

Responsible and Efficient Literature Searching

This guide was prepared by Washington University librarians from both the Danforth Campus Libraries and Becker Medical Library. Availability of some resources and services vary depending on your campus location or affiliation.

If you need further assistance, please do not hesitate to contact your library:

[Becker Library](#) | [Ask-A-Librarian](#)
[Danforth Campus Libraries](#) | [Ask Us!](#)

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❖ What is a Quality Literature Search?

A quality literature search is a systematic review of published literature and other materials on a specific topic or clinical question.

A responsible search involves:

- Use of more than one database or resource including the Web
- Use of appropriate and cross-disciplinary databases
- Performing a search as far back as possible to track the earliest research or documentation
- Identification of appropriate authority terms and keyword terms
- Identification of what is known
- Identification of the gaps in the knowledge
- Use of primary sources including peer-reviewed materials
- Reading the full text content of materials
- Following up on relevant cited references
- Locating authors or institutions that specialize on the topic or clinical question
- Identification of possible adverse events or potential harm for human subjects

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- Awareness of the validity of the methods used for a particular study
- Documentation of resources used and search strategies
- Documentation of findings for proper attribution and prevention of plagiarism

❖ What is Comprehensive Literature Search?

A comprehensive literature search is one that identifies the first recorded research or descriptions on a particular topic or clinical question. This is done by an iterative search of the literature for a series of citations to locate developments and trends on a particular topic or clinical question over an extended period of time.

How to know when you've exhausted the literature?

- Do your research results provide a clear chain of evidence in demonstrating the accumulation of knowledge on a particular topic?
- Did you find the first description or research of a particular topic?
- Do scholarly books or monographs verify the first description or research on your particular topic?
- Do your research results using more than one resource continually refer to the same core group of authors and papers?
- Do your research results using more than one resource refer to the same person or research group as being the first to identify or describe a particular topic?
- You have followed up on relevant references and synonyms that you discover in your searching.
- You have located the most current information on the topic.
- Did you consult with your professor or recognized experts in the field to ask if they are aware of research you may have missed?
- You have checked all your references for errata or retractions.
- You have used a search engine to search the Web to locate materials not indexed by databases.

For Undergraduate and Graduate Students

For most undergraduates and graduates you should follow the guidelines of your instructor. In the absence of direction, it is generally acceptable to build your paper on five or six examples of secondary analysis (articles, books, reports, etc.) You may use other types of resources in the grid to support your position, but you will need to concentrate on scholarly, peer-reviewed material to produce a paper.

For Doctoral and Post-Doctoral Students

Doctoral students and faculty are expected to create and publish secondary analysis, often built on original analysis of data sets and statistics. For doctoral students, the research process is continual, and open-ended, and often lasts throughout your career.

Please contact library staff for more assistance with literature searching or for searches that involve human subjects.

❖ Databases and Resources

Databases and print indexes vary by subject coverage, date coverage, indexed content and other features.

Subject Coverage: The first step is to determine which databases to consult to locate the material related to the topic or clinical question. Where to start? It depends on the nature of the topic or clinical question. Many databases are subject or discipline specific. For example, for location of a systematic review related to a clinical question, the Cochrane Library database would be a good place to start. For a topic related to engineering, Engineering Index (Compendex) would be recommended. For education related topics, ERIC or Education Full Text, are two examples of databases. If you need to search for papers and related materials of a well-known figure from the 19th century, a finding aid for that person would be the resource to use. For best results, use multiple resources.

Date Coverage: Online databases are often produced from their print counterparts, usually called periodical indexes. Unlike their printed versions, online databases cover multiple years within a single search. Many publishers ceased updating or producing printed periodical indexes in favor of maintaining their online databases. However, their online databases may not cover all the years their index was available and it is sometimes necessary to consult the printed indexes for access to older citations. Most electronic databases start with articles from the 1980s; with some containing citations dating from the 1880s.

Indexed Content: While most databases such as PubMed contain citations to journal articles, other databases such as PsycINFO and the Cochrane Library, include citations of dissertations, book chapters, clinical guidelines or other content.

