Basics of Finding and Evaluating Medical and Health Information on the Internet

by

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ABSTRACT

With the increase in the accessibility of Internet connections for the public, there is more and more opportunity for consumers to take advantage of vast amounts of health and medical information. The purpose of this article is to provide those consumers with some of the basics needed in finding the quality health and medical information and distinguishing it from the mediocre and the trash. Basic Internet terminology and some basic searching techniques helpful for information retrieval are provided. Included are the five major criteria for evaluation and suggested questions for use in this process. Interpreting the various segments of the URL is also covered, along with examples of common Internet domains. Some Internet sites and their URLs are provided as starting points, as tutorials and for more exploration and study of the topics considered in the article.

INTRODUCTION

The amount of medical and health information on the Internet continues to grow. Some of it is good, useful and of benefit. But there is also a vast amount that can be considered bad, biased, useless and perhaps even dangerous. Among users in general, there are any number of misconceptions with respect to what the Internet offers. One often hears "Everything is on the Internet." - "Books are extinct." - "Everything on the Internet is free." - "The best place to look is the Internet." - "The latest information is on the Internet." - "The best information is on the Internet."

Is any of this true? Although there is a vast amount of information out there, everything is not on the Internet and what is there is not always free. Making published books available on the Internet is a very expensive undertaking. In the future, newly published books may very well be available only on the Internet. But, look for new pricing schemes that will assure that revenue from book sales will be equaled if not surpassed. Until that time, books will still be around. Magazine, newspaper and journal articles can be found on the Internet, but in most cases, this still involves a subscription cost either personally or through a larger entity such as a library.

Is the latest information there? Certainly the Internet makes it possible to supply information as quickly as it is compiled, but this does not guarantee that superseded information is removed. In the medical field the newest developments and research findings generally appear in the journal literature. These journals may not be on the Internet and, as already mentioned, if they are they may not be free. Is it really the best place to look? For those with little computer or Internet experience, traditional print sources may work better. At times, locating information in a known print source may be faster and easier than searching the Internet.

What about the best information, is the Internet the right place to look? The fact is that anyone can publish on the Net and although standards have been suggested, there is no means of enforcing any set of criteria for every site or individual publishing on the Internet. (1,2,3) The reality is that a great deal of the

information will never have to pass through any standard examination before being included. So yes, some of the best information might be there but there is also a lot of misinformation included.

Is it a good source for health and medical information?   It certainly makes more information available to more people than ever before. The Internet is especially good for finding material provided by government agencies such as the National Institutes of Health (http://www.nih.gov), the Centers for Disease Control (http://www.cdc.gov) and the Health Resources and Services Administration (http://wwwhrsa.dhhs.gov)(http://www.hrsa.dhhs.gov)to to name a few. Usenet newsgroups and electronic discussion lists can be helpful in locating experts and consultants on specific topics. Statistical sources, dictionaries, encyclopedias and other ready reference sources can be found on the Internet to answer basic questions. The Net does, moreover, provide new opportunities to improve decisions and communication for both professionals and consumers.

INTERNET SEARCHING

Since finding quality information is a major concern when searching in the area of health and medicine, one may ask if there is any effective way to go about doing this. No matter what the subject matter, having some understanding of basic Internet terminology and navigational or "surfing" techniques will be helpful. There are many books available on how to search the Internet, but examples and practice exercises in these books quickly become outdated. Taking advantage of Internet training opportunities is highly recommended. Many public and academic libraries have these available at no cost to their users. The most effective method of Internet training is the one that provides the opportunity for participants to sit at computers and actually have "hands-on" experience. There are also tutorials available on the Internet, some are free but others may charge a fee.

For those who are just beginning here are some common terms that will be encountered.

      <u>Browser</u> - A browser is a software package that allows a user to view Web pages and search the Web. Examples are Netscape and Internet Explorer.

Home Page - This is the entry point to a site's set of Web pages. It generally includes a table of contents or directions for finding information at that site.

Hyperlinks - More commonly referred to as links, these are specially highlighted text or images that point and take the user to other documents within the site or to other sites on the Web.

Hypertext - This is a way of organizing information so that words in the text can be linked to more information. These links may be to additional text, pictures, video or sound.

HTTP - This stands for Hypertext Transfer Protocol. This is a standard that allows computers to understand each other when sending or moving hypertext files over the World Wide Web.

HTML - This stands for Hypertext Markup Language. It is the language used in creating hypertext documents for the World Wide Web.

Internet - This is not the same thing as the World Wide Web. It is a network of networks or a worldwide network of computers.

LYNX - A text-based World Wide Web browser. Useful for those without full Internet connections to search and retrieve text resources (no sound or graphics) from the World Wide Web.

