

Finding health information on the Internet: health professionals

Robert Kiley

This article discusses some of the key problems that clinicians encounter when searching the Internet for health information. Guidance is provided on how best to search the Internet to find high-quality information and resources. The Internet is a dynamic and valuable source of information for health professionals, but information accessed through the Internet should be critically evaluated before being applied to practice.

INTRODUCTION

Information is one commodity health professionals are not short of. Official guidelines, executive letters and circulars, as well as information from professional bodies and numerous patient groups fill the clinicians' in-box with alarming regularity. In addition, there is the need to keep abreast of the research literature. In an average year around 400 000 new citations are added to the Medline database. In the words of Muir Gray (1998) 'busy clinicians are now caught in an information paradox — overwhelmed with information but unable to find the knowledge they need when they need it'.

This sense of information overload has been further exacerbated in recent years with the rise of the Internet. A survey conducted by the NEC Research Institute (2000) in January 2000 calculated that the indexable web — those pages that can be identified and indexed by search engines — consisted of approximately 1 billion pages, while growth was estimated to be in the order of 20 million pages a month. Precisely how many of these pages are relevant to health professionals is impossible to say, but a number of authors (Eysenbach et al, 1999; Kiley, 1999) have speculated that there are approximately 100 000 sites on the web that provide health information and services.

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health information are discussed and guidance is offered on how best to search the Internet to find high-quality information and resources.

KEY PROBLEMS

A search for 'arthritis' on the popular search engine AltaVista <http://www.altavista.com> neatly illustrates the key problems clinicians experience when searching the Internet: too many web pages are found (this search identified over 725 000 pages), and the quality of the sites that you are directed to are highly variable. The results from the AltaVista search direct Internet users to two similar sounding sites but with vastly contrasting information.

The Cure Arthritis website <http://www.curearthritis.org> is the official site of the Arthritis National Research Foundation and provides information about ongoing research into the prevention and treatment of arthritis. In contrast, the Cure Arthritis — Stop Pain Now website <http://www.cure-arthritis.com> promotes a 'cure' for arthritis that is 'fast, easy, safe, effective, natural and permanent' (Since this article was written this site is no longer accessible. However, numerous other sites are still selling miracle cures for arthritis such as 'The CMO solution for arthritis' at: <http://www.arthritis.net/cmo.htm>.)

Although identifying which is the more credible source is not particularly demanding, time and effort may nevertheless have been expended in accessing this type of website. In addition, the clinician may have to spend

further time explaining to patients that the 'CMO solution' offered by the [cure-arthritis.com](http://www.cure-arthritis.com) site is nothing other than a food supplement and is unlikely to have any effect on the patient's arthritic condition.

Consequently, to minimize the time spent surfing sites such as these a different approach to searching is required. A hierarchical approach using four different levels is outlined.

LEVEL 1: BIBLIOGRAPHIC DATABASES

Perhaps the best place to start any search for health information is on the traditional bibliographic databases, such as Medline, newer evidence-based sources such as the Cochrane Library, and databases that have been developed by the NHS Centre for Reviews and Dissemination.

These databases are available in formats other than the web (CD-ROM and paper, for example), but their migration to the web in recent years means that they can now be accessed through the standard web browser. Consequently, clinicians no longer have to learn how individual software applications work, or bother about installing software and regular database updates. The sources identified below are available free of charge.

Medline

<http://www.ncbi.nlm.nih.gov/pubmed>
Developed by the US National Library of Medicine, Medline provides users with access to more than 10 million citations, indexed from over 4 000 biomedical journals published in more

Mr Robert Kiley is Information Service Manager, Wellcome Library for the History and Understanding of Medicine, Wellcome Trust, London NW1 2BE

than 70 countries. The current version of PubMed contains dynamic links to related databases, such as OMIM (Online Mendelian Inheritance in Man) and protein sequences, as well as direct links to full-text articles hosted on various publisher websites. As of July 2000, 936 full-text online journals are linked to PubMed. Help on how to search this database can be found at: <http://www.wellcome.ac.uk/en/1/homlibinfecthiarc15mdl.html>

Cochrane Database of Systematic Reviews

<http://www.update-software.com/cochrane/cochrane-frame.html>

The Cochrane Database of Systematic Reviews is a collection of structured and systematic reviews on the effects of health care. In the main, Cochrane reviews are based on reviews of randomized controlled trials (RCTs). Where possible, results from individual RCTs are combined statistically, with meta-analysis, to increase the power of the findings of numerous studies each too small to produce reliable results individually.