Consult the user's guide or select the help icon for each database to determine the subject coverage, range of years covered, indexed content and availability of full text content.

Many electronic full text journals that are subscribed to by the Danforth Campus Libraries and Becker Medical Library are linked from our databases. This allows you to search in a database, then link from a citation in that database directly to the full-text article without exiting the database. Databases have different ways of noting full text availability depending on the publisher or vendor. Some databases display a link to the Journal on the results page; others display the link in the abstract of the citation. Some links are icons; others are text based. Some databases include the full text that they are indexing. See [Linking to and Obtaining Full Text Material](#).

Becker Medical Library

- [Getting Started at Becker Medical Library](#)
- [Database Gateway at Becker Library](#)
- [Information Services and Training Program](#)
- [Databases/Resources Recommended for Bioinformatics](#)
- [Becker Databases on del.icio.us](#)
- [Archives and Visual Collections Resources at Becker](#)

Danforth Campus Libraries

- [Research Help at Danforth Campus Libraries](#)
- [Databases at Danforth Campus Libraries](#)
- [Databases Recommended for Sciences, Humanities or Social Sciences](#)
- [Subject List in Find it!](#)
- [Databases/Resources Recommended for Special Formats](#) (non-journals or books)
- [Special Collections Resources at Danforth Campus Libraries](#)
- [WU Libraries User Education](#)

❖ How to Search

First identify the topic or clinical question and break down the search query into individual subjects and then conduct separate searches on each subject. For example, let's say you want to find the coping mechanisms of adolescents who have been diagnosed with cancer. When breaking that query into separate queries you have the subjects of adolescents, coping, diagnosis, and cancer. You will then want to perform separate searches on each of those subjects. Combine searches using the "history" tool found on many databases. No two databases will produce identical results based on the same search query; for best results use multiple databases and a variety of terms/keywords. Each database used will differ in the functions and features offered. For details on each database, please select the user's guide or help icon.

How to Formulate a Query

To help with formulating a search query based on the topic or clinical question it is helpful to use a variety of terms, ranging from subject headings, thesauri terms, author keywords, and synonyms.

Subject Headings

- [Medical Subject Headings](#) (MeSH)
- [Library of Congress Subject Headings](#) (LCSH)

Thesauri

- [Education Resources Information Center Thesaurus](#) (ERIC)
- [Getty Thesaurus of Geographic Names](#)
- [National Agriculture Library](#)
- [UNESCO Thesaurus](#)

Author Keywords

Some databases utilize author keywords, which are keywords assigned by the author to best describe the content of their work and supplements the standardized subject headings used by database vendors. Author keywords are usually noted in the abstract page of the work. Using subject headings and keywords will help you understand the broader context of your research and lead to additional terms to use for your research task.

Synonyms

If a particular term does not produce results, try using different words. For example, results from the query, "hearing protective devices" will vary from results using "hearing protection devices" and "ear protective devices."

❖ Types of Literature

Primary Source Literature

Primary source literature refers to original source materials that are created using scientific methods, without use of interpretation and review, and also includes materials that contain information recorded at the time of creation. Some original source material is subject to the peer review process. Peer review is defined as an organized procedure carried out by a select committee of professionals in evaluating the performance of other professionals in meeting the standards of their specialty. Review by peers is used by editors in the evaluation of articles and other papers submitted for publication. Most journal articles are subject to the peer review process.

Examples of Primary Source Literature:

- Data Sets
- Statistics
- Conference Proceedings
- Journal Articles
- Dissertations
- Manuscript Letters
- Trial Transcripts
- Birth Certificates
- Patents

Secondary Source Literature

Secondary source literature refers to materials that are interpretations or evaluations of primary source materials using scholarly analysis. This may also include journal articles or dissertations that review or evaluate previous research.

Examples of Secondary Source Literature:

- Books/Monographs
- Practice Guidelines
- Dissertations
- Biographies
- Commentaries

Reference Materials or Tertiary Sources

Reference materials or tertiary sources are materials that are useful in conducting a review of the literature. These materials are helpful in identifying key subject areas and persons affiliated with a particular topic.

