

Tech Topic #5: Medical Information Searching Guide

(http://lrc.aiha.com/English/TOC_training.htm)

Purpose:

This Tech Topic has been written to reach two main audiences. First, it can be used as a guide to introduce health professionals to the information and communications opportunities that are available through the Internet. At the same time, it provides individuals who may already be familiar with the Internet with guidance on how and where to find information on-line. This document provides a comparative review of medical information resources and communication applications. This includes basic descriptions and instructions for a broad range of resources. An overview of informatics principles, an introduction to critical thinking about information, and a guide to integrating information from multiple sources are also included.

CONTENTS:

Background

I. INTRODUCTION

- 1.1 Types of Information
- 1.2 Grey Literature
- 1.3 Peer-reviewed Information
- 1.4 Electronic vs. Printed Information
- 1.5 General Informatics Concepts
 - 1.5.1 Boolean Logic
 - 1.5.2 Natural Language Searching
 - 1.5.3 Controlled Vocabularies vs. Free-Text Searching

II. RESOURCE MAPS

- 2.1 Consultation
- 2.2 Continuing Education
- 2.3 Professional Outreach
- 2.4 Clinical Questions
 - 2.4.1 General Reference
 - 2.4.2 Investigative Questions

III. WWW MEDICAL RESOURCES

- 3.1 Directories / Indices
- 3.2 Search Engines
- 3.3 Full text clinical resources
 - 3.3.1 Electronic Textbooks
 - 3.3.2 Electronic Journals
- 3.4 Distance Learning / CME

3.5 Clinical Specialties Web Sites

3.6 News

3.7 Conferences

3.8 Medical Equipment / Supplies

IV. OTHER INTERNET RESOURCES

4.1 Listservs and Mailing Lists

4.2 Chat / IRC

4.3 Blogs

V. SEARCHING ONLINE DATABASES

5.1 PubMed MEDLINE

5.1.1 Overview

5.1.2 MeSH

5.1.3 Access

VI. CD-ROMS

6.1 Introduction to CD-ROMs

6.1.1 General Installation Instructions

6.1.2 Security Issues

6.2 The Cochrane Library

VII. Summary, Additional Resources

BACKGROUND

Advances in electronic information technology have made a vast amount of information accessible quickly and cheaply. The global Internet has become the major conduit for this information. In a clinical situation, medical decision-making draws from acquired knowledge, experience, and data about a patient's condition. Additional information about treatment options, diagnosis, prognosis, etc. are essential to effective decision-making. The proliferation of electronic information has made this task more difficult in some ways. More information is not necessarily better. This Tech Topic is meant to simplify the task of finding quality, relevant, and reliable information.

Part I: INTRODUCTION

This section compares and classifies information resources and reviews basic informatics concepts

1.1 Types of Information

Information types can be classified by characteristics such as its source, its intended audience, and its medium. When choosing where to look for an answer to a clinical question, there are many variables to consider. For example, published medical literature is the best resource for peer-reviewed information,

but it is not updated as frequently as Web-based resources. Medical journals are also generally more research driven, and do not contain a large amount of basic instructional or procedural information.

1.2 Grey Literature

Grey literature is not readily available through normal book-selling channels, and is therefore difficult to identify and obtain. This type of literature is generally not included in conventional commercial databases such as Medline. Examples of grey literature include conference proceedings, theses, report literature, official publications, etc. Although grey literature is only sometimes published and peer-reviewed, it can still be very valuable information. Grey literature is an example of a valuable class of information that can be found on the Web.

Grey Literature From Michael Quinion's World Wide Words
(<http://www.worldwidewords.org/turnsofphrase/tp-grey1.htm>):

"The term **grey literature** refers to a wide range of types of informational material which is made available to the general public by public and private sector organizations whose function is not primarily publishing. Such information includes reports, brochures, guides, dissertations, product information, memoranda, budgetary data, and research findings. There have been at least two international conferences dealing with *grey literature* and the term is becoming established in information science."

