

Evidence-based Dentistry: Part III. Searching for Answers to Clinical Questions: Finding E-vidence on the Internet

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A b s t r a c t

The Internet is rapidly becoming a valuable source of information for all health care professionals, as well as for the consumers of health care — patients and their families and friends. Information on the Internet is uncontrolled and generally unevaluated. The quality filter of peer review, present in published dental journals, is usually lacking in Internet-based health sources. There are, however, a number of well-developed, highly credible and useful resources available online that provide evidence-based information. In this paper, the third in a 6-part series on evidence-based practice, we discuss some of the sites that we have found to be most helpful for learning, teaching and practising evidence-based care.

MeSH Key Words: dentistry; evidence-based medicine; Internet

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The advent of the Internet has revolutionized commerce and industry and is having a tremendous bearing on the delivery of health care. Information can be transmitted and accessed instantly and inexpensively, by anyone, anywhere in the world. Patients can obtain the same health-related information that is available to professionals, with the potential for a profound alteration of the clinician-patient relationship. Most dentists have witnessed the knowledgeable patient, who comes in with downloaded information on oral health issues. However, information on the Internet is often uncontrolled and unevaluated and may be inaccurate. It is imperative, therefore, that dentists understand the advantages and limitations of the Internet and are able to use it effectively to guide practice and assist their patients in their pursuit of oral health.

This paper will help you to become a “power surfer” in your quest for answers to clinical questions. A number of the sites discussed in this paper make for interesting browsing at your leisure; at the same time, this introduction to evidence-based Internet sites should facilitate the “hit and run” searches¹ needed for the pragmatic, realistic practice of evidence-based dentistry on a daily basis.

Quality of Information on the Internet

Seeking information on the Internet can be time consuming, confusing and frustrating. For instance, at the time of this writing, there were 1,330 Web sites in 383 categories relating to dentistry listed on Yahoo (www.yahoo.com). Busy practitioners looking for evidence for patient care need resources that have been identified and validated if the Internet is going to be a practical tool for evidence-based dentistry.

Because the quality of information is so variable on the Internet, some criteria have been suggested to assess Internet sites.² These include the attributes and affiliations of the authors, the disclosure of funding sources, the regular updating of material, statements or (even better) linked citations leading to supporting evidence, endorsement by respected individuals or organizations, and common sense, coupled with your own experience and expertise. For a comprehensive discussion of this problem, the document *Criteria for assessing the quality of healthcare information on the Internet* from the Health Information Technology Institute is available online (<http://hitiweb.mitretek.org/docs/policy.html>).

An interesting site that takes a look at the other end of the quality spectrum is called Health Care Reality Check (www.hcrc.org/). This site has links to a number of interesting sites, including the National Council for Health Fraud, the National Council for Reliable Health Information and Quackwatch. While fun to browse, these sites are quite sobering in terms of the quantity of disreputable and unethical practices and they reinforce the need for dentists to become skilled at delivering evidence-based care.

A Guide to the Evidence

The best sites that we have found are those produced by academic centres, including university and hospital sites, government-sponsored and professional organization sites and the sites of several medical search engines.

Academic Centres

Academic centre sites generally feature many useful resources. These include not only ways to find valid, up-to-date clinical information, including links to MEDLINE and the Cochrane Collaboration, but also tools to help you learn to practise evidence-based care and to teach it to others. Many of these sites are linked to each other and to a number of other useful sites as well. The following list is by no means comprehensive, but represents some of the sites that we have found most useful.

The Centre for Evidence-Based Dentistry (www.ihs.ox.ac.uk/cebd/) is located at the Institute of Health Sciences, Oxford University, United Kingdom. At this site, among other things, you will find 2 particularly useful sections: "Evidence-based links" and "Evidence-based tools." Under the former are links to other centres, books and journals, teaching tools, guidelines sites, search sites and discussion lists. In the tools section are aids for teaching and learning evidence-based skills, pre-constructed search filters for MEDLINE, Palm Pilot tools for evidence-based medicine and more. A wealth of resources is available through this highly recommended site.