URL - This stands for Uniform Resource Locator. These are unique addresses and identifiers for the resources available on the Internet.

World Wide Web - A large collection of information accessible through the Internet using hyperlinks.

One of the main problems with searching the Internet is that it lacks organization and very often too much information is retrieved. Tens of thousands and perhaps even hundreds of thousands of results are overwhelming. For health and medical information, there are some starting points that can make the process a little easier. These sites are the result of the efforts of experts, librarians or professionals in the field to organize, review and sometimes annotate quality sites. Some examples are:

Hardin Meta Directory of Internet Health Sources -

http://www.lib.uiowa.edu/hardin/md/index.html

HealthAtoZ - http://www.healthAtoZ.com

Healthfinder - http://www.healthfinder.org

HealthWeb - http://healthweb.org

HealthWorld Online - http://www.healthy.net

Martindale's Health Science Guide - http://www-sci.lib.uci.edu/HSG/HSGuide.html

Medical Matrix - http://www.medmatrix.org

Mediconsult - http://www.mediconsult.com

Medscape - http://medscape.com

MedWeb plus - http://www.medwebplus.com

Medical professional organizations and academic sites are also good as starting points.

Information can, of course, be located using Internet search tools; Web indexes, search engines and meta-search engines. The Web index or subject directory can be described as a collection of sites that have been examined and categorized or been assigned subject headings. Generally, the initial page will be arranged by broad subject headings. Once a subject area is chosen, the material will be narrowed into more specific topics. Each succeeding choice will result in more and more focused subject headings. These indexes will also offer the user a search box in which to type a topic and will execute a search of their whole site or any part of the site designated by the user. The best known of these directories is Yahoo (http://www.yahoo.com). Another is the WWW Virtual Library (http://vlib.stanford.edu/Overview.html).

Perhaps the most frequently used tool is the Web search engine. Search engines are huge collections of sites on any imaginable topic with a search capability. A keyword, phrase or question is typed in the search box. The search service responds by giving a list of all the Web pages in the index corresponding to the terms entered. In most cases the most relevant content will appear at the top of the results. Search engines vary in how much of the Web they index. They also vary in search capabilities and in search strategies. Some of the major search engines are:

Altavista - http://www.altavista.digital.com

Excite - http://www.excite.com

Hotbot - http://www.hotbot.com/index.html

Lycos - http://lycoc.com

WebCrawler - http://webcrawler.com

Because of the numbers of different search engines available, meta-search engines were developed. These provide a search of more than one search engine or directory at the same time using a single search expression. Speed and accuracy can be a problem with these but they are good for unique or specialized searches. Some examples are:

Metacrawler - http://www.go2net.com/search.html

SavvySearch - http://www.savvysearch.com

DogPile - http://www.dogpile.com

With any of these services, it is a good idea to look at the help screens or search strategy sections offered. Overall, there are some basic strategies that will help retrieve meaningful results. Enter unique words and phrases and avoid general terms. Capitalize if the term is most likely to be found that way in a document. "AIDS" as a search term will produce fewer and more relevant results on the disease than entering "aids." With most search engines, phrases should be entered between quotation marks. In order to specify that a word must be in the result list, a plus (+) sign can be entered directly before the word. Entering a minus (-) sign before a word will exclude it from the search. In order to perform a thorough search, several search engines should be used.

Search engines and meta-search engines are constantly changing their features in order to improve results. This means that documentation provided should be checked before searching. The way it worked yesterday isn't necessarily the way it will work today. The following are examples of sites that offer tutorials on how to use Internet search tools and updates on new features and improvements.

Search Engine Watch - http://searchenginewatch.com

Understanding and Comparing Search Engines -

http://www.hamline.edu/library/bush/handouts/comparisons.html

Understanding WWW Search Tools - http://www.indiana.edu/~librcsd/search/

Web Search Tool Features - www.unn.ac.uk/features.htm

EVALUATING INFORMATION

Once information has been located, it is most important that an evaluation of the results takes place. As mentioned earlier, anyone can put information on the Internet. Two recently published studies, one by Impicciatore et al. and the other by McClung et al. reveal that only a few of the web pages reviewed in their studies gave complete and accurate information on such common conditions as fever and diarrhea in children. (4, 5) Most disconcerting was the fact that the McClung study found that even if the source was a major academic medical center the likelihood of compliance with accepted standards of treatment did not improve. (5)

It has become just about standard to evaluate the quality of a site on the basis of five criteria; authority, accuracy, objectivity, currency and coverage. These are not very different from criteria used to evaluate other information sources. Authority is a major criterion in the evaluation process. Questions that need to be asked when considering the source are:

1. Who is the creator or author?

2. Are the authors qualifications listed or available through a link?

3. Can the creator be contacted?

4. Is the site affiliated with a national or international organization?

Web site ownership should be prominently displayed as well as information regarding the authorship of material found at the site. Reliable sites will not have a problem including sections where more information about the sponsor, webmaster and mission of the site can be obtained. These features are especially useful when viewing commercial sites.