1.3 Peer-Reviewed Information

The peer-review process is a quality control measure and an evaluation procedure applied to things such as publication of manuscripts, grant applications, and the review of clinical effectiveness. Peer-review strives to use objective expert opinion in analyzing such characteristics as bias, confidentiality, accuracy, study design, and scientific conduct. When a technical manuscript is submitted for publication, there is a lag time before it can be published while the manuscript is peer-reviewed. This process varies by journal, and can involve different levels of rigor. This objective expert analysis of the information is essential for reliability. When using information in a clinical situation, it is very important to seek out information that is peer-reviewed.

For a better explanation of the peer-review process, see [Tech Topic #10: Critical Assessment of Internet Medical Information](http://www.aiha.com/index.jsp?sid=1&id=7945&pid=5143) (<http://www.aiha.com/index.jsp?sid=1&id=7945&pid=5143>)

Other references:

- **Peer-review on trial**
<http://www.columbia.edu/cu/21stC/issue-1.1/peer.htm>
- **The Fifth International Congress on Peer Review and Biomedical Publication**
<http://www.ama-assn.org/public/peer/peerhome.htm>
- **For Science's Gatekeepers, a Credibility Gap.** By L.K. Altman. New York Times, May 2, 2006
<http://www.nytimes.com/2006/05/02/health/02docs.html>

1.4 Electronic vs. Printed Information

The growth of information technology has greatly impacted the speed and efficiency of information dissemination. Publishing electronically has many advantages over publishing on paper, but since it has not been in practice as long as printed publishing, it suffers disadvantages as well. The main disadvantage is the peer-review aspect mentioned above. Publishing is no longer limited to large professional societies or publishing houses that have an established, rigorous process of peer-review. Publishing electronically is now feasible even for the individual, which can lead to bias.

The increased efficiency of electronic publishing has increased the functionality of information as well as the quantity available. Electronically published information can include interactivity and multimedia, which are not possible in print. With documents on the web, publishers like the idea that they can correct typographic errors immediately, rather than waiting until the next issue to print errata in print journals.

Electronically published information also has the added advantage of being searchable like a database. This is true whether the information is published on CD-ROM, with a custom designed search engine, or if the material is published on the WWW, which can serve as a very large bibliographic database, once its searching capabilities are mastered.

1.5 General Informatics Principles

Most databases, including Internet search engines, follow the same principles that are easy to learn and can be applied to a broad number of applications.

To retrieve information from a database, you need to formulate your question in a way the computer will understand. This is called a "query." The database will use SQL, or Structured Query Language, which is the standard programming language used by database software, to interpret your query and return to you the results.

Queries are formed using simple concepts such as Boolean logic, by combining search terms using the operators such as *and*, *or*, and *not*. Symbols can be used to represent these terms, such as " ", "|", and "-". Proximity operators such as *near* are also commonly used.

The concepts presented in this section apply to a broad range of search systems, but each one has a measure of uniqueness. To ensure that your queries are formed properly, it is important to become familiar with the procedures for the system you use.

Go to:

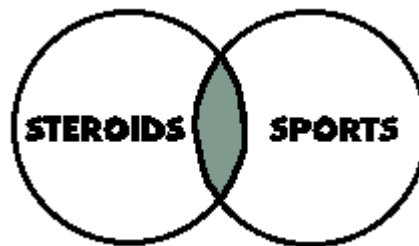
Section 3.2 - [Internet Search Engines](#)

1.5.1 Boolean Logic

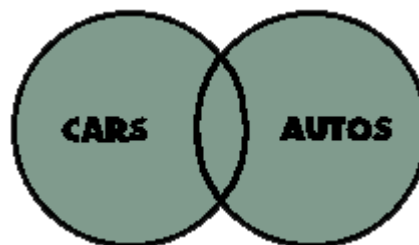
How to use Boolean Logic

What is Boolean Logic? It is the process of linking topics in order to narrow or expand a search through the use of the terms **AND**, **OR**, or **NOT**.

AND links two terms and narrows a search. For example, if you search for "Steroids and Sports," only articles containing both terms will be retrieved (as shown by the shaded area in the illustration below).



OR links two terms and expands a search. For example, if you search for "Cars or Autos," articles in which either term appears will be retrieved (as shown in the illustration below).



NOT narrows a search by excluding articles containing the second search term. For example, if you search for "Virus not AIDS," all articles in which "Virus" appears will be retrieved - except for those also containing the word "AIDS" (as shown in the illustration below).



