhamilton.ca/myhamilton/CityandGovernment/HealthandSocialServices/Research/EPHPP/>
- health-evidence.ca  
<http://www.health-evidence.ca>
- National Collaborating Centres for Public Health.  
[http://www.phac-aspc.gc.ca/php-psp/ncc\\_e.html](http://www.phac-aspc.gc.ca/php-psp/ncc_e.html)

Governments, agencies, community organizations, and other institutions also produce a wealth of useful information which may not be formally published or indexed in traditional databases. These publications are collectively referred to as “grey literature”. To access this type of information, use search engines and browse online subject directories. To locate grey literature resources which are relevant to public health, see OPHLA’s research tool entitled [Public Health Grey Literature Sources](#). Public health librarians can offer additional expertise conducting more in-depth reviews of research literature on public health topics.

# Irrelevant Search Results

Searching for research literature on any topic is as much an art as it is a science. This is evident in the live searches on the OPHS website. Many key public health concepts from the OPHS are not yet captured by the controlled vocabulary called MeSH (Medical Subject Headings) which is used to index the journal literature in PubMed. The absence of appropriate subject terms to refine a search necessitates use of the less precise technique of searching for key words in the titles and abstracts of articles. This type of searching can produce some false hits and erroneous results. Depending on the topic of the search, some result lists will contain a higher percentage of relevant articles than others. This is normal.

A lower percentage of relevant articles may also be indicative of a lack of published research on that particular public health issue. Also, the algorithm behind the database's search function ranks the articles by relevancy according to predetermined criteria, and users do not have the option of changing these defaults.

## Tip!



Careful review of the entire search set will reveal useful citations and abstracts. At the very least, the first 50 citations should be considered.

Typically, when you receive a literature search from your library, the librarian has weeded the irrelevant articles before delivering the results to you. In the case of these “live” searches, this weeding is not possible. However, the live searches may be customized to suit individual information needs with a minimal amount of tweaking (i.e. a simple substitution of keywords can narrow, broaden, or re-focus a search, e.g. retrieving information on the prevention of a particular chronic disease rather than general information on chronic disease prevention). For ways to customize your search, see the **Modifying Searches** section on page 12 of this guide.

# How to Access a Search

1. Click on the **Literature Searches** heading in the **General Resources** section of the OPHS website. Click on the hyperlinked title of any search statement about which you would like to find research evidence. This will automatically run a search in PubMed on your topic.
2. A list of results will open in a new window. Mark articles of interest by clicking on the **checkbox** beside each citation (A). To view the next page of article citations, click on the **Next** link in the top right hand corner of the results screen (B). The default number of results displayed on each page will be 50. You can adjust the number of results displayed on each page using the **Show:** drop down box (C).

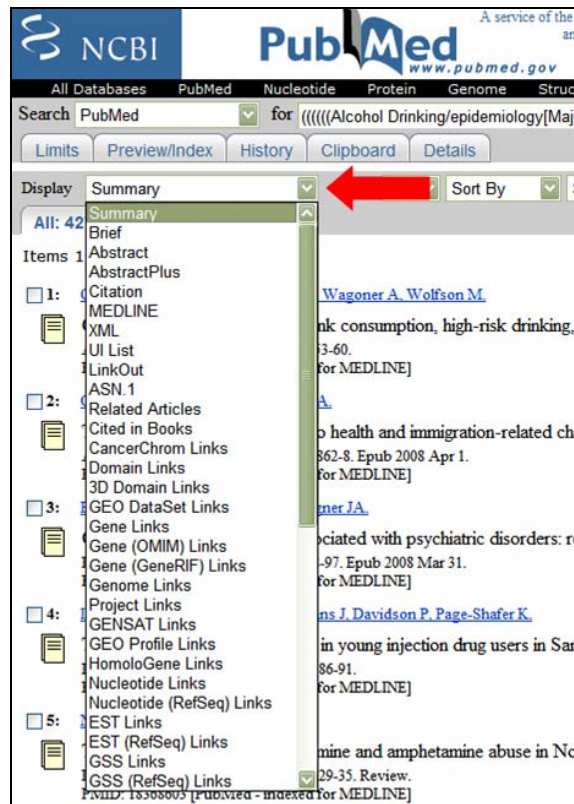
The screenshot shows the PubMed search results page. At the top, there is a navigation bar with 'NCBI' and 'PubMed' logos, and a search bar containing the query '((((Alcohol Drinking/epidemiology[Majr] OR Alcohol) Go Clear Advanced Search (beta) Save Search'. Below the search bar, there are tabs for 'Limits', 'Preview/Index', 'History', 'Clipboard', and 'Details'. The 'Display' section shows 'Summary' and a 'Show' dropdown menu set to '50', which is circled in red and labeled 'C'. To the right of the 'Show' dropdown is a 'Sort B' dropdown and a 'Send to' dropdown. In the top right corner, there is a 'Page 1 of 9 Next' indicator, with 'Next' circled in red and labeled 'B'. The search results are listed below, with the first three items shown. The first item is checked, and the checkbox is circled in red and labeled 'A'. The second item is not checked. The third item is checked, and the checkbox is circled in red and labeled 'A'. The search results include the following information for each item:

- Item 1: [O'Brien MC, McCoy TP, Rhodes SD, Wagoner A, Wolfson M.](#)  
Caffeinated cocktails: energy drink consumption, high-risk drinking, and alcohol-related consequences among college students.  
Acad Emerg Med. 2008 May;15(5):453-60.  
PMID: 18439201 [PubMed - indexed for MEDLINE]
- Item 2: [Ojeda VD, Patterson TL, Strathdee SA.](#)  
The influence of perceived risk to health and immigration-related characteristics on substance use among Latino and other immigrants.  
Am J Public Health. 2008 May;98(5):862-8. Epub 2008 Apr 1.  
PMID: 18382009 [PubMed - indexed for MEDLINE]
- Item 3: [Petry NM, Fergusson DM, Plettrak RH, Wagner JA.](#)  
Overweight and obesity are associated with psychiatric disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions.  
Psychosom Med. 2008 Apr;70(3):288-97. Epub 2008 Mar 31.  
PMID: 18378873 [PubMed - indexed for MEDLINE]