Examining the URL can also give some valuable clues as to the origin of the information, such as, who sponsors the page, where it is located and where it is located on that machine. The different segments of the URL all represent something. For example:

http://www.fau.edu/library/faulibs.htm

The **http:** (Hypertext Transfer Protocol) signifies that this is a World Wide Web site. Others that might be encountered are **gopher:**, **news:** and **ftp:** (filer transfer protocol). The **www** stands for World Wide Web and may or may not be a part of the URL. The **fau** represents the name of the organization, Florida Atlantic University. The **edu** represents the domain, in this case, an educational institution. The segment before the single slash represents the home page of the organization and anything following a slash represents a directory or secondary page on the site. Domain extensions can be very helpful in determining what type of organization has created the page and what the agenda of the page might be. Commonly found domains are: .com - commercial organization; .edu - educational institution; .gov – government;

.int - international organization; .mil – military; .net - networking organization; .org - nonprofit organization.

There are also geographical domains that are used to denote the country where the site originates. Some common examples are: .ca –Canada; .uk - United Kingdom; .au – Australia; .pr - Puerto Rico; .il – Israel.

The purpose of testing for accuracy is to assure that the information presented is actually correct. Questions to ask are:

1. Is the purpose of the document stated?
2. Is the factual information exact?
3. Is the information complete?
4. Is there a list of publications used as resources?

Material from several sources should be compared. Conflicting information needs to be examined carefully and discussed with a health professional.

Information is rarely neutral and when looking at the Internet it is important to determine if there is any personal or organizational point of view being presented. Determining the source or author is one part of the process in judging objectivity. Other questions to consider are:

1. Is the material factual or is it opinion?

2. Is the content separate from advertising?

3. Is advertising or opinion identified as such?

4. Who is the intended audience?

Sponsorship, especially financial support, for a site should be disclosed to allow individuals to ascertain whether any conflict of interest might exist.

Currency is extremely important in the health and medical information field where information can become outdated very quickly. To determine currency ask:

1. When was the site produced?

2. When was it last updated?

3. Is any content out-of-date?

4. Are any links outdated?

If timeliness cannot be determined, the material should be viewed with suspicion.

The coverage or scope of information refers to the depth or level at which the material is presented.
Some questions to pose are:

1. Is the site comprehensive?

2. If links are provided, are they comprehensive or only a sampling?

3. Is the information complete, or is it edited or embellished in any way?

4. Is the information superficial, basic or in-depth?

5. Who is the intended audience? Children, adolescents, adults, laymen, professionals?

6. How does it compare to other sources?

Good sites will be complete and accurate and important facts will not be left out. More than one source should be consulted before coming to a conclusion.

Jim Kapoun provides a chart in his article, "Teaching Undergrads Web Evaluation" that can easily be used as a model or checklist for evaluating Internet information. (6) Additional points to consider when judging a specialized site can be found in Esther Grassian's "Thinking Critically about Disciplined-Based World Wide Web Resources" (http://www.library.ucla.edu/libraries/college/instruct/web/discp.htm).   The best strategy is to use common sense and a questioning mind and, most important of all, consult with the experts.

MAILING LISTS AND NEWSGROUPS

One of the wonderful things about the Internet is that it affords a forum for communicating directly with people to share experiences and information on topics of mutual interest. This can be especially valuable for individuals needing support who are geographically remote or are seeking information on lesser known diseases or conditions. This type of communication generally takes place on mailing lists or within newsgroups. Mailing lists or electronic discussion groups are generally referred to as listservs. Anyone on the Internet with electronic mail can subscribe. Messages are distributed to everyone on the list and one can join or leave at any time. A few sites to consult when looking for a relevant discussion list are: Liszt, the mailing list directory (http://www.liszt.com); Tile.net Lists (http://tile.net/lists); CataList (http://www.lsoft.com/lists/listref.html).

The other popular forum for exchanging information on the Internet is Usenet newsgroups. Although used for the same reasons as a discussion list, newsgroups differ in several ways. Usenet is very large and access to many groups is available. Messages are not distributed through e-mail but rather passed from one computer system to another. Newsreader software is used to read the articles or news items that are located on a computer, usually operated by Internet provider services. "Usenet: Reading and Writing the News" (http://www.mwc.edu/ernie/Lrn-web05.html) by Ernest Ackermann is a good site for learning more about newsgroups. CyberFiber Newsgroups (http://www.cyberfiber.com/index.html) is a directory of

newsgroups arranged by subject headings. Another helpful site that is both a directory and source of the essential details on Usenet is the Usenet Info Center Launch Pad (http://metalab.unc.edu/usenet-i/home.html). A directory of health related newsgroups can be found at (http://www.moh.govt.nz/news1.htm).