Examples of Reference Materials:

- Bibliographies
- Encyclopedias
- Popular press
- Technical or government reports
- Directories
- Almanacs
- Atlases

Literature for Social Sciences

Resource Type	Description	Examples	How do I know if it's a credible source?
Primary Data Sources <ul style="list-style-type: none"> • Data sets • Statistics 	Information gathered and compiled using scientific methods	Data sets: General Social Survey Statistics: Consumer Price Index	1. Check to see who produced the data- governments, international organizations are generally reliable 2. Look at how the study was conducted
Secondary Analysis	Scholarly analysis (books, articles, reports, websites, etc)	Campbell Collaboration, National Guideline Clearinghouse	Peer review process; Reputable publisher
Reference Materials	Encyclopedias, Handbooks, Dictionaries, Directories, Almanacs, Atlases	DSM IV, International Encyclopedia of the Social Sciences	Reputable publisher
News, Internet Blogs,	Immediate news and information release	New York Times, Washington Post, etc.	Reputable author or publisher
Testimonials	First hand experiences and recommendations		Evaluate the speaker- does it make sense? Is it validated by other findings or data? Who triggered the message?
Sponsored studies, articles and reports	Material /research paid for by a particular company, consultants or a special interest group.	Studies sponsored by tobacco industry, or pharmaceutical companies	Beware of bias of sponsor. Do they have a particular message or point of view they are promoting?
Corporate websites, press releases or advertising	Information produced and released by companies to further their mission		Identify the underlying audience and message; beware of bias of creator

*Prepared by Carol Mollman, Barb Rehkop, and Sylvia Toombs from the Danforth Campus Libraries.

Clinical Literature

When searching for literature related to a clinical question, there is a hierarchy of what types of research publications are considered the best source of clinical information. The ideal source is a systematic review of randomized, controlled trials followed by other systematic reviews and meta-analyses. Other resources to consult are:

- Evidence Guidelines
- Evidence Summaries
- Randomized Controlled Trial Case Cohorts and Control Studies
- Clinical Research Critiques
- Other Reviews of the Literature
- Case Reports, Case Series, Practice Guidelines
- Clinical Reference Texts

[Users' Guide to the Medical Literature](#)

❖ Database Tips

Each database used will differ in the functions and features offered. For details on each database, please select the user's guide or help icon. Do not get discouraged if you do not receive the results you hoped for. Questions to ask are:

- Can the query be paraphrased or re-worded?
- Did you use correct spelling in all your queries? One misspelling can produce negative results.
- Are there any other keywords or subject headings to consider for the query?
- Did you investigate all background information?
- Did you search in more than one database? One database will not contain all references or citations.
- Did you familiarize yourself with the features of each database?

Research is a skill that is best learned through trial and error. You will learn the most from your mistakes, not your successes.

❖ Database Tools

Cited Work Search

If you locate a citation that you would like to follow up on, use the Cited Works or Cited By feature that is available on some databases such as ISI Web of Science and SCOPUS*. This feature allows for location of all citations that cite a specific article since its publication.

*Scopus is available to WU School of Medicine and WU School of Engineering users only.

Cited Author Search

A cited author search is a feature that allows you to locate articles published by a particular author. Scopus and ISI Web of Science offer an author search feature.

Single Citation Matcher

The PubMed Single Citation Matcher is a tool to use to provide full citation information if you are missing part of the citation. For example, if you have only the page number and the author name, [Single Citation Matcher](#) will search the PubMed database for the appropriate citation.

The Danforth Campus Libraries have a [Citation Linker](#) tool that can be used to locate citations.

Journal Abbreviations

Most databases will give you tools for interpreting their specific journal abbreviations. Some fairly comprehensive lists of journal abbreviations are also freely available on the web. Many lists of journal abbreviations can also be used to verify the ISSN of a journal before submitting a request for an article via Interlibrary Loan.

- [PubMed Journals Database](#)
- [Journal Abbreviation Resources on the Web](#)
- [All that JAS](#)

Related Articles Link

Some databases include a tool called “related articles” or “more like this” which lead to other articles of the same topic. The related articles link is usually found on the citation abstract page or the listing of results.