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1.5.2 Natural Language Searching

In most cases, search engines for bibliographic databases are not "natural language" driven. This means that you cannot simply form a query as if you were asking a question - such as "Information about complications that arise after heart surgery." A better formulated query would be: "heart surgery or cardiovascular surgery and postoperative complications." Search queries are usually designed to use a "syntax" consisting of keywords and Boolean search terms. Often when you try to search with a natural language query, or when you attempt a search with command syntax the database does not recognize, you will cause a "syntax error."

In general, it is best to visualize the information you are looking for, and then tailor your query to match this image. Use search terms that are as specific as possible, to maximize the precision of your search results. Avoid ambiguous search terms.

1.5.3 Controlled Vocabularies vs. Free-Text Searching

Some databases use "controlled vocabularies" to eliminate ambiguity in search terms. The Medical Subject Headings (MESH) system is an example of a controlled vocabulary. Under this system, all information about a subject is indexed under the same standardized terminology. See the description of MESH Part V.

Free-text searching does not use a controlled vocabulary. Internet search engines use free-text searching, as do many CD-ROM based databases. When searching using free-text, it is important to search using all synonyms you can think of, and using truncation characters to make sure you catch the most relevant information.

For more information:

- **NoodleQuest – Search Strategy Wizard**
<http://www.noodletools.com/noodlequest/>
- **Introduction to Medical Informatics Online Lecture Notes**
Columbia University
<http://www.cpmc.columbia.edu/edu/textbook/>

Part II: RESOURCE MAPS

Guidance, direction, and instructions for searching for individual needs and situations.

2.1 Consultation

Consultation is the process of getting the opinion of another health professional or an expert about a specific problem or question. When you have a clinical question that you are having trouble answering, such as a patient that is showing symptoms inconsistent with your diagnosis, or a question about how to perform a surgical technique, consultation can be helpful. If the question you have is urgent, it is important to remember that the consultation route may take a long period of time to receive a response.

Consultation can take place within your hospital with other clinicians, or it can be accomplished across great distances using information technology. Detailed case reports can be sent through email along with scanned images of MRIs, X-Rays, etc. Where to look:

- [Mailing Lists / Listservs](#)
- [Chat](#)

2.2 Continuing Education

Medical science is continuous innovation. To ensure that they are giving their patients the most effective treatments developed by modern research, clinicians must continually keep abreast of new developments in their area of expertise. The amount of research literature that is produced can make this task daunting, but there are some Internet sites and commercial information products that simplify this process. Where to look:

- [Distance Learning / CME](#)
- [Medical News](#)
- [Conferences](#)
- [Electronic Journals](#)
- [Cochrane Library](#)

2.3 Professional Outreach

Cultivating relationships with other professionals in your field is important for both consultation and continuing education. It is also useful to help to get your own research published. There are a number of information resources that can help you get in touch with other health professionals and to keep a regular correspondence with them.

Where to look:

- [Listservs and Mailing Lists](#)
- [Chat](#)
- [Conferences](#)

2.4 Clinical Questions

2.4.1 General Reference

General reference questions are easy to answer if you have the right resource available. These questions generally have straightforward, unambiguous answers, and do not require the critical evaluation of a great deal of literature. Examples of general reference questions are: Indications and contraindications for drugs; Definitions of terms and acronyms; Interpretation of serological tests.

Where to look:

- [Online Electronic Textbooks](#)
- [Clinical Specialties Web Sites](#)

2.4.2 Investigative Questions

Most clinical questions, however, will not be simple to answer. They will also often require the review of several sources of information that can offer different or contradictory answers. The resources available to answer these questions can vary depending on the specialty, but there are some general principles that can be followed.

One of the most powerful research tools available for investigating clinical questions is the MEDLINE database. Medline can be accessed through a fee-based service such as Ovid or through any of a number of free MEDLINE sources. The MEDLINE database is continually updated with the latest research. With its controlled MESH vocabulary and meticulous indexing, MEDLINE can be an integral part of a systematic and thorough review of the clinical evidence.