# PubMed Search Tips

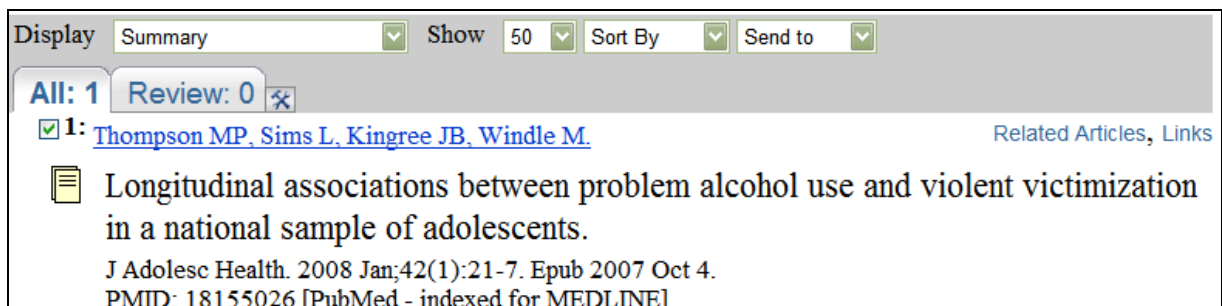
## Displaying Your Results

The **Display** drop down menu provides a number of options for displaying the citations in the result list.



The three most common display options are:

1. **Summary.** This is the default display option for citations and is ideal for viewing a large number of citations at once. The following fields are displayed in summary mode: author name(s), article title, journal name, volume, issue and page numbers, and unique identifier.




2. **Abstract.** This view displays all fields from the summary option plus the publication type, the author's affiliated institution(s), and an abstract (summary) for each article.

Display Abstract Show 50 Sort By Send to

All: 1 Review: 0

1: [J Adolesc Health](#). 2008 Jan;42(1):21-7. Epub 2007 Oct 4. [Related Articles, Links](#)

 FULL-TEXT ARTICLE

**Longitudinal associations between problem alcohol use and violent victimization in a national sample of adolescents.**

[Thompson MP](#), [Sims L](#), [Kingree JB](#), [Windle M](#).

Department of Public Health Sciences, Clemson University, Clemson, South Carolina 29634, USA. [mpthomp@clemson.edu](mailto:mpthomp@clemson.edu)

PURPOSE: Research indicates that alcohol use is both a risk factor for and a consequence of violent victimization. This study investigated the longitudinal associations between problem alcohol use and victimization, and whether these associations varied by gender. METHODS: Data from the National Longitudinal Study on Adolescent Health (Add Health) were used to investigate the prospective associations between alcohol use and victimization over three time points spanning 7 years. Because adolescence is a time of rapid growth, we used latent growth modeling (LGM) in addition to traditional cross-lagged structural equation modeling (SEM). RESULTS: For boys, both SEM and LGM indicated that problem alcohol use was a risk factor for subsequent violent victimization. For girls, the SEM suggested a bi-directional association, although the LGM provided stronger support for problem alcohol use as a risk factor for, rather than a consequence of, violent victimization. CONCLUSIONS: Findings across the two statistical approaches suggest that interventions that reduce the likelihood of problem alcohol use among adolescents can minimize the short-term risk of victimization and the long-term risk of problem alcohol use in young adulthood.


PMID: 18155026 [PubMed - indexed for MEDLINE]

3. **Citation.** This option is similar to the Abstract view, but also displays the assigned MeSH headings for each citation.

Display Citation Show 20 Sort By Send to

All: 1 Review: 0

1: [J Adolesc Health](#). 2008 Jan;42(1):21-7. Epub 2007 Oct 4. [Related Articles, Links](#)

 FULL-TEXT ARTICLE

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PURPOSE: Research indicates that alcohol use is both a risk factor for and a consequence of violent victimization. This study investigated the longitudinal associations between problem alcohol use and victimization, and whether these associations varied by gender. METHODS: Data from the National Longitudinal Study on Adolescent Health (Add Health) were used to investigate the prospective associations between alcohol use and victimization over three time points spanning 7 years. Because adolescence is a time of rapid growth, we used latent growth modeling (LGM) in addition to traditional cross-lagged structural equation modeling (SEM). RESULTS: For boys, both SEM and LGM indicated that problem alcohol use was a risk factor for subsequent violent victimization. For girls, the SEM suggested a bi-directional association, although the LGM provided stronger support for problem alcohol use as a risk factor for, rather than a consequence of, violent victimization. CONCLUSIONS: Findings across the two statistical approaches suggest that interventions that reduce the likelihood of problem alcohol use among adolescents can minimize the short-term risk of victimization and the long-term risk of problem alcohol use in young adulthood.

MeSH Terms:

- [Adolescent](#)
- [Adolescent Behavior/psychology\\*](#)
- [Alcoholism/epidemiology\\*](#)
- [Alcoholism/psychology](#)
- [Crime Victims/psychology](#)
- [Crime Victims/statistics & numerical data\\*](#)
- [Female](#)
- [Follow-Up Studies](#)
- [Health Surveys\\*](#)
- [Humans](#)
- [Longitudinal Studies](#)
- [Male](#)
- [Risk Factors](#)
- [Sex Distribution](#)
- [United States/epidemiology](#)
- [Violence/psychology](#)
- [Violence/statistics & numerical data\\*](#)

PMID: 18155026 [PubMed - indexed for MEDLINE]

## Sorting Your Results

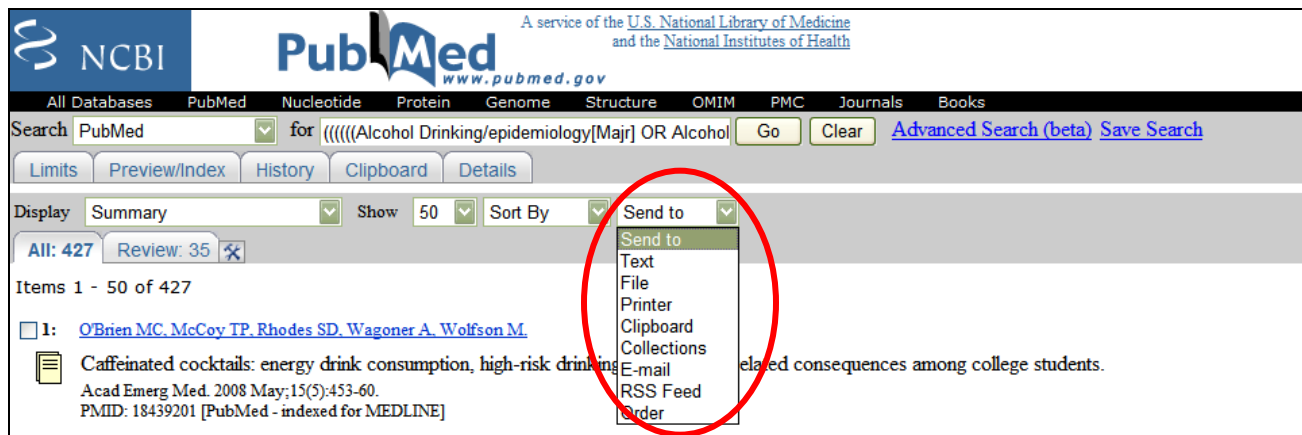
The **Sort by** drop down menu allows you to sort your search results according to different fields. You can change the order in which the search results are sorted and displayed by selecting an option from this list. You may choose to view the citations by publication date (default), last name of first author, or journal name.