Both listservs and newsgroups provide powerful forums for the exchange of ideas and information, but they may (Usenet newsgroups especially) carry inaccurate, harmful and sometimes offensive material. These sources can be considered as "word of mouth" and one should be particularly cautious. Health practitioners sometimes moderate or participate in these communications, but beware of anyone attempting to diagnose or treat online.

UNDERSTAND THE MEDICAL LITERATURE

Being well informed and participating in the management of health and medical care is extremely important in today's managed care environment. Having access to the medical literature is now much easier because of the Internet. The National Library of Medicine provides free access to Medline through PubMed (http://www.ncbi.nlm.nih.gov/PubMed/). This database of medical and scientific journal citations is available to anyone with a computer and an Internet connection. The literature indexed in Medline is primarily meant for practitioners or researchers in the biomedical field. The layperson should be prepared to encounter terminology and subject matter that may be difficult to understand and that is best discussed and considered with their health care provider.

Some background information about medical literature is helpful before beginning a search of Medline as pointed out in a recent article from the Newsletter-People's Medical Society. (7) To summarize, two basic types of articles dominate the medical literature, the research article and the review article. Almost all will include an abstract or summary at the beginning. These can include some very useful information but should only be used as a means of determining whether or not to read the complete article. When using Pubmed, once articles of interest have been identified, thefull text can be ordered at a cost.

Research articles will report the results of original research both basic and applied. Basic research deals with experimental work or methods that expand a field of science or medicine and may have beneficial applications in the future. Applied research examines methods, practices, treatments or issues that directly affect patients, diseases or conditions. The typical arrangement for the research articles is that it begins with an introduction, followed by a description of the study methods and findings. In some cases, major points will be summarized in a conclusion.

The review article will survey and report on the current literature that has already been published on a specific topic. It may evaluate only a few articles, but generally covers dozens or even hundreds. It is not original research but is useful for a broad overview of research on a topic. More than one review article on a topic should be consulted since authors of these may have a particular idea or bias they wish to convey.

Because medical journals submit articles to a review process by experts before publishing, they can generally be relied on as valid sources. But there have been instances where shoddy research has been reported or research results have been falsified. New and conflicting studies are constantly being announced in the literature and by the media and this can cause confusion. The information needs to be shared and discussed with qualified health care providers before changes are made to care and treatment plans.

CONCLUSION

The value of the Internet as a resource of health and medical information is powerful. More people have more access to a huge collection of material from all over the world and more people rely on it as a primary source. But the public nature of the Internet means that anyone (experts, health organizations, governments, and charlatans) can put information out there. Familiarity with navigating the Internet and with how to evaluate the material retrieved is a valuable skill to possess when trying to wade through the

disorder for the quality information. Information found on the Internet, as with information found in

traditional sources, should not replace the health care professional. It will, however, provide a good basis

for discussion when determining treatment and care. For those willing to invest a modest amount of time

and energy, there are vast amounts of reliable information available.

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Vaccine Basics. Evaluating Online Health Information. Questions You Should Ask. • Who manages this information? The person or group that has published health information online should be identified on the website. If the information was originally published in another source such as a research journal or a book, it should be identified so you can find the original source. • How is information reviewed before it gets posted? Most health information publications have someone with medical or research credentials (e.g., someone who has earned an MD, DO, or PhD) review the information before it gets posted, to make sure it is correct. This information should be noted on the website. • How current is the information? Health information can be extremely useful, empowering us to make important medical decisions, but it also can be confusing or overwhelming. Learn more. Ideally, information in a journal or on the Web should have an identifiable source or an author. In considering the credibility of the source, ask yourself whether the particular source you are reading is likely to be fair, objective and lacking in hidden motives. Take care to examine the credentials of the source to determine whether the author or organization has the required expertise and training to provide the information. If the information is medical, credibility is generally enhanced if it is provided by a medical institution, an entity that brings together medically knowledgeable prof Health information on the Internet refers to all health-related information communicated through or available on the Internet. The Internet is widely used by the general public as a tool for finding health information. In the late 1990s, researchers noted an increase in Internet users' access to health-related content despite the variation in the quality of information, level of accessibility, and overall health literacy. Access to health information does not guarantee understanding, as health "from medical authorities EVALUATE! EVALUATE! Other Resources. • Libraries: See the Alabama Public Library Service (APLS) public library directory at http://aplsnew-web.apls.state.al.us/libinfo/ or call them at 1-800-723-8459. Documents Similar To Finding Health Information on the Internet. Carousel Previous Carousel Next.