Investigating a clinical question can be thought of as compiling evidence. Information that can be used to support a decision or course of action can be called evidence. Evidence-Based Practice is a growing movement that strives to integrate the results of current clinical research into clinical practice. When investigating a clinical question, it is best to follow a logical systematic process. This will help ensure that you effectively and efficiently retrieve all the relevant information. Here is an iterative search strategy:

1. Frame the question
2. Obtain the evidence
3. Assess the evidence
4. Apply the evidence

Framing the Question

The most important part of getting a useful answer is to ask a proper question. In this process, it is helpful to record everything you know about the situation you are asking about, including the patient's history, risk factors, etc. Formulate your question in natural language, framing your question in a category such as Diagnosis, Prognosis, Etiology, Therapy, etc. You will see in the Medline tutorial section that these categories are also useful search terms.

Obtaining the Evidence

Once you have framed the question, you are ready to develop your search strategy. At this stage, determine what information resources you will search, and formulate your search query. The "query" is the translation of your search question into statements that the database you search will understand, using command syntax and controlled vocabulary.

When conducting your search, pay careful attention to the source of the information that you find. Annotate your search results with its source, including bibliographic citation, URL, etc. It is useful for your search to be *reproducible*, so that you can go back and find the original source of the information that you obtain.

Assessing the Evidence

Not all information is equal. Even in the Medline databases, where everything in the database is published and has been peer-reviewed to some degree, it is important to critically evaluate and weigh the results that you retrieve.

Critical assessment of of medical literature is an involved process, and will be addressed in another Tech Topic: *Critical Assessment of Internet Medical Information (Tech Topic #10)*. You can do an in-depth analysis after the search is completed, but during the search itself, it is important to be mindful of basic parameters of information assessment.

These are basic some things to consider when you are assessing your search results:

How old is this study?

Has this study been published in a reputable journal?

Did this study have an adequate sample size?

Did this study have a good study design?

Applying the Evidence

Ensure that there has been a rigorous review of the sources for the evidence that you apply to the clinical question. Also ensure that the information applies to the patient under consideration, and that appropriate consideration has been paid to risk factors. Once you have determined a course of action, you may need to do followup searches for more details on surgical methods, novel pharmaceuticals, or other aspects of the treatment recommendation.

For more information:

- **Users' Guides to Evidence-Based Practice**
<http://www.cche.net/usersguides/main.asp>
- **Part VII: Summary, Additional Resources**

Part III: WORLD WIDE WEB RESOURCES

3.1 Directories / Indices

The vast amount of information available on the Internet is not useful unless you know how to find it. If you do not know where to look first, the best places to start are World Wide Web indices and directories, or web-sites that compile and categorize medical information. The electronic information resources indexed at these sites are often ranked for relevancy and rated.

- **HealthWeb**
<http://www.healthweb.org/>
- **OMNI**
<http://www.omni.ac.uk/>

3.2 Search Engines

If you cannot find the information you are looking for from one these directories, you can try a search engine of the entire Web. These search engines use keywords to search through their database of Web sites of all types all over the Web. In general, these search engines allow searching by keyword, without regard to context, and offer no controlled vocabulary. Effective searching strategies include using the Boolean operators. There are special search engines for retrieving medical and health care resources:

- **Med Hunt** - *<http://www.hon.ch/MedHunt/>*
- **Kosmix Health** - *http://www.kosmix.com/index_health.html*
- **BioMeta Cluster** - *<http://www.biometacluster.com/>*
- **OmniMedicalSearch.com** - *<http://www.omnimedicalsearch.com/>*
- **TRIP Database** – *<http://www.tripdatabase.com>*

3.3 Full-Text Information Resources

3.3.1 Electronic Textbooks

A growing number of medical textbooks are available online. These are valuable reference resources that should be bookmarked in your web browser. They often include a search engine that helps you search through the text more efficiently than a print version of the text.

- **Freebooks4doctors**
Includes more than 600 free medical textbooks in different languages
<http://www.freebooks4doctors.com>

3.3.2 Electronic Journals

There are a number of useful electronic publication sites that provide information about free electronic journals:

- **The Free Medical Journals Site**
<http://www.freemedicaljournals.com/>
- **Highwire press free online full-text articles**
<http://highwire.stanford.edu/lists/freart.dtl>

3.4 Distance Learning - CME

Nearly every major hospital now has a Web site and some will present their more difficult cases in their Grand Rounds section for other medical professionals to click and browse through.