The screenshot shows the PubMed search results page. The search criteria are "PubMed" for "((((Alcohol Drinking/epidemiology[Majr] OR Alcohol". The results are displayed in "Summary" view, showing 427 items. The "Sort By" dropdown menu is open, showing options: "Sort By", "Pub Date", "First Author", "Last Author", and "Journal". The first result is "Caffeinated cocktails: energy drink consumption, high-risk drinking, and alcohol-related consequences among college students." with PMID: 18439201.

## Saving, Printing and Emailing Your Results

The **Send to** drop down menu provides you with a number of options for saving, printing and emailing only those citations that you have selected as relevant. After you have reviewed all of the search results and clicked on the checkboxes next to your desired citations, select one of the options from the **Send to** menu to keep your selected results on file.




The screenshot shows the PubMed search results page. The search criteria are "PubMed" for "((((Alcohol Drinking/epidemiology[Majr] OR Alcohol". The results are displayed in "Summary" view, showing 427 items. The "Send to" dropdown menu is open, showing options: "Send to", "Text", "File", "Printer", "Clipboard", "Collections", "E-mail", "RSS Feed", and "Order". The first result is "Caffeinated cocktails: energy drink consumption, high-risk drinking and alcohol-related consequences among college students." with PMID: 18439201.

## Related Articles

The Related Articles feature can be a useful strategy for identifying additional related articles on your chosen subject, which will make for a more thorough literature search.

When you click on the blue Related Articles hyperlink in the top right-hand corner of a citation, a list of articles with MeSH headings similar to those of the original article will be displayed.

**6:** [DuRant RH, Neiberg R, Champion H, Rhodes SD, Wolfson M.](#) [Related Articles](#) [Links](#)

 **Viewing professional wrestling on television and engaging in violent and other health risk behaviors.**

South Med J. 2008 Feb;101(2):129-37.  
PMID: 18364611 [PubMed - indexed for MEDLINE]


This function is particularly useful in instances when the original list of search results contains a significant number of erroneous results.

# Modifying Searches

If you would like to find research evidence on a topic that is not directly addressed by the searches on the OPHS website, there are several ways that you can modify these existing searches to suit your needs. By using additional search limits to refine your results or substituting a few key search terms in an existing strategy, you can retrieve more relevant results without having to create an entirely new strategy.

## Applying Search Limits

**Tip!**



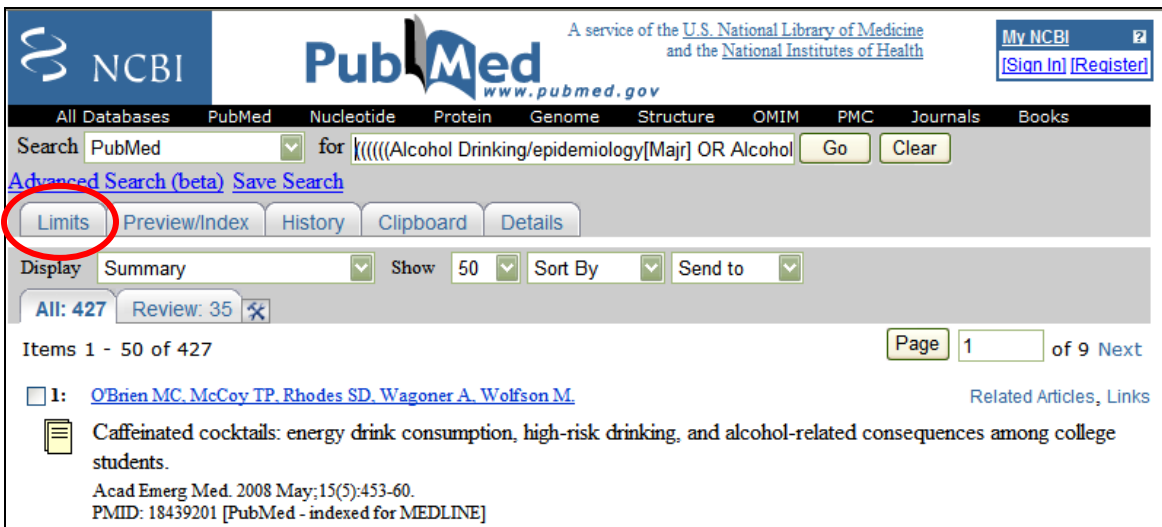
The literature searches on the OPHS website have pre-set "limits" which ensure that each search will retrieve only those articles which:

- Focus on human subjects rather than animals;
- Have been written in English or French; and
- Have been published within the last 5 years (10 years for more obscure topics).

In some instances, geographic limits have also been applied.

The **Limits** tab in PubMed offers a number of options to help you refine a search strategy. Depending on which limit you choose to apply, you can restrict your search results to a particular type of study (e.g. meta-analysis, clinical trial, etc.), a particular age group (e.g. children 6-12 years of age, the aged, etc.), a particular gender, and many other specifications.

