

Searching the Medical Literatures through Internet: Review of MEDLINE Database

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The medical community can derive a lot of benefit from Internet. However, to do so effectively it will have to take care of a few problems first, especially regarding indexing and reliability of sites. The number of doctors and medical professionals are being increased to use Internet for accessing medical information. We will find that our search skill will improve as we gain greater understanding of search terminology, search tool use and the way of information is stored and retrieved.

Internet:

A revolution of the 20th century is the invention of Internet. Internet is a vast international network of electronic system that links host computer and users in a digital web. With the usage of Internet, it is possible to access and download various information.

Browser:

Browser is an application that resides on your computer or on server. The browser lets you access information available on the web from anywhere in the world. The website is accessed by a browser.

1. Mosaic (The first graphic based web browser, became available in 1993)
2. MS Internet Explorer (1995)
3. Netscape Navigator
4. Mozilla Fire fox
5. Opera

Netscape Navigator and MS Internet Explorer are the two most popular browsers in use today, and their functions overlap about 90% of the time.

Search Engines:

Search Engine is a program that searches documents for specified keywords and returns a list of the documents where the keywords are found. Although it is really a

general class of programs, the term is often used to specifically describe system. It is basically an index of web and is designed to catalogue all the WebPages on the Internet, so that our search becomes easy when looking for any information. It enables the user to search for documents on World Wide Web and USENET newsgroups.

There are various search engines available. As different search engines operate differently, for example, some use individual key word or phrases while others allow searches with a wild card or Boolean operators.

The following useful search engines are available on the Net.

1. Google (www.google.com)
2. Yahoo (www.yahoo.com)
3. Altavista (www.altavista.com)
4. Infoseek (www.infoseek.com)
5. Excite (www.excite.com)
6. Lycos (www.lycos.com)
7. HotBot (www.hotbot.com)
8. Scardholot (www.scardholot.com)
9. Looksmart Findarticles (www.findarticles.com)
10. Ask Jeeves Your Questions (www.arkjeeves.com)

There are now medical search engines, which confine their searches to medical and health information. These help the user to keep him in the health territory so that one is not lost in the maze of irrelevant information. Some of the medical search engines are as below:

1. Pubmed (www.pubmed.com)
2. Popline (www.popline.org)
3. Medmatrix (www.medmatrix.org)

Database:

Database is an organised set of data that is stored in a computer and can be accessed at and used in various ways.

Bibliographic database:

Bibliographic database means the published list of documents, which are indexed in computer using special software systematically. It is a collection of various information of published documents. It helps the information seekers to find out the way of right information quickly. It is the descriptive and organised list of published documents/information stored in computer and can access and download the information in our usage with the help of computer.

Medical database:

Medical database is also the collection medical literatures, which are published and are indexed or arranged systematically. There are many medical databases using for indexing and accessing the medical literature. Many medical literatures are indexed in huge databases, access to which is almost universal in medical and science libraries in developed countries. Searching medical literatures from various medical databases is challenging due to its searching techniques and indexing procedures. Medical literatures searches have become more complex because of the increasing amount of published material and multiple available medical databases indexing those publications.

The volume of new information being added to the medical literature is expanding quickly. Hence, computer assisted literature searches frequently are used to access the right information at the right time.

The Collection of independent work, data or other material containing medical data and other relevant information, which are arranged in an organised and systematic manner and can be accessed electronically or by other means is called medical database.

The following are the well-known online medical databases being used by the medical professionals for retrieval medical information.

1. Medline Database
2. Cochrane Database
3. Publine Database

History of MEDLINE.

The origins of MEDLINE can be traced back to a collection of books in the US Surgeon General's Office during the American Civil War and John Shaw Billings' decision, during 1867, to make this Library as complete as possible. From these beginnings, Index Medicus was developed in the early years of the 20th century, and electronic versions of the database began with the computerized on-demand search service MEDLARS in 1964 and then via CD-ROM and Internet Grateful Med to the web-based and free-to-all service, PubMed, in 1997. MEDLINE providers are now offering mapping of natural language queries to the sophisticated indexing vocabulary (Medical Subject Headings, MeSH) and the provision of specific filters for different types of publication to improve searching efficiency, as well as links to full-text versions of the papers where available.

MEDLINE Database (www.ncbi.nlm.gov)

Medline database is the bibliographic database, compiled by the U.S. National Library of Medicine (NLM) and published on the Web by Community of Science. MEDLINE is the world's most comprehensive source of life sciences and biomedical bibliographic information. It contains nearly eleven million records from over 7,300 different publications from 1965 to today. It is updated weekly.

MEDLINE (Medline, Medical Literature Analysis and Retrieval System Online) is a comprehensive literature database of life sciences and biomedical information. It covers the fields of medicine, nursing, dentistry, veterinary medicine, and the health care system. As perhaps a side effect of covering these fields, it also manages to cover nearly all of biology and biochemistry, even covering fields with no direct medical connection, such as molecular evolution.

It is compiled by the National Centre for Biotechnology Information (NCBI) of the U.S. National Library of Medicine (NLM) and freely available on the Internet through PubMed, searchable with the Entrez engine.