The University of Utah's [WebPath: The Internet Pathology Laboratory](http://www-medlib.med.utah.edu/WebPath/webpath.html)

(<http://www-medlib.med.utah.edu/WebPath/webpath.html>) keeps a large collection of more than 1900 pathological images taken from autopsy examinations along with explanations of stages or progression and objective findings. Brigham and Women's Hospital in Boston, MA and numerous other radiology centers around the country keep a library of [radiographic teaching files](http://brighamrad.harvard.edu/education/online/tcd/tcd.html) (<http://brighamrad.harvard.edu/education/online/tcd/tcd.html>) of cases searchable by body part or imaging technique.

Clinicians of all medical fields can now obtain continuing medical education (CME) credits on-line. A growing number of professional institutions and associations have started offering CME modules on-line complete with examinations that can be e-mailed or otherwise returned electronically immediately after completion. Though many of the on-line CME modules are also available as mail-away packets, the on-line versions have an overall quicker turn around time and may be instantly scored. One organization that offers CME credits is the [National Institutes of Health](http://www.nih.gov) (NIH), who base their modules on their expert consensus statements developed for various subject areas. The NIH (<http://www.nih.gov>) develops its consensus statements through conferences attended by recognized panels of experts to improve clinical consistency in controversial practice areas. A sampling of their current on-line modules (you don't have to take the exam to read the modules) include topics such as optimal calcium intake, physical activity and cardiovascular health, and treatment of chronic pain.

CME credits are also available through commercial medical information companies such as MedScape (<http://www.medscape.com>). MedScape offers CME based on a selection of their collection of full-text peer reviewed clinical medicine articles in addition to module based exams.

3.5 Clinical Specialties Web Sites

Several web-sites offer specialized compilations of information that include a wide variety of information. These sites contain information such as grey literature, lists of relevant URLs, research news, etc. Clinical specialty sites are great ways to answer clinical questions and to keep up-to-date in your field.

One good example is "[Neonatology on the Web](http://www.neonatology.org)" (<http://www.neonatology.org>) from Cedars-Sinai Medical Center, an excellent comprehensive site of neonatology information on the Internet from Cedars-Sinai Medical Center. The site is frequently updated and tracks new web resources as they become available. A mailing list can be joined to keep informed of updates. Features also include a broad selection of neonatology teaching files, online clinical reference materials, and a guide to neonatal drug medications. Another example is the "[All the Virology on the WWW](http://www.tulane.edu/~dmsander/garryfavweb.html)" site – it contains current news, online course material, and links to information about every aspect of virology (<http://www.tulane.edu/~dmsander/garryfavweb.html>).

3.6 News

Taking advantage of the web's ability to remain updated, several sites offer current news about health care policy and research. The best source for current health and medical related news are [Reuter's Health Information Services](http://www.reutershealth.com) (<http://www.reutershealth.com>) and [Doctor's Guide to medical and other news](http://www.docguide.com/) (<http://www.docguide.com/>).

3.7 Conferences

The Internet is also useful for information about upcoming conferences. Conference organizers often post conference agendas, proceedings, abstracts, and registration forms online. There is also a move toward conducting conferences online.

- **The Congress Resource Centre (CRC)**

<http://www.docguide.com/crc.nsf/web-bySpec?OpenForm>

- **PapersINVITED.com**

<http://www.papersinvited.com/>

3.8 Medical Equipment / Supplies

The web is a great place to find information about medical equipment and supplies. There are a variety of web sites that offer product specifications, prices, and contact information for purchases. Also available online are descriptions of software, CD-ROMs and other information resources, including reviews and recommendations.

- **Buyer's Index Listings for: Health & Medical**

<http://www.buyersindex.com/brca/33.htm>

- **Medical Software**

<http://www.emedicalsoftware.info/>

You can also search Froogle (<http://froogle.google.com/?hl=en>) for any specific item or type of resources (CD-ROMs, books, software, etc.)