Limits Option

Some databases offer limits tools. This allows you to refine your search to a particular language, a publication type, year/s of publication, gender, age groups, humans or animals, full text materials, journal sub-sets, to name a few.

History Option

Many databases offer an option to view your search history. This allows you to separate your search query into individual search strings and to combine select searches.

Advanced Search Options

Many databases have advanced search options that allow for searching of multiple search queries using Boolean combinations, assigning certain terms as operators or field qualifiers, certain date ranges, full text only options, abstracts only options, specific language options, to name a few.

Registration

Many databases offer free registration. Registration allows you to save your searches and to set up alerting services to be notified of new publications related to your query or when a publication or author you are tracking is cited. Each database offers different options - for details on each database, please select the user’s guide or help icon.

❖ Special Literature Searches

Archives (letters, personal papers and records)

- [Archives and Visual Collections Resources at Becker](#)
- [Special Collections Resources at Danforth Campus Libraries](#)

Finding Aids

Becker Medical Library

- [Personal Collections](#)
- [Institutional Collections](#)

Danforth Campus Libraries

- [Manuscript Collections](#)

Historical Literature Searches

There are electronic databases and print indexes available for use for historical literature searches. Examples include:

Electronic databases

- CINAHL Plus (1937 to current; nursing and allied health)
- Eighteenth Century Collections Online (ECCO) (1700-1800; English literature)

- Historical Abstracts (covers the history of the world from 1450 to present)
- INSPEC (1898 to current; physics and engineering)
- IndexCat (1880-1940s: medical journals and book literature)
- PsycINFO (1806 to current; psychology)
- PubMed (1950s to current; medical literature; limit your search to “History of Medicine”)
- SciFinder (1907 to current; chemistry and science)
- JSTOR (1665 to current; searchable full text literature from many disciplines)

Print indexes

- Index-Catalogue of the Library of the Surgeon-General's Office, U.S. Army, Series 1-5 (1880-1961, medical literature)
- Index Medicus (1879 to 1956; medical literature)
- Pharmacopoeia of the United States (19th century; medical literature)
- Science Citation Index (1965-1988; science literature)

[History of Medicine Resource Guide](#)

❖ Interpreting and Evaluating the Results

Evaluating the sources you locate is a crucial step in the process of researching. Questions to ask when you consider the appropriateness of the information are:

- What are the credentials of the author?
- Does the author’s bias appear?
- Who is the author affiliated with?
- What is the date of the publication?
- Is it pertinent and up to date?
- Is it the most recent edition or revision?
- What is the reputation of the publisher?
- Is there adequate documentation? Bibliography, notes, credits?
- Who has the author cited in their references?
- To what extent are the methods valid and reliable, and/or the treatment logical?
- Are the methods competent and appropriate?
- Are samples and sampling procedures and sizes adequate and identified?
- Is the information well researched using appropriate scientific research methods and supported with evidence?
- Are the results logical or speculative? Do they answer the query?
- Do the claims, interpretations, and conclusion follow logically from facts collected or observations made?
- Do conclusions relate to the hypotheses or questions asked?
- Use of primary or secondary sources of information?
- Is it peer-reviewed?

[Research Help: Evaluate Resources](#)

❖ Doing a Literature Search Off-Campus

Becker Medical Library

Use proxy or VPN to access Becker Library electronic resources (databases, journals, books and course reserves) off-campus.

- [Proxy Accounts](#)
Databases that require a password/username do not require the use of proxy. One example is OVID.
- [VPN Accounts](#)
There may to some restrictions to access to Becker electronic materials. For more information, see [Restrictions on Access to Electronic Resources](#).

Danforth Campus Libraries

Use proxy or VPN to access Danforth Campus Libraries electronic resources (databases, journals, books and course reserves) off-campus. Some resources are not available to off- campus or non-affiliated users.