1. Click on the Limits tab located on the grey toolbar above the search query box.



NCBI PubMed A service of the U.S. National Library of Medicine and the National Institutes of Health www.pubmed.gov My NCBI [Sign In] [Register]

All Databases PubMed Nucleotide Protein Genome Structure OMIM PMC Journals Books

Search PubMed for [((((Alcohol Drinking/epidemiology[Majr] OR Alcohol] Go Clear

Advanced Search (beta) Save Search

Limits Preview/Index History Clipboard Details

Display Summary Show 50 Sort By Send to

All: 427 Review: 35

Items 1 - 50 of 427 Page 1 of 9 Next

1: O'Brien MC, McCoy TP, Rhodes SD, Wagoner A, Wolfson M. Caffeinated cocktails: energy drink consumption, high-risk drinking, and alcohol-related consequences among college students. Acad Emerg Med. 2008 May;15(5):453-60. PMID: 18439201 [PubMed - indexed for MEDLINE]

- You will be redirected to the screen below. Click on the checkboxes beside the limits that you wish to add to your search strategy.

Limit your search by any of the following criteria.

**Search by Author** Add Author CLEAR

**Search by Journal** Add Journal CLEAR

**Full Text, Free Full Text, and Abstracts** CLEAR

Links to full text  Links to free full text  Abstracts

**Dates** CLEAR

**Published in the Last:** Any date

**Added to PubMed in the Last:** Any date

**Humans or Animals** CLEAR

Humans  Animals

**Gender** CLEAR

Male  Female

**Languages** CLEAR

English

French

German

Italian

Japanese

Russian

Spanish

**More Languages**

Afrikaans

Albanian

**Subsets** CLEAR

**Journal Groups**

Core clinical journals

Dental journals

Nursing journals

**Topics**

AIDS

Bioethics

Cancer

Complementary Medicine

History of Medicine

**Type of Article** CLEAR

Clinical Trial

Editorial

Letter

Meta-Analysis

Practice Guideline

Randomized Controlled Trial

Review

**More Publication Types**

Addresses

Bibliography

**Ages** CLEAR

All Infant: birth-23 months

All Child: 0-18 years

All Adult: 19+ years

Newborn: birth-1 month

Infant: 1-23 months

Preschool Child: 2-5 years

Child: 6-12 years

Adolescent: 13-18 years

Adult: 19-44 years

Middle Aged: 45-64 years

**Tag Terms** CLEAR

**Default Tag:** All Fields

GO Clear All Limits

- Click the GO button at the bottom of the screen to apply the selected limits to your search.
- Once your limits have been applied, they will be displayed in a yellow bar below the limits tab on the search results page. You will notice that you have fewer results in your list, but they will be much more focused and precise.

### Tip!



If you do not remove your selected search limits prior to beginning a new search, those limits will automatically be applied to all of your subsequent searches. Remove set limits by clicking on the check box next to the grey **Limits** tab.

## Substituting Keywords and MeSH Headings

You can change the focus of a search by making small changes to the search strategy. This technique may require slightly more time to complete successfully, depending on your familiarity with the PubMed database, but it is extremely valuable. For a more in-depth PubMed search tutorial, consult OPHLA's [Introduction to PubMed Searching: A Reference Guide](#).

One advantage of searching PubMed is that this database allows you to manipulate search strategies easily. To modify a search, follow the steps described below.

1. Click on the **Literature Searches** heading in the **General Resources** section of the OPHS website. Click on the hyperlinked search statement of your choice.
2. Click on the Details tab to review key terms and MeSH subject headings used in the initial search strategy.

NCBI PubMed A service of the U.S. National Library of Medicine and the National Institutes of Health

All Databases PubMed Nucleotide Protein Genome Structure OMIM

Search PubMed for (((((((Alcohol Drinking/epidemiology[Majr] OR Alcohol))) Go Clear

[Advanced Search \(beta\)](#) [Save Search](#)

Limits Preview/Index History Clipboard **Details**

Display Summary Show 50 Sort By Send to

All: 427 Review: 35

Items 1 - 50 of 427 Page 1 of 9 Next

1: [O'Brien MC, McCoy TP, Rhodes SD, Wagoner A, Wolfson M.](#) Related Articles, Links

Caffeinated cocktails: energy drink consumption, high-risk drinking, and alcohol-related consequences among college students.

Acad Emerg Med. 2008 May;15(5):453-60.  
PMID: 18439201 [PubMed - indexed for MEDLINE]

- You will be redirected to a page that displays the terms used to create the search strategy. Look for the block of text beneath the heading User query.

PubMed A service of the U.S. National Library of Medicine and the National Institutes of Health

My NCBI (Sign In) (Registered)

PubMed Nucleotide Protein Genome Structure OMIM PMC Journals Books

for ((((((Alcohol Drinking/epidemiology[Majr] OR Alcohol Drinking/prevention and control[Majr] OR Alcohol Drinking/statistics and numerical data[Majr] OR Alcohol Drinking/trends[Majr] OR Substance-Related Disorders/epidemiology[Majr] OR Substance-Related Disorders/prevention and control[Majr] OR Substance-Related Disorders/statistics and numerical data[Majr] OR Substance-Related Disorders/trends[Majr] OR "drugs, non-prescription"[MeSH Major Topic] OR "designer drugs"[MeSH Major Topic]) AND ("health surveys"[MeSH

Query Translation:

Result: 427

Translations:

Alcohol Drinking/prevention and control[Majr]	"alcohol drinking/prevention and control"[MAJR]
Alcohol Drinking/statistics and numerical data[Majr]	"alcohol drinking/statistics and numerical data"[MAJR]
Alcohol Drinking/trends[Majr]	"alcohol drinking/trends"[MAJR]
Substance-Related Disorders/epidemiology[Majr]	"substance-related disorders/epidemiology"[MAJR]
Substance-Related Disorders/prevention and control[Majr]	"substance-related disorders/prevention and control"[MAJR]
Substance-Related Disorders/statistics and numerical data[Majr]	"substance-related disorders/statistics and numerical data"[MAJR]
Substance-Related Disorders/trends[Majr]	"substance-related disorders/trends"[MAJR]
Drugs, Non-Prescription[Majr]	"drugs, non-prescription"[MeSH Major Topic]
Designer Drugs[Majr]	"designer drugs"[MeSH Major Topic]
Health Surveys[Mesh:noexp]	"health surveys"[MeSH Terms:noexp]
Prevalence[Mesh]	"prevalence"[MeSH Terms]
Epidemiology[Mesh:noexp]	"epidemiology"[MeSH Terms:noexp]
Population Surveillance[Mesh:noexp]	"population surveillance"[MeSH Terms:noexp]
Canada	"canada"[MeSH Terms] OR Canada[Text Word]
United States	"united states"[MeSH Terms] OR United States[Text Word]
Tobacco Use Disorder[Mesh]	"tobacco use disorder"[MeSH Terms]