For more information:

- [Part VII: Summary, Additional Resources](#)

Part IV: OTHER INTERNET RESOURCES

4.1 Listservs and Mailing Lists

Listservs are automated mailing lists that you can subscribe to in order to join in an email discussion group on a particular topic. There are listservs on a variety of clinical specialties. Subscribers to these lists

include clinicians, researchers, and students involved in the topic area. Listservs are a good forum to ask clinical questions and solicit opinions. Each list has its own defined appropriate posting, which should be followed. Most lists are open to everyone, but many lists are moderated and only open to certain people. A good tool for joining and managing subscriptions to medical listservs can be found at *CataList* (<http://www.lsoft.com/lists/listref.html>)

AIHA maintains a number of mailing lists that are setup to facilitate communication between partnership program participants and other health professionals (<http://www.eurasiahealth.org/eng/misc/maillinglist/>).

- **EurasiaHealth**

A general dissemination and discussion list related to issues of health care in the former Soviet Union and in Central and Eastern Europe. It includes news about health issues and activities in the region and periodic updates about new resources available through EurasiaHealth and elsewhere. The EurasiaHealth Bulletin, Grants & Funding Bulletin, and Free Information Resources Bulletin are also distributed through the EurasiaHealth list.

- **EurasiaHealth-Rus**

A Russian-language discussion list with content similar to the EurasiaHealth list, including Russian versions of the EurasiaHealth Bulletin, Grants & Funding Bulletin, and Free Information Resources Bulletin.

- **EurasiaMedInfo**

Highlights information resources that are useful for health professionals working in the former Soviet Union and in Central and Eastern Europe. It is also a resource for health professionals from other countries working collaboratively with these regions, or who are interested in international health issues. Health Resources Digests are periodically distributed on this list. Each Digest includes information about Internet resources on health and medicine. In addition, the digests contain general information about the Internet and how to effectively use Internet tools. Both English and Russian text is transmitted on this list.

- **EurasiaTeleconsult**

A forum for the exchange of ideas about interesting or difficult clinical cases or questions. Subscribers can transmit case histories and clinical images and other data files, and present their questions to a broad audience of professionals.

4.2 Chat and Internet

There are some Internet applications that allow "real-time" direct communication between individuals. This is sometimes called "chat" and is can be done directly with two or more individuals, or with a groups of people from around the world, using IRC Internet Relay Chat. Chat facilitates direct, interactive communication between people. For a much more detailed description of this, see Tech Topic #1 - Internet Chat . The free Internet-phone application widely used today is Skype (<http://www.skype.com>)

4.3. Weblogs

Weblogs are frequently updated web pages with brief paragraphs of information, often structured as annotated resource lists in chronological order. They offer access to breaking news, evaluations, personal views, and other information that otherwise might not be readily available from traditional sources. While at a first glance a blog can appear a little more than a personal online diary, it has its own information value, and the weblog publishing tool is a basic content management software that can fulfill purposes well beyond the keeping of an online diary.

- **Family Medicine Notes**

This Weblog is devoted to news and views in family medicine
<http://www.docnotes.net/>

- **Medical Weblogs**

Medlogs is more than a list of medical Weblogs -- it's a Weblog aggregator.

For more information:

- [Part VII: Summary, Additional Resources](#)

Part V: SEARCHING ONLINE DATABASES

5.1 SEARCHING ONLINE DATABASES - PubMed MEDLINE

Even before the Internet was widely used, information "brokers" provided information to consumers on fee basis. In many cases these databases were accessed by dialing directly the host computer. Librarians at one time were restricted to searching VAX systems with 2400 baud modems to obtain up-to-date information. Today these fee-based services still operate, but many offer easy to use Web interfaces. The Internet now offers many sources of up-to-date medical/health care information for free, but fee-based services still remain important sources of some specialized information. PubMed MEDLINE is one of the leading sources of information about articles on medicine and health care that is available for free through the Internet.

5.1.1 Overview of MEDLINE

MEDLINE, produced by the United States National Library of Medicine, is the largest bibliographic medical database in the world. The database covers information in many different languages from as far back as 1950. MEDLINE includes more than 14 million records from more than 4,500 journals. Abstracts are included for about 67% of the records. The records also include links to full-text articles if they are available on the web (for free or for fee).

Very large databases like MEDLINE are not useful unless the information it contains is easily retrievable. Through the process of indexing, each record in a database can be made uniquely accessible based on its informational content. In the MEDLINE database, each record is indexed so that all the information about each document is itemized in a standardized fashion and made searchable.