The School of Health and Related Research (ScHARR) at the University of Sheffield in the United Kingdom has a comprehensive document entitled *Netting the evidence: A ScHARR introduction to evidence based practice on the Internet* on their Web site (<http://www.shef.ac.uk/~scharr/ir/netting>). This document is an alphabetical compilation of links to numerous multilingual and international resources. Two especially interesting features are a set of self-assessment exercises and a link to a current awareness service that allows users to browse articles on evidence-based medicine from the MEDLINE database.

The Health Information Research Unit at McMaster University (<http://hiru.hirunet.mcmaster.ca>) in Hamilton, Ontario, has become internationally famous. This extensive, detailed site features many useful resources. It includes

links to information and abstracts from the Cochrane Collaboration and the Canadian Cochrane Centre, notes from a workshop on how to teach evidence-based clinical practice and a guidelines appraisal project (GAP) with full listings of ongoing and completed projects.

The library of the Ottawa General Hospital (www.ottawahospital.on.ca/professionals/library) provides a large collection of links to resources for evidence-based health care. In January 1998, this collection was recognized for excellence by the editors of *Medicine on the Net*. It includes links grouped under the headings of the Cochrane Collaboration, clinical trials and systematic reviews, critical appraisal, educational resources, searching and tutorials, guidelines, health technology assessment, journals and publications, and resources. Resources are further subdivided into a number of specialties, including dentistry.

The University of Toronto Centre for Evidence-based Medicine (www.library.utoronto.ca/medicine/ebm/) is based at Mount Sinai Hospital — part of the University Health Network. It has several useful features, including a large set of links to useful evidence-based medicine resources on the Internet (including journals, CDs, textbooks and Web sites), syllabi and a glossary of evidence-based terms. The resources do focus on medicine, but most are quite relevant to dentists.

The Canadian Centres for Health Evidence (www.cche.net) is a project based out of hospitals in Alberta and Winnipeg but having numerous other partners. Within a centre, staff monitor knowledge-based software and literature from a variety of public and private sources. Significant resources are identified, and for these items, structured summaries are developed to alert the user to the quality of evidence supporting health recommendations, the relative importance of recommendations and how the needs of specific patients, practitioners and settings are addressed. This site includes many users' guides to evidence-based practice and users' tools for the health literature.

Government-Sponsored and Professional Sites

The best known sites in this category are the National Institutes of Health (NIH) National Library of Medicine databases, particularly MEDLINE via PubMed (www.ncbi.nlm.nih.gov/) and NLM Gateway (<http://gateway.nlm.nih.gov/>), both of which were discussed in the previous paper in this series.³ For anyone with specific clinical or research interests, a very useful site is MedFetch: Automated Medline Queries (www.medfetch.com). Free registration and a licence agreement are required, but a privacy statement stresses the confidentiality of your information. To set up an Automated Medline Query, you are advised to refine your search terms using PubMed. You then enter your terms, select a frequency (weekly or monthly) and select a citation format (just titles or titles plus abstracts), and the most

recent (up to 20) citations are e-mailed to you on a regular basis until you cancel the search.

Other useful sites are those that compile evidence-based clinical practice guidelines and those that list clinical trials.

Evidence-based Guidelines

At the time of this writing, there are few published evidence-based guidelines available in dentistry, although there is strong interest and some significant efforts are underway.^{4,5}

One of the most extensive collections of guidelines can be found in the National Guideline Clearinghouse (NGC). This database can be accessed through the Web site of the Agency for Healthcare Research and Quality (www.ahrpr.gov/clinic/cpgsix.htm) of the U.S. Department of Health and Human Services. A search of the NGC using the term "dentistry" yielded 26 guidelines, 15 of which were developed by or with input from the dental profession. Only 2 of the 15, both of which were done in Canada, used evidence-based methods; the remainder were based on group consensus and expert opinion.

The Scottish Intercollegiate Guidelines Network (www.show.scot.nhs.uk/sign/) has published 43 guidelines, including one dental topic on the removal of third molars. Another guideline specific to dentistry is in preparation and relates to caries prevention in children. The National Institute for Clinical Excellence (NICE) (<http://www.nice.org.uk/>) in the United Kingdom has also published a guideline on the management of third molars.