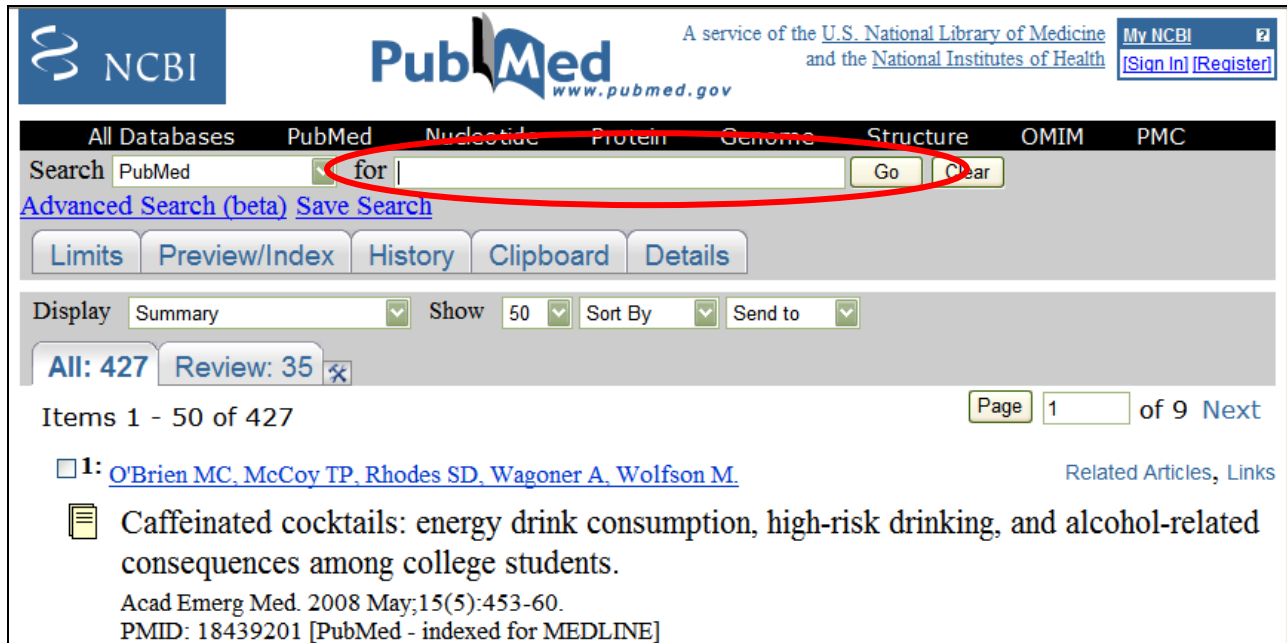
Database: PubMed

User query:

(((Alcohol Drinking/epidemiology[Majr] OR Alcohol Drinking/prevention and control[Majr] OR Alcohol Drinking/statistics and numerical data[Majr] OR Alcohol Drinking/trends[Majr] OR Substance-Related Disorders/epidemiology[Majr] OR Substance-Related Disorders/prevention and control[Majr] OR Substance-Related Disorders/statistics and numerical data[Majr] OR Substance-Related Disorders/trends[Majr] OR "drugs, non-prescription"[MeSH Major Topic] OR "designer drugs"[MeSH Major Topic]) AND ("health surveys"[MeSH Terms:noexp] OR "prevalence"[MeSH Terms] OR "epidemiology"[MeSH Terms:noexp] OR "population surveillance"[MeSH Terms:noexp])) AND ("canada"[MeSH Terms] OR Canada[Text Word] OR "united states"[MeSH Terms] OR United States[Text Word]) NOT "tobacco use disorder"[MeSH Terms] AND ("english"[MeSH Terms] OR french[Text Word]) AND ("last 3 years"[Text Word])

- Highlight this entire block of text, copy it, and then paste it into a Microsoft Word document. This will enable you to easily delete, add, or substitute words in the search strategy.

- Once you have modified the search strategy, copy the entire new strategy and paste it into PubMed's search box.



The following example will illustrate in more detail how to substitute keywords and search terms.

### Example:

Using the strategy from our search on the surveillance of alcohol and substance misuse, you can build a strategy that will retrieve articles on the effectiveness of community programs to prevent and treat alcohol- and substance misuse-related disorders.

The original search strategy looks like this:

```
((((((Alcohol Drinking/epidemiology[Majr] OR Alcohol Drinking/prevention and control[Majr] OR Alcohol Drinking/statistics and numerical data[Majr] OR Alcohol Drinking/trends[Majr] OR Substance-Related Disorders/epidemiology[Majr] OR Substance-Related Disorders/prevention and control[Majr] OR Substance-Related Disorders/statistics and numerical data[Majr] OR Substance-Related Disorders/trends[Majr] OR Drugs, Non-Prescription[Majr] OR Designer Drugs[Majr] AND (Health Surveys[Mesh:NoExp] OR Prevalence[Mesh] OR Epidemiology[Mesh:NoExp] OR Population Surveillance[Mesh:NoExp])) AND (Canada OR United States)) NOT Tobacco Use Disorder[Mesh]) AND (English[lang] OR French[lang])) AND ("last 3 years"[Pdat]))
```

- First you would copy the original search strategy from PubMed's Details section to a Microsoft Word document. From this strategy, you will keep all the alcohol- and

substance misuse-related MeSH terms and keywords (highlighted in grey above) and delete all other terms. You will be left with a string of words that looks like this:

(Alcohol Drinking/epidemiology[Majr] OR Alcohol Drinking/prevention and control[Majr] OR Alcohol Drinking/statistics and numerical data[Majr] OR Alcohol Drinking/trends[Majr] OR Substance-Related Disorders/epidemiology[Majr] OR Substance-Related Disorders/prevention and control[Majr] OR Substance-Related Disorders/statistics and numerical data[Majr] OR Substance-Related Disorders/trends[Majr] OR Drugs, Non-Prescription[Majr] OR Designer Drugs[Majr])