The information in each record is divided into categories called fields. Fields contain a variety of different kinds of information about each record. When you are looking for records that meet certain criteria, it is important to search the database for information in the appropriate field. Fields are defined for each piece of information about a document. Examples of fields are: document author, journal name, article title, page number, journal volume, and abstract text.

5.1.2 Subject Headings

The most important of these fields is the Medical Subject Heading (MeSH). MeSH is a set of controlled terms that describe the substantive content of the article. For each article (or record) there are an average of ten to twelve terms assigned, arranged in a hierarchy, that summarizes the content of the article. MeSH also serves as a comprehensive, controlled medical vocabulary. Other information products have adopted this vocabulary to aid in searching their own databases. The Cochrane Library CD, for example, allows searching of its databases by MeSH term.

One advantage of searching using Medical Subject Headings is that all articles on a topic can be retrieved using a term even if the author didn't use that term or wrote the article in a different language. For example, an indexer will assign the index term "myocardial infarction" to an article discussing "heart attacks" even if the words "myocardial infarction" were never used in the article. Likewise, you need not worry whether an author used the term "heart attack," "heart attacks," or even "attack on the heart"--the indexer will have assigned the term "myocardial infarction" for all of these variations.

Keep in mind that new MeSH terms are created and added to the MEDLINE database system each year. If you search on a term that was added to the system in a particular year, you might not retrieve any citations before that year and you may have to determine other search terms to use for older articles. For instance, the term "tension headache" was not a Medical Subject Heading until 1995. For articles before 1995, you must search the term "headache."

There are over 14,000 Medical Subject Headings used by the NLM. Each is carefully defined, and each has a place in a hierarchy of medical terms known as a "tree." A tree is arranged with the broadest term at the top, followed by narrower (more specific) terms, until the bottom of the tree and the narrowest term is reached. The indexers always use the narrowest, most specific term possible, so there may be a greater number of articles indexed under a narrow term than under the broader term above it in the tree.

For example:

skin diseases (broadest term)

--dermatitis (narrower term)

----dermatitis, contact (narrower term)

-----dermatitis, occupational (narrowest term)

"Dermatitis" is narrower (more specific) than "skin diseases." "Dermatitis, contact" is narrower than "dermatitis," and so on.

There may be several trees that contain a term, each covering different topics. For instance, the term "eye" is in a tree under the term "face" and in another tree under the term "sense organs".

5.1.3 Where to Access MEDLINE

MEDLINE is accessible at a growing number of locations on the Internet, and many of them are free. There are many different search interfaces at these locations, but the database content and the basic searching principles are mostly the same. PubMed Medline (<http://www.pubmed.com>)

For a comparative listing of MEDLINE access sites, see

<http://hsc.utoledo.edu/lib/education/medlinecomp.pdf>

For more information:

- [Part VII: Summary, Additional Resources](#)

Part VI: CD-ROMs

6.1 Introduction to CD-ROMs

CD-ROM stands for Compact-Disc, Read-Only Memory. What this means is that CD-ROMs contain vast amounts of information on a small, portable disc. CD-ROM drives work much the same way as your computer's hard drive, except that it is "Read Only Memory" - information can only be read from it, not written to it. Generally, CD-ROM installation involves storing some program files on your local hard drive to access the CD-ROM.

CD-ROMs are static information resources - which means that they are not constantly updated. Online databases are a good place to look for current research, such as studies of new treatments or treatment efficacy, epidemiology, prognosis, etc. Online databases such as MEDLINE also contain things like editorials and literature reviews, and to some extent cover non-clinical information such as health management and administration.

6.1.1 General Installation Instructions

Installation of CD-ROMs is usually very simple. The process is the same as the installation of any new software program. The first step is to place the CD-ROM in the drive. Next, click on the Windows 95

start button, select Settings, and open the Control Panel. In Control Panel, double-click on Add/Remove Programs. On the Install/Uninstall tab, click Install. Windows will search the drives for the installation program, which will usually be called install.exe or setup.exe. Once Windows finds the installation file, click Finish, and you will be guided through an installation process.

When the program is done installing, program folders and icons will be installed on your computer. The next time you wish to run the CD-ROM, place it in the drive, and run the program icon from your computer.

6.1.2 CD-ROM Security

The high portability of CD-ROMs also poses a disadvantage - they can easily be stolen. Steps must be taken to ensure that they are kept secure.