There are several other sites of interest, which, although they do not contain guidelines for dental topics, provide an excellent introduction to the philosophy and methods of evidence-based guideline development. For instance, the Canadian Medical Association clinical practice guidelines site (www.cma.ca/cpgs/) provides methodological guidance for the development of guidelines, as well as a handbook on the implementation of guidelines. The German Guidelines Information Service (www.leitlinien.de/gergis.htm) has evaluation criteria, as well as an appraisal instrument to evaluate the methodological quality of published guidelines.

Clinical Trials in Progress

NIH Clinical Trials (<http://www.clinicaltrials.gov/>) is a searchable site where you can do a broad search in a subject area to find clinical trials in progress or those recently closed to accrual. If you prefer, you can click on "focused search" to limit your search to a particular trial site, age group, study type (phase I, II, III, etc.), specific disease or condition, or funding body. There are also links on the site to other resources. Dental information is available: a quick, unfocused search on "oral cancer" located 7 clinical trials in progress.

Although not related to a government agency or professional organization, the Current Controlled Trials

site (www.controlled-trials.com), developed by Current Controlled Trials Ltd., is a reputable commercial site, part of the Current Science Group of companies. Registration is required to access this site. Advisors to the site are senior academics, clinicians and health care specialists. The site contains a meta-register of controlled trials (mRCT), which contains 6,373 trial records in 15 registers at the time of this writing. It has an excellent search capability, with a "Tips" link that provides advice on search strategies. The site links to PubMed and over 85 other online registers of controlled trials.

Medical Search Engines

There are several excellent medical search engines with remarkable search and retrieval capabilities for relevant health care information. Two particularly good sites are CliniWeb International and Medical Matrix.

CliniWeb International (www.ohsu.edu/clinweb/) is a multilingual index and table of contents to clinical information on the Web. It is produced and maintained by medical informatics specialists at the Oregon Health Sciences University. CliniWeb has identified and indexed by topic over 10,000 clinically oriented Web pages, using the national Library of Medicine's Unified Medical Language System (UMLS) and Medical Subject Headings (MeSH) vocabulary. The focus of the site is clinical information relevant to health care education and practice; consumer-oriented information is filtered out. Each MeSH disease term links to PubMed. For each term, there are 4 links with ready-made searches for therapy articles, disease articles, reviews or all articles.

Medical Matrix (<http://www.medmatrix.org/>) is a commercial site for which free registration is required, but which has a clearly stated privacy policy. It provides access to clinical medicine resources that are peer-reviewed by an editorial board, drawn from the American Medical Informatics Associations' Internet Working Group. The site includes links to journals, symposia presentations, continuing education resources, textbooks, databases (such as MEDLINE), prescription assistance resources (such as searchable drug interaction databases), predetermined clinical searches and more. Dentistry is listed under the category "Healthcare and Professionals" as a specialty, and dental resources are available. Each Internet site is ranked, using a 5-star system, according to its usefulness for point-of-care application. Examples of 5-star sites are the Drug Monographs from the *US Pharmacopeia* and the *1999 Merck Manual*, both of which are free. In addition, it is noted whether or not free registration is required (for example, Medscape Journals, a searchable collection of full-text journal articles) and whether or not a fee is charged (for instance, Scientific American Medicine or Harrison's Online Principles of Internal Medicine).

Once you have found evidence that looks promising, you need to assess its credibility and its usefulness for your patients. To critically appraise clinical studies, a basic knowledge and understanding of research design is helpful. In the next article in the series, an introduction to the types of research designs commonly encountered in the dental literature will be presented. ♦

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C D A R E S O U R C E C E N T R E

The Resource Centre information package on *evidence-based dentistry* is available to CDA members at a cost of \$10.00 (plus applicable taxes). To obtain the package, contact us at tel.: 1-800-267-6354 or (613) 523-1770, ext. 2223; fax: (613) 523-6574; e-mail: info@cda-adc.ca.



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