The database contains over 14 million records from more than 4,800 different publications (mainly medical journals) from the 1950s to today, and new citations are added daily. Newer citations include abstracts of the article in question. It is designed to have global coverage, but most records are from English-language sources or have abstracts in English.

MEDLINE uses Medical Subject Headings (MeSH) for information retrieval. Engines designed to search MEDLINE (such as Entrez) generally use a mathematical scoring system to tailor results as closely as possible to the specific request made. One of the interfaces for searching Medline is PubMed, provided by the NLM for free access via the Internet (www.pubmed.gov). Also searchable with the PubMed interface are non-Medline citations, i.e. articles supplied by publishers to the NLM. Direct access to an electronic full text version is also possible if the article is available from a publisher or institution participating in Linkout (www.ncbi.nlm.nih.gov/entrez/linkout/). Some publishers provide free access to their journals. Other journals require an online license and are fee based. The following example demonstrates some of the most important search functions in PubMed. We will start out with a fast and simple approach without the use of specific searching techniques and then continue with a more sophisticated search that requires the knowledge of Medline search functions.

Version of MEDLINE

Three versions of the information in Medline are available:

1. Printed (the index Medicus, a manual index updated every year, from which the electronic version)
2. Online (the whole database from 1966 to date on a mainframe computer, accessed over the Internet on the other electronic server).
3. CD-ROM (the whole database on between 10-18 CDs depending on who makes it)

What is PubMed System?

PubMed is a service of the National Library of Medicine that includes over 15 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 through which Medline database can be accessed. PubMed provides access to MEDLINE and over 12 million citations in the medical literature. When searching in PubMed you can apply various "limits," such as what fields the search term is in (eg, author, title, text word, journal), type of report (eg, clinical trial, review, editorial), language, patient age, gender, and human or animal study.

PubMed system is designed to be used with Boolean Logic, i.e. putting in particular words (such as sinus, therapy, diagnostic and so on) linked by operator such as AND, OR, NOT. The "Boolean operators" (AND, OR, and NOT) can further focus and refine your search. However, to be sure that you retrieve all the files of interest and don't miss any files that might be critical to your understanding of the topic, you must search all fields and be careful not to exclude potentially important files with the NOT operator.

How to trace the MEDLINE database?

Medline database can be traced through PubMed system (search engine). Remember that articles can be traced in two ways:

1. By any word listed on the database including words in the title, abstract, authors' name, and the institution where the research was done (Note: the abstract is a short summary of what the article is about, which you will find on the database and at the beginning of the printed article).
2. By a restricted thesaurus of medical title, known as medical subject heading (MeSH) terms.

Some common problems for searching the medical literatures through Medline. The problems are as follows with answer:

► **You are trying to find a particular paper, which you know, exists.**

Ans: - You should search the database by field suffix (title, author, journal, institutions, etc.) or by textwords. If we know the title of the paper and perhaps the journal where it was published, we can use the title and journal search keys (field suffix).

There are some useful search field suffixes.

Syntax	Meaning	Example
.au	Author	dixit, h.au
.jn	Journal	kumj.jn
.ti	Word in title	epilepsy.ti
.yr	Year of publication	1995.yr
.ab	Word in abstract	epilepsy.ab
.tw	Word in title or abstract	epilepsy.tw
.me	Single word, wherever it may appear as MeSH term	epilepsy. me
.in	Institution/Co-authors	Bir Hospital.in
.pt	Publication type	Editorial.pt

► **By using the search field suffixes and field suffixes, you can search as below:**

You want to search for "A survey of cervical cancer screening in people with learning disability", which you remember seeing in NEJM a couple of years ago. You can search it in Medline database through PubMed system as: -

- i. survey.ti (This gives you approximately 3500 possible articles)
- ii. cervical cancer.ti (This gives you approximately 450 possible articles)
- iii. learning disability. ti (This gives you approximately 95 possible articles)
- iv. NEJM.jn (This gives you several thousand articles published in NEJM listed in Medline database)
- v. (cervical cancer AND survey AND learning disability).ti and NEJM.jn (This gives you the particular article which you are searching.
- vi. (cervical cancer AND survey AND learning disability).ti and NEJM.jn AND 2003.yr (This gives you the particular article published in NEJM in the particular year)

► **If you cannot remember the title of the article you want but you know some exact key phrases from abstract.**

Ans: You may search under text word than MeSH .The field suffixes .ab (abstract),.tw (textword) and .pt (publication type)etc.Suppose you are trying to find out an editorial from one of the medical journals (you cannot remember which) in 2003 about evidence based medicine. You can do the following search technique in this database:

- i. evidence based medicine.tw and 2003.yr (This may give you a total about 150 articles about evidence based medicine.
- ii. evidence based medicine.tw and 2003.yr AND editorial.pt (This may give you 50 articles).

However, this method will only pick up articles with the exact string " evidence based medicine" as a textword.. It will miss the articles about " evidence based health care". For this you need to search under MeSH terms.