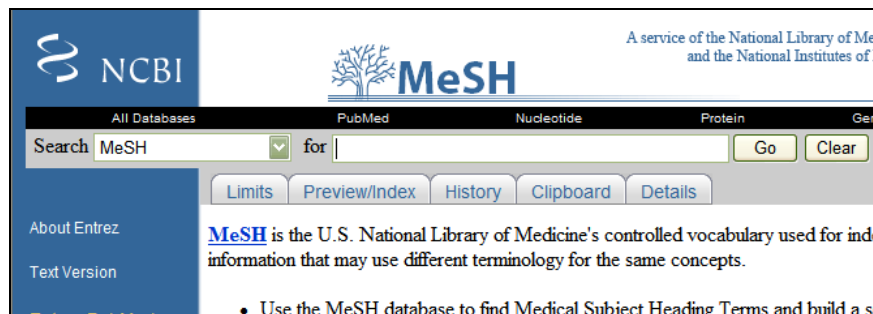
2. Because you are interested in community programs, you will need to add keywords and subject headings to the search strategy which capture this concept. You might add the following keywords to the strategy:

(“community programs” OR Community health planning[mh] OR Community health services[mh] OR Community networks[mh] OR Needle exchange programs[mh] OR Preventive health services[mh])

#### Tip!



You can find relevant subject headings by searching PubMed's **MeSH Database** at <http://www.ncbi.nlm.nih.gov/sites/entrez?db=mesh>. Type keywords into the MeSH search box to retrieve MeSH headings that relate to your topic.



When you add a MeSH heading to your search strategy, it should be immediately followed (no space!) by the following symbol: **[mh]**

For example: **Needle exchange programs[mh]**

- Put these two concepts together using the AND operator. Your NEW search strategy will look like this:

(Alcohol Drinking/epidemiology[Majr] OR Alcohol Drinking/prevention and control[Majr] OR Alcohol Drinking/statistics and numerical data[Majr] OR Alcohol Drinking/trends[Majr] OR Substance-Related Disorders/epidemiology[Majr] OR Substance-Related Disorders/prevention and control[Majr] OR Substance-Related Disorders/statistics and numerical data[Majr] OR Substance-Related Disorders/trends[Majr] OR Drugs, Non-Prescription[Majr] OR Designer Drugs[Majr]) AND ("community programs" OR Community health planning[mh] OR Community health services[mh] OR Community networks[mh] OR Needle exchange programs[mh] OR Preventive health services[mh])

Keywords and subject headings used to describe a single concept are connected with the **OR** operator and surrounded by round brackets. All operators such as **AND** & **OR** must be CAPITALIZED.

**DO NOT** delete any round brackets ( ) or modify search terms which are followed by the search codes [majr] or [mh] within an existing search strategy. This can dramatically skew the results of your search. In some search strategies, there may seem to be an excessive number of round brackets. However, these search operators are absolutely necessary for “nested” searching, which is a powerful and precise advanced searching capability in PubMed.

- Finally, you would copy the entire search strategy, paste it into the PubMed search box, and click the Go button.

### Tip!



You may find useful vocabulary to express public health concepts by clicking on the **Details** tab when you are reviewing the results of a search. To find search terms related to a particular topic, consult the topical list of literature searches in the **General Resources** section of the OPHS website.

# Systematic Reviews

## What is a Systematic Review?

Systematic reviews analyze, synthesize, and summarize virtually all available evidence (often hundreds of research studies) related to a particular topic. To conduct a systematic review, researchers must begin by performing a thorough and systematic literature search using an explicit and judicious search methodology. They must then critically appraise the retrieved literature according to a rigorous proscribed methodology to ensure that it is valid and applicable before including it in their final research synthesis. Selected studies are then subject to techniques such as meta-analysis to combine and cross-analyze their results. The level (or quality) of evidence provided by each study may also be graded, depending on the methodology used.

It can be difficult to distinguish systematic reviews from other kinds of review articles. According to the basic hierarchy of publication types, all review articles are classified together; in essence, a systematic review is a review article. However, not all review articles are created equal. A systematic review is a highly specialized, high-quality type of review article which is conducted according to a rigorous methodology.

However, systematic reviews are not infallible. It is just as important to critically appraise the methodology of a systematic review as it is to appraise any other kind of research study. For more information on critical appraisal, see the **Critical Appraisal of Evidence and Research** heading in the **General Resources** section of the OPHS website.

Many health care journals now publish systematic reviews, and most of these journals are indexed in MEDLINE (PubMed). There are also other sources of systematic reviews, some of which are listed in the next section.

The literature searches on the OPHS website do not focus exclusively on systematic reviews. For many public health topics, particularly those which have very recently emerged, systematic reviews have not yet been conducted. A systematic review cannot be completed until a certain number of preliminary studies have been conducted (in other words, there must be published literature available to summarize). If a systematic review limit were applied to certain searches on the OPHS website, no articles would be retrieved. However, the search strategies were constructed in such a way that systematic reviews will be included in the results along with other types of studies.

## Finding Systematic Reviews

### 1. Find reviews within PubMed search results

PubMed allows you to see only the “review articles” in your result set. However, results will include not only systematic reviews but other types of reviews as well (such as less rigorous summaries of a particular topic). To view these review articles, click on the tab called “Review” when you are looking at your search results. Now you will see a list of articles which are “reviews”. Further reading of the methodology will allow you to determine if the article truly is a systematic review or simply a “review article”.