- [Proxy Accounts](#)
- [VPN](#) or contact your department for alternatives

❖ Linking to and Obtaining Full Text Materials

Becker Medical Library

Link-Out Feature

Many electronic full text journals that are subscribed to by Becker Library link to our databases - this is referred to as “link out.” Link out allows you to search in a database, then link from a citation in that database directly to the full-text article without exiting the database. Databases have different ways of noting full text availability depending on the publisher or vendor. Some databases display a link to the Journal on the results page; others display the link in the abstract of the citation. Some links are icons; others are text based. Databases that link to full text include PubMed, SCOPUS, ISI Web of Science, and OVID.

Becker Library Examples:



View at Becker Library



This indicates that Becker Library holds the full text in print format. We often hold both the print and electronic format of a journal.

Publisher/Vendor Examples: (Some of the many examples)




If you are unable to find an icon or an icon that does not lead you to the full text article, go to the [Becker Catalog](#), and do a search for the journal title. There are some citations that slip through the cracks and do not have the icons noted on the abstract page. Some publishers do not allow for link out capability.

Interlibrary Loan Options

Full text articles from journals, books, conference proceedings, standards, dissertations, etc., not held by Becker Library will need to be ordered via [Interlibrary Loan/Document Delivery \(ILLiad\)](#) services.

Danforth Campus Libraries

Linking to Full Text

Link-out from Danforth Campus Libraries is a tool called “[Get it!](#)” . Some databases also have direct links to full text such as the publisher/vendor examples above.

Interlibrary Loan Options

Full text articles from journals, books, conference proceedings, standards, dissertations, etc., not held by Danforth Campus Libraries will need to be ordered via [Interlibrary Loan/Document Delivery \(ILLiad\)](#) services.

❖ Saving Your Search Queries

Many databases offer free registration for that allow users to create alerts for:

- Search Alerts: Save searches on a topic to receive an alert when new articles are published on that topic
- Author Alerts: Save searches by an author to receive an alert when that author publishes a new article
- Citation Alerts: Save a search for a particular citation to receive an alert when that article is cited by another article

Alerts can be set to run daily, weekly, or monthly and can be sent via email or RSS feed. Each database offers different options - for details on each database, please select the user’s guide or help icon.

❖ Keeping Current

Examples of Blogs

- [Academic Blogs](#)

Examples of Journal Alerts

- [Elsevier Journals](#)
- [HighWire Press Journals](#)
- [Oxford Journals](#)
- [Sage Journals](#)
- [Science Direct](#)
- [Springer Journals](#)
- [Thieme Journals](#)
- [Wiley InterScience Journals](#)

Databases and Search Engines

- [Database and Search Engine Alerts](#)
- [Google Alerts](#)

Examples of RSS Feeds

- [Using RSS Feeds to Keep Current with Medical Literature](#)
- [Medworm](#)
- [Humanities and Social Sciences](#)

General

- [5 Tips to Stay Up to Date with Medical Literature](#)

❖ Washington University Library Services

Danforth Campus Libraries and Bernard Becker Medical Library

- Customized personal or group training or consultation sessions
- Hands-on workshops
- House-calls to your office to assist with research needs
- Guidance for literature search (current and historical)
- Assist with setting up table of contents alerts from journals
- Assist with setting up automated database search alerts
- Assist with importing citations from databases to your bibliographic software
- Consultation on copyright questions - contact [Cathy Sarli](#) for more information.

❖ Resources

Becker Library

[Becker Library](#) | [Ask-A-Librarian](#)

- [Becker Library Scholarly Communications Portal](#)
- [Evidence-Based Medicine](#)
- [Getting Started](#)
- [How to Find Journals and Journal Articles](#)
- [Information Services and Training Program](#)
- [List of Classes](#)
- [Searching Basics](#)
- [Subject Guides](#)
- [Research and Publishing Support for Authors](#)
- [Using Reference Resources – Tutorials and Tips](#)

Danforth Campus Libraries

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- [Danforth Campus Libraries Scholarly Communications](#)
- [List of Classes](#)
- [Reference Sources](#)
- [Research Help](#)
- [Subject Guides](#)
- [Tutorials and Tips](#)