The abstracts of these reviews — which include the background to the review, search strategy, main results and conclusions — are available free of charge. If you wish to access the full-text of each review the cost for 12 months' access to this product is £120.00. Further details can be found at: <http://www.update-software.com/cochrane/orderform-cochrane.html>

NHS Centre for Reviews and Dissemination

<http://agatha.york.ac.uk/welcome.htm>

The NHS Centre for Reviews and Dissemination was established to identify and review the results of good-quality health research and to actively disseminate the findings to key decision makers in the NHS. Two databases have been developed to help realize this objective: DARE (Database of Abstracts of Reviews of Effectiveness) is a database of high-quality systematic research reviews of the effectiveness of health-care interventions; NEED (NHS Economic Evaluation Database) is a database of

structured abstracts on economic evaluations of health-care interventions.

TRIP

<http://www.ceres.uwcm.ac.uk/>

TRIP (Turning Research into Practice) is an amalgamation of 26 databases of hyperlinks from 'evidence-based' sites around the world. At present there are over 10 000 links to evidence-based topics. Sources for this database include publications such as *Bandolier*, and *Effective Healthcare Bulletins*, as well as database services such as National Guideline Clearinghouse and POEM (Patient-Oriented Evidence that Matters).

Other databases

Other useful bibliographic databases available on the web without charge, include BioethicsLine <http://bioethics.georgetown.edu/bioline.htm> (useful for identifying research that examines the ethical implications of biomedical research), HealthStar <http://igm.nlm.nih.gov/> (a health management database) and CancerLit <http://cnetdb.nci.nih.gov/cancerlit.shtml> developed by the National Cancer Institute.

LEVEL 2: EVALUATED SUBJECT GATEWAYS

Research from Media Metrix (2000) shows that search engines are the most trafficked sites on the Internet. Figures for March 2000 on the top 5 sites — in terms of visitors — were all search sites, such as Yahoo!, Excite and Lycos. As discussed above, however, these tools typically identify too many sites, none of which have been assessed for quality. Sorting the wheat from the chaff is left to the individual searcher.

To mitigate this problem evaluated Internet subject gateways, rather than the generic search engines, should be used to identify high-quality health resources on the web. Only those Internet resources that meet a defined quality threshold are indexed in these gateway services. Three of the most useful health gateways — OMNI (Organising Medical Networked Information), Medical Matrix and Netting the Evidence — are discussed.

OMNI

<http://omni.ac.uk/>

Describing itself as the UK's gateway to high-quality biomedical Internet resources, OMNI provides descriptions and links to around 5000 health websites. In contrast to the 725 000 sites identified at AltaVista, an OMNI search for arthritis points the user to just 41 websites. All sites that are indexed by OMNI meet the quality criterion as published at: <http://omni.ac.uk/agec/evalguid.html>

Medical Matrix

<http://www.medmatrix.org/>

Aimed primarily at American physicians, resources included in this database are ranked according to their utility for point-of-care clinical application. As with OMNI, there are around 5 000 resources described in the Matrix, all of which are organized within a simple subject-based hierarchical structure.

Netting the Evidence

<http://www.shef.ac.uk/uni/academic/r-z.scharr/ir.netting.html>

Compiled by Andrew Booth from the School of Health and Related Research (ScHARR), Netting the Evidence is a comprehensive, annotated guide to evidence-based health-care resources on the Internet.