Keep the CDs in a concealed, secure location. Do not leave CDs lying around in the open unattended. Do not leave CDs in the drive unattended. CDs should be removed from the drives and kept in a secure location overnight.

6.2 The Cochrane Library

Produced by the Cochrane Collaboration, the Cochrane Library CD provides rapid access to high quality information about the effects of health care. This CD is a tool for practicing Evidence-Based Medicine, and is best utilized with solid knowledge of these principles. The Cochrane Collaboration produces systematic reviews, which combine the results of multiple clinical studies, evaluate the validity of the studies and weight the results, for the purpose of producing integrated information for clinical decision making. For more information on this CD and Evidence-Based Medicine, see [Tech Topic #11 - Evidence Based Medicine](#). The main database on the CD is the Cochrane Database of Systematic Reviews (CDSR) - a full text database containing systematic reviews of mainly randomized controlled trials. The reviews are highly structured, and evidence is included or excluded on the basis of explicit quality criteria to minimize bias. When appropriate, meta-analysis is used to combine the findings of individual studies to provide an overall estimate of effectiveness. The reviews in CDSR are regularly updated as new information becomes available and in response to comments and criticism.

For more information:

- [Part VII: Summary, Additional Resources](#)

Part VII: SUMMARY, ADDITIONAL RESOURCES

SUMMARY

Electronic information technology has drastically increased the amount of information accessible with meager investment in computers and equipment. This has made the job of the medical librarian or information coordinator easier in some ways and more difficult in others. Information must be evaluated and assessed based on timeliness, source, and medium. Search strategies can also be assessed based on criteria such as completeness. Becoming familiar with all the concepts presented in this Tech Topic is essential for evaluating both your search results and your search strategy.

This Tech Topic has covered a very broad range of informatics concepts. For more detailed information on specific topics, please refer to the resources listed below:

Part I

- [TONIC - The Online Netskills Interactive Course](http://www.netskills.ac.uk/onlinecourses/tonic/)
http://www.netskills.ac.uk/onlinecourses/tonic/
- [Introduction to Medical Informatics Online Lecture Notes](http://www.cpmc.columbia.edu/edu/textbook/)
Columbia University
http://www.cpmc.columbia.edu/edu/textbook/

Part II-IV

- Users' Guides to Evidence-Based Practice
<http://www.cche.net/usersguides/main.asp>
- Three Basic "Families" or Types of Search Tools
<http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/ToolsTables.html>
- Grey Literature Report
<http://www.nyam.org/library/grey.shtml>
- Medical/Health Information Directories and Portals
<http://lrc.aiha.com/English/Training/HRD-Oct03-Eng.pdf>
- Finding Conference Papers and Reports on the Web
<http://lrc.aiha.com/English/Training/HRD-Jul03-Eng.pdf>
- A Guide to Electronic Libraries
<http://lrc.aiha.com/English/Training/LibGuide-Eng.pdf>
- An inventory of resources that use Cochrane reviews
<http://lrc.aiha.com/English/Training/Cochrane-Inventory-Eng.pdf>

Part V

- PubMed Online Training
<http://www.nlm.nih.gov/bsd/disted/pubmed.html>
- NLM Training Manuals and Resources
http://www.nlm.nih.gov/pubs/web_based.html

Part VI

- The Cochrane Library
<http://www.thecochranelibrary.com/>
- The Cochrane Collaboration
<http://www.cochrane.org/>
- STAT!Ref
<http://www.statref.com/>
- Medbookstore
<http://www.medbookstore.com>

Other Relevant Tech Topics:

Tech Topic #1: Internet Chat

A three part review of interactive "real-time" communication on the Internet including information about: WinTalk, Internet Relay Chat and other Chat software.

<http://www.aiha.com/index.jsp?sid=1&id=5144&pid=5143>

Tech Topic #10: Critical Assessment of Internet Medical Information

A guide to assessing the quality of medical information found online, including a general overview of the peer-review process.

<http://www.aiha.com/index.jsp?sid=1&id=7945&pid=5143>

Tech Topic #11: Evidence-Based Medicine

A review of broad concepts of evidence-based medicine, with specific examples of applications of its principles in the LRCs.

<http://www.aiha.com/index.jsp?sid=1&id=7946&pid=5143>

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