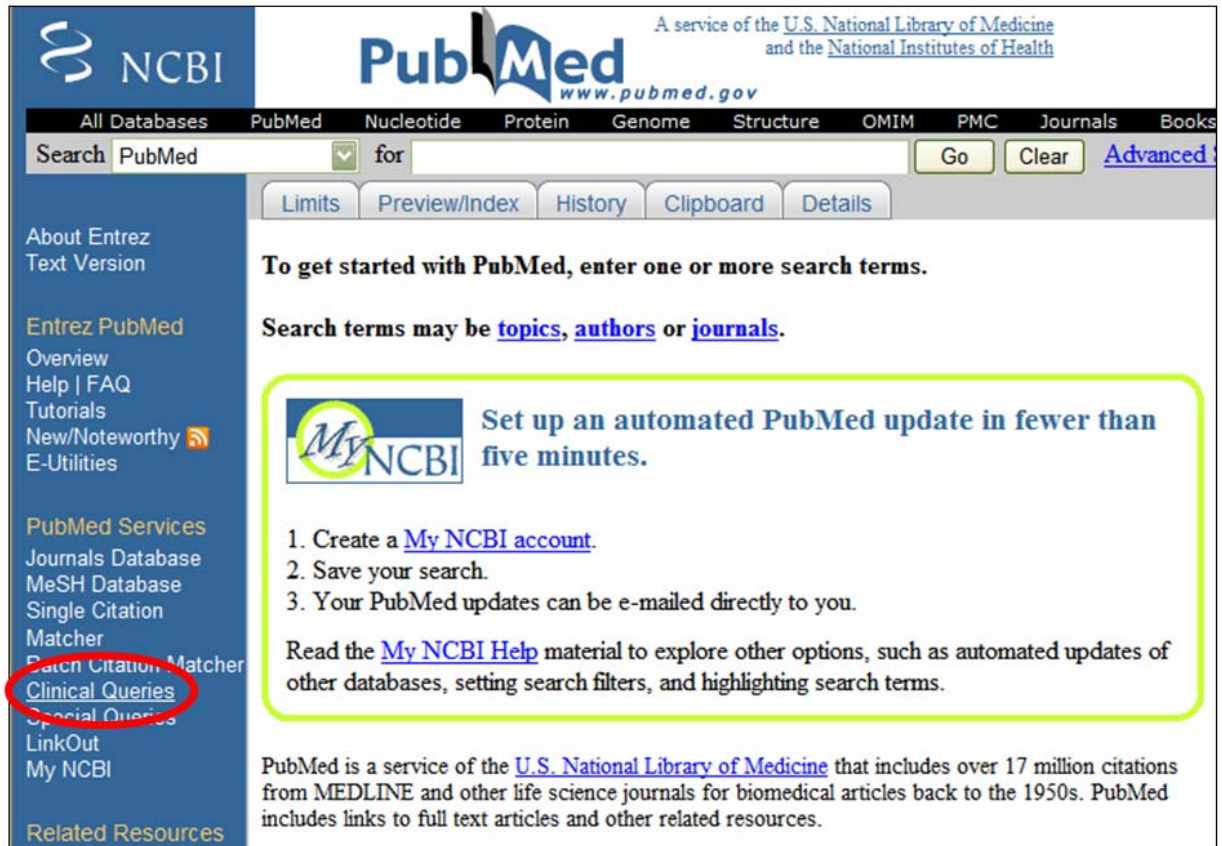


The screenshot shows the PubMed search interface. At the top, the NCBI logo is on the left, and the PubMed logo with the URL [www.pubmed.gov](http://www.pubmed.gov) is in the center. To the right, it states "A service of the U.S. National Library of Medicine and the National Institutes of Health". Below the logo, there are navigation tabs for "All Databases", "PubMed", "Nucleotide", "Protein", "Genome", "Structure", "OMIM", "PMC", "Journals", and "Books". The search bar contains the text "injury prevention" AND helmet\* and has buttons for "Go", "Clear", and "Save Search". Below the search bar, there are buttons for "Limits", "Preview/Index", "History", "Clipboard", and "Details". The "Display" dropdown is set to "Summary", and the "Show" dropdown is set to "20". The "Sort By" and "Send to" dropdowns are also visible. The search results are displayed in a list format. The first two results are highlighted in red:

- 1: [Li GL, Li LP, Cai QF](#)  
Motorcycle helmet use in Southern China: an observational study.  
Traffic Inj Prev. 2008 Jun;9(2):125-8.  
PMID: 18398775 [PubMed - in process]
- 2: [Khan I, Khan A, Aziz F, Islam M, Shafiqat S](#)  
Factors associated with helmet use among motorcycle users in Karachi, Pakistan.  
Acad Emerg Med. 2008 Apr;15(4):384-7.  
PMID: 18370995 [PubMed - in process]

2. Find reviews using the Clinical Queries tool.

PubMed also has a built in systematic review filter. To access it, go to the PubMed homepage at <http://www.ncbi.nlm.nih.gov/pubmed/> and select the Clinical Queries option:



The screenshot shows the PubMed homepage. The top navigation bar includes links for All Databases, PubMed, Nucleotide, Protein, Genome, Structure, OMIM, PMC, Journals, and Books. A search bar is present with a dropdown menu set to 'PubMed' and a search button labeled 'Go'. Below the search bar are buttons for Limits, Preview/Index, History, Clipboard, and Details. The main content area features a search prompt: "To get started with PubMed, enter one or more search terms. Search terms may be [topics](#), [authors](#) or [journals](#)." A highlighted box contains a "My NCBI" logo and the text: "Set up an automated PubMed update in fewer than five minutes." followed by a list of steps: 1. Create a [My NCBI account](#). 2. Save your search. 3. Your PubMed updates can be e-mailed directly to you. Below this is a link to "Read the [My NCBI Help](#) material to explore other options, such as automated updates of other databases, setting search filters, and highlighting search terms." At the bottom, a paragraph states: "PubMed is a service of the [U.S. National Library of Medicine](#) that includes over 17 million citations from MEDLINE and other life science journals for biomedical articles back to the 1950s. PubMed includes links to full text articles and other related resources." The left sidebar contains a list of links, with "Clinical Queries" circled in red.

You will be taken to the Clinical Queries screen; go to the Find Systematic Reviews section and enter your search terms in the search box.

3. Find reviews by adding a string of key terms to your search statement.

You can use a similar technique to the one described in the “Substituting Keywords and MeSH Headings” section. By adding the systematic review search string shown below to the end of your search statement, you can pull out some review articles on a topic.

(Oral hygiene[majr] OR Oral health[majr] OR Dental clinics[majr] OR Dental care[majr] OR public health dentistry[majr] OR dental caries[majr] OR tooth diseases[majr] OR dental care for children[majr]) AND (information dissemination[mh] OR communication/methods[mh] OR social marketing[mh] OR awareness[mh] OR health education[mh] OR health knowledge, attitudes, practice[mh]) **AND (systematic review\* OR meta analys\* OR metanalysis\* OR metaanalys\* OR "review of reviews")**

## Additional Resources for Finding Systematic Reviews

1. Health-evidence.ca

For a free, online registry of screened and appraised systematic reviews relevant to public health practice, see <http://www.health-evidence.ca>.

2. Cochrane Reviews

Note that Cochrane reviews are indexed in PubMed, so you should find them in your search results. However, you may also go directly to Cochrane to search for systematic reviews. See <http://www3.interscience.wiley.com>.

For more information about the Cochrane Health Promotion and Public Health Field, see <http://www.ph.cochrane.org/en/index.html>.

For a listing of reviews relevant to public health, see <http://www.ph.cochrane.org/en/newPage2.html>.