► You want to get general information quickly about a well-defined topic.

Ans: - You should use subheadings and/or the "Limit Set Option".

Some useful " Limit Set Options" are as

S/No	Limit Set Options
1	AIM Journal
2	Review articles
3	Male
4	Human
5	English, French...
6	Nursing journal
7	Cancer journal
8	Abstract
9	Editorial
10	Original articles
11	Local holdings
12	Publication year

There are some useful subheadings:

Syntax	Meaning	Examples
/co	Complications	Measles/co
/ct	Contraindications (of drug)	poprnonolol/ct
/di	Diagnosis	depression/di
/dt	Drug Therapy	depression/dt
/ed	Education	asthma/ed
/hi	History	mastectomy/hi
/nu	Nursing	cerebral palsy/nu
/og	Organization/Administration	health service/og
/pc	Preventive and control	influenza/pc
/th	Therapy	hypertension/th
/tu	Therapeutic use (drug)	aspirin/tu
/ep	Epidemiology	poliomyelitis/ep
/px	Psychology	diabetes/px
/ae	Adverse effect	Thalidomide/ae

► You want to get the answer of a very specific clinical question.

Ans: - You should construct a specific search by combining two or more broad searches. Suppose, if you want to search the articles about anorexia nervosa, you should follow the following steps:

Tick " Map text to subject heading".

You have not typed a field suffix (as.tw), so even if you forget to tick the box "Map text to subject

heading" the system automatically does this.

Try to match your request to one of its standard Medical Subject Heading (MeSH).

Wait few seconds, you can see the two options on screen.

The first is " anorexia nervosa" as a MeSH term and you are offered two additional choices: explode and focus.

You should ignore " explode box" now and consider the focus box".

Then you will get articles which are actually about anorexia nervosa and any article that mentioned anorexia nervosa in passing. You can search the specific clinical question by following ways too. You can search * anorexia nervosa/. In this search * shows that the term is a major focus of the article and / represents a MeSH term.

► **You don't know where to start searching.**

Ans: Use the "**Permuted Index Option**". Lets take the term " stress". It comes up a lot but searching for particular types of stress would be laborious and searching " stress" as a textword would be too unfocused. We need to know where in the MeSH index the various types of stress lie, and when we see that, we can choose the sort of stress we want to look at: for this, we use the command ptx (permuted index). If we type ptx stress, the screen shows many options, including posttraumatic stress disorders, stress fracture, oxidative stress, stress incontinence and so on.

Ptx is a useful command when the term you are exploring might be found in several subject areas. If your subject word is a discrete MeSH term, use the tree command, eg if you type tree epilepsy, this will show where epilepsy is placed in the MeSH index (as a branch of " brain diseases"), which itself branches into generalised epilepsy, partial epilepsy, posttraumatic epilepsy and so on.

► **Your search gives you lots of irrelevant articles.**

Ans:- Often, a search uncovers dozens of articles that are irrelevant to your question. The Boolean operator "NOT" can help here. This search (sinus not head \$.)tw gives you the articles, which are related to sinus only. We can search another way to get the relevant article is to narrow the textword search to adjacent words. Suppose you are searching " home help" includes two very common words linked in a specific context. Link them as follows: Home adj help.tw

If Medline hasn't helped, despite a thorough search, you should go through other medical and paramedical database. Medline does not cover furthermore, a number of important medical and paramedical journals at all.

► **The some important medical and paramedical databases are as given below:**

AIDSLIN database: - Reference the literature on AIDS and HIV back to 1980.

AMED database (www. silverplatter.com.): - Cover a range of complementary and alternative medicine including homeopathy, chiropractic, acupuncture and so on.

Bandolier (www.jr2.ox.ac.uk: 80/Bandolier): - Award-winning summary journal with searchable index produced by Andrew Moore and colleagues in Oxford, UK.

Cochrane database (www.mcmaster.ca/Cochrane/Cochrane/revabstr/abidx.htm)

Current Contents Search (www.ovid.gwdg.de/ovidweb/figuide/cc.htm # geni) Indexes journal on or before their publication date. Update weekly.

English National Board Health Care Database (www.enb.org.uk/hcd.htm): A database of journal references primary of interest to nurses, midwives and health visitors.

POPLINE database (www.popline.org): The world's largest bibliographic database on population, family planning, and related health issues, is also available in CD-ROM (free of charge to developing countries) and on the Internet, at no charge.

Photoshare searchable database (www.photoshare.org): Browse through thousands of health and development photographs categorised and indexed for easy searching.

SUMSearch (www.SUMSearch.uthscasa.edu): - A new method of searching the Internet for evidence based medical information.

Science Citation Index (www.wos.mimas.ac.uk): - Indexes the reference cited in articles as well as the usual author, title, abstract and citation of the articles themselves.

The ability to locate published data on a topic is a fundamental skill in the research process, and it aids in formulating and refining a research question and planning the study. Searching the literature for published studies on a topic relevant to one's question requires knowledge of databases such as MEDLINE, Cumulative Index to Nursing and Allied Health, or Hospital Literature Index.

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