LEVEL 3: GENERAL SEARCH TOOLS

Because the evaluated subject gateway services are compiled manually — individuals have to visit sites, check that they meet the relevant quality criteria, and write a brief description of that service — the number of resources they point to is relatively small. Inevitably, therefore, there are times when a broader search is required. The two services described here — Google and Northern Light — can help the clinician conduct an effective Internet search.

Finding a website of a known organization — Google

<http://www.google.com>

A cursory examination of the MetaCrawler MetaSpy site

<http://www.metaspynet.com/> (which shows in real-time what searches are currently being conducted on the MetaCrawler search site) highlights the fact that search engines are often used to identify the website of a known organization. When faced with this problem, the Google search engine is without doubt the most effective tool currently available.

Unlike other search engines, Google returns a list of search results where the ranking is based on how other sites link to that site. And, as most hypertext links on the web point to home pages — rather than to some specific page buried deep within the site — Google searches invariably identify first the home page of any organization. The Google developers are so confident of their search software that they invite users to select the ‘I’m feeling lucky’ button after a search term has been entered. On selecting this, users bypass the traditional search results page and instead are taken directly to the site that Google ranks as being the most relevant to that search.

Power searching — Northern Light

<http://www.northernlight.com>

Using the ‘Power Search’ option at Northern Light, it is possible to conduct a highly-focused search that identifies a small number of highly-relevant sites. For example, if you were trying to find data on waiting times, a search could be constructed that only

finds those sites where the word ‘waiting’ appears in the title of the page, and where the domain is either ‘.nhs.uk’ or ‘.gov.uk’.

LEVEL 4: NEWSGROUPS AND DISCUSSION LISTS

Internet discussion lists and newsgroups are another rich source of information. Although much of the debate in these forums is of an anecdotal nature, they nevertheless provide an inside into the current opinions and concerns of both health consumers and health professionals.

DejaNews — Interest Finder

<http://www.deja.com/home-if.shtml>

With the number of newsgroups now in excess of 30 000, catering for virtually every interest and hobby, identifying relevant newsgroups can be a time-consuming process. However, using the DejaNews Interest Finder, it is possible to quickly identify relevant groups. For example, a search for ‘osteoarthritis’ on the Interest Finder suggests that [alt.med.fibromyalgia](#), [alt.support.arthritis](#) and [sci.med.diseases.osteoporosis](#) discuss this topic. All postings made to such newsgroups over the past few years are accessible through the Deja service.

Tile

<http://www.tile.net/>

Similar in nature to the Interest Finder, the Tile service provides a searchable directory to over 90 000 discussion

lists. A search here for discussion lists that may be of interest, for example, to an orthopaedic surgeon identifies a number of potentially relevant forums, including one run by the Orthopaedic Trauma Association.

EVALUATING WHAT YOU FIND

Because anyone can publish anything they like on the Internet — there is no peer-review process to thwart the hobbyist, extremist etc — it is important that everyone evaluates the information they find. This topic is covered in part two of this article, along with details of a number of online tools that have been designed to develop critical appraisal skills.

CONCLUSION

The Internet offers a wealth of information for all health professionals. From databases and full-text journals to multimedia teaching packages, telemedical applications and online discussion forums, the Internet has the potential to meet the information needs of all clinicians. Why this potential has not yet been realized has, in many respects, been a result of the difficulty in finding the truly useful, evidence-based resources that are available on the web.

This article has addressed some of the most common difficulties in finding relevant evidence-based information on the Internet by highlighting a range of resources that can be used to identify relevant and high-quality information. **HM**

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KEY POINTS

- Information overload is a problem that all health professionals face.
- Popular search engines are not the best way to search for health information on the Internet.
- Using a mix of bibliographic databases and evaluated subject gateways is the most effective way of finding high-quality medical information.
- Discussion lists and newsgroups are a rich source of information and should not be overlooked.
- Internet information is not subject to review and therefore should be critically evaluated.