3. Canadian Best Practices Portal for Health Promotion and Chronic Disease Prevention

This site includes a comprehensive list of sources for systematic reviews relevant to public health. See “Selected systematic review sites” at <http://cbpp-pcpe.phac-aspc.gc.ca/>.

## Conducting Systematic Reviews

You may encounter a situation in which you are required to conduct a systematic review of all the literature on a particular topic. Systematic reviews can be quite time-consuming to complete; the average time suggested is six months of full time work<sup>1</sup>, though they often take up to 12 months or more to complete. They involve searching not only PubMed, but also any other databases that are relevant to the search. Hundreds of articles are typically reviewed and evaluated. Often, manual hand-searching of journal literature and contacting of key authors is also necessary.

Systematic reviews are resource-intensive. They require a team of researchers (including epidemiologists and evaluators), full library support (for literature searching and retrieval, as you may need several hundred articles in some cases), and specialized tools (e.g. statistical software such as SPSS). Unless you have adequate resources available, it is extremely difficult to conduct a scientifically valid and methodologically sound systematic review. Public health librarians can offer expertise on literature searching aspects of systematic reviews.

For detailed information about conducting systematic reviews in public health, consult the following two excellent resources from the Cochrane Health Promotion and Public Health Field:

- [Health Promotion and Public Health Systematic Review Handbook](#) and;
- [Guidelines for Health Promotion and Public Health Systematic Reviews](#).

The searches on the OPHS website support literature reviews which are more limited in scope than the systematic review process, but sufficient to provide evidence to support program development and implementation. This type of review tends to focus on the effectiveness of public health interventions. A simple way to retrieve review articles is to add the following qualifiers to the end of your search string:

**(Review\* OR meta analys\* OR metanalys\* OR metaanalys\* OR pooled OR effective\* OR evaluat\* OR evidence\* OR efficac\* OR outcome\* OR impact\* OR guideline\* OR best practic\* OR best practis\*)**

### Tip!



Remember that you will not find all relevant studies using these basic techniques. Application of more advanced searching methodology is necessary in order to retrieve comprehensive results. Contact your library for assistance.

<sup>1</sup> Jackson, N. (n.d.). *Health Promotion and Public Health Systematic Review Handbook*. Retrieved May 2, 2008, from [http://www.ph.cochrane.org/Files/Website%20Documents/HPPH\\_systematic\\_review\\_handbook.pdf](http://www.ph.cochrane.org/Files/Website%20Documents/HPPH_systematic_review_handbook.pdf).

# How to Obtain Articles (“Full Text”)

Try one or several of the following options to access full text articles:

## Option 1: Direct Link to Online Full Text from PubMed Abstract

Although PubMed is primarily an index to the journal literature, some PubMed abstracts include a direct link to an external website which provides the full text article free of charge. When you view the abstract of an article that is of interest to you, look for an icon in the top right-hand corner of the abstract which indicates that the full text is available for free on another website. One such icon is shown in the screen shot below; the icon may look different depending on which external site provides the full text. Click on this icon to view the full text article in a new window.

The screenshot shows the PubMed interface for a specific article. At the top, there is a search bar and navigation tabs. The article title is "Stages of development and injury: an epidemiological survey of young children presenting to an emergency department." by Macinnes K, Stone DH. The abstract text is visible. A red circle highlights a link icon in the top right corner of the abstract area, labeled "Full text free on... BioMed Central".

## Option 2: PubMed LinkOut to PublicHealthOntario.ca Virtual Library (public health practitioners in Ontario only)

Staff in Ontario’s public health units and the Public Health Division of the Ministry of Health and Long-Term Care (MOHLTC) have access to selected full text articles via the PublicHealthOntario.ca Virtual Library. In some cases, you will be able to access the full text of an article in the Virtual Library via a direct link from the PubMed abstract. You will be asked to enter your Virtual Library username and password prior to accessing the full text.

View the abstract of an article of interest. Click on the Links icon at the top right-hand side of abstract. From the small sub-menu that appears, click on LinkOut.

The screenshot shows the PubMed interface for an article titled "Survival and growth of foodborne microorganisms in processed and individually wrapped cheese slices." The article is by Linton RH and Harper N. The 'Links' icon in the top right corner is circled in red, and the 'LinkOut' option is highlighted in the sub-menu that appears.

You will be redirected to a page of LinkOut resources. Scan this page to see if EBSCO is listed as a full text source. If EBSCO is not listed, the article that you have chosen is not available in the Virtual Library. If EBSCO is listed in the table of full text sources, click on the Full Text link beside it.

The screenshot shows the LinkOut page for the article. The text reads: "The following LinkOut resources are supplied by external providers. These providers are responsible for maintaining the links. What does the icon mean?" Below this, there is a list of resources. Under the "Full Text Sources" section, the "EBSCO" link is circled in red, with a "Full Text" link next to it.

A new window will open directing you to the full text article. You may be prompted to enter a username and password. Enter your Virtual Library login information. If you are an employee

of an Ontario public health unit or the MOHLTC Public Health Division but do not have a Virtual Library login and password, contact your institution's public health library to obtain this information (public health unit staff without access to an in-house library may contact [beata.pach@ontario.ca](mailto:beata.pach@ontario.ca) or [allison.mcarthur@ontario.ca](mailto:allison.mcarthur@ontario.ca) for access instructions).

### Option 3: Open Access Online Journals

The full text of every article published in an “open access” journal is available for free online. However, PubMed does not provide direct links to all open access journal articles.

One way to check if the journal in which your article is published provides free online content is by accessing the OPHLA [Open Access Public Health e-Journals](#) document.

Links to additional open access journal directories can be found in the OPHLA [Web Search Tools](#) document.

### Option 4: Your Institution's Library Service

Many Ontario public health units provide library services to staff. If you have access to library services through your home institution, contact library staff to inquire about retrieving full text articles.

### Option 5: Single Article Purchase from the Publisher's Website

Virtually all publishers sell electronic or print copies of individual articles via their websites. Expect to pay about \$20 per article (prices vary by publisher). Publishers often offer a few free full text articles via a sample issue or other special promotion.

Search for the full name of the journal in quotation marks (e.g. “New England Journal of Medicine”) or a phrase from the title of an article (e.g. “Survival and growth of foodborne microorganisms”) to find the journal publisher's website. Check to see if the article you want is available for free after registration or as part of a special issue. If it is not available for free, follow the publisher's instructions for purchasing individual articles.