

Review Articles

Medical Surfing

Latif A. Khan, MD, MRCP (UK), Sarosh A. Khan, MD.

ABSTRACT

The Internet has revolutionized information technology. Vast amounts of latest information are available on the Internet to medical professionals. Medical surfing is fast becoming part of a doctor's profession. But the way to approach the Internet and retrieve useful information from myriads of medical websites seems a daunting task to many. This review aims to help the newcomer, the medical students and doctors in obtaining fruitful medical information while surfing. It will prevent them from the feeling of getting drowned in the ocean of medical information. As medical information is not restricted to books and journals, providing Internet addresses of different medical bodies with few salient features, will go a long way in helping attain the required information without wasting time. The Internet will soon become a universal library. Medical surfing should be included in the curriculum of all medical schools and universities.

Keywords: Medical surfing, internet, medical information, medical websites.

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The Internet (net) is spreading rapidly to all countries. The information from the net is not only fast and accurate but also economical and the latest. Soon the net will be considered as a universal library. Surfing the net has become popular both among the young as well as the old. Medical professionals use it in retrieving the latest information about a disease and its management. Research has been facilitated due to ready access to huge amounts of information from the scientific databases and references. This had not been possible previously with the printed form especially in the underdeveloped and the developing world. For surfing one needs a computer with a modem, a telephone line and subscription to a server who will allow access to the net, then one dives in the ocean of information! However, such information overload can present a problem to anyone who is not net-savvy. With so many websites available, how does one go ahead? New sites are propping up daily. Therefore there is a need to guide doctors and health care personnel through this wealth of knowledge. We have divided this article into different topics for easy accessibility of various websites. We have checked and found live all of the links listed below before submission.

Basics of the Internet. Before you start surfing the web, you have to know some of the basics of the net. The list below does exactly the same. So learn your way around the web with these user-friendly and highly recommended sites. *Learn the Net* (www.learnthenet.com/). This site is one of the best of its kind on the web. Here you will find information on how to "Surf the Web," "Harness e-mail," "Download Files," and much more. *Beginners' Central* (www.northernwebs.com/bc/). This site will help you learn how to surf the net, how to write, send, and retrieve e-mail, and how to locate your site of interest. It is structured as a series of chapters that may be read sequentially or individually. Chapter headings include "Learning While You Surf!" "Offline Operations and File Downloading," and "FTP". *Beginners Central* is one of the top 500 websites in the world. *The University of Aberdeen WWW Information Pack* (www.abdn.ac.uk/diss/webpack/) This site assumes the form of an online book-cum-tutorial with attractive presentation and graphics from the University of Aberdeen, Scotland. It is divided into 3 sections - "Using the Web," "Authoring for the Web," and "Mastering the Web" - with 29 chapters, each concentrating on a particular aspect of web use.

From Najran General Hospital, Najran, Kingdom of Saudi Arabia.

Address correspondence and reprint request to: Dr. Latif A. Khan, Najran General Hospital, PO Box 5073, Najran, Kingdom of Saudi Arabia. Tel. +966 (7) 5432943. Fax. +966 (7) 5421932. E-mail: latifmrp@yahoo.com

It is informative, easy to navigate, and offers a number of good links.

Medical database search. There are 3 main approaches to locate information on the world wide web (WWW): 1. *Subject Directories*: are available on well-known sites as Yahoo! (www.yahoo.com) and Excite (www.excite.com). Out of the logical category 'health' one can surf through 43 sub-categories. Thus for a new user it may be an ideal starting point.¹ However for a medical professional it may seem too general or dilute. 2. *Search Engines*: are active databases that provide links to www pages using the spider. These spiders, which are basically computer programs, search the net quickly and systematically and within a few seconds a huge resource is in front of you. Important search engines are AltaVista (www.altavista.com), Northern Light (www.northernlight.com), Infoseek (www.infoseek.com), and Lycos (www.lycos.com). Just type a keyword or virtually anything and the engine will return a resource location on the web. Unfortunately sometimes the list is so extensive and irrelevant that you give up. Keeping the search words as specific as possible, avoiding prepositions like 'of', 'in', 'at', and using synonyms if things do not work, may avoid disappointment to a large extent. If nothing helps better use another search engine.² 3. *Detailed Subject Guides*: are maintained by organizations focusing on specific topics. Specialized search engines may be available which have access to information unavailable to more general search engines. Detailed subject guides of importance to medical professionals are: OMNI (Organizing Medical Networked Information (www.omni.ac.uk) which is the United Kingdoms gateway to high quality Internet resource in health and net information skills for medical professionals. Health on net (www.hon.ch/) is a Swiss nonprofit foundation for health care providers and professionals and has a link to Medline.

MEDLINE and other databases. MEDLINE is a database of more than 9 million references and abstracts from 1966 to the present, which can be searched through PubMed and Internet Grateful Med. Possibly the best way to take the fullest advantage of MEDLINE is to learn Internet Grateful Med. This and other sites are listed below. *Internet Grateful Med User's Guide* (www.igm.nlm.nih.gov/splash/IGM.survival.guide.html) This is a fairly detailed introduction to Internet Grateful Med, providing information with examples that demonstrate many of the system's capabilities. You may use this guide in a hypertext form or print it out. Printed in 12-point type, the document runs to 14 pages. Internet Grateful Med is a www application running on a gateway system at the US National Library of Medicine (NLM). In addition to searching MEDLINE, Internet Grateful Med provides assisted searches of AIDSLINE, AIDSDRUGS, AIDSTRIALS, DIRLINE, HealthSTAR, HSRPROJ,

HISTLINE, OLDMEDLINE, SDILINE, SPACELINE, BIOETHICSLINE, POPLINE, TOXLINE, and ChemID. A brief description of each database is available on the introductory screen. The system helps you create and refine a search, and then submits the search to PubMed or Elhill, the NLM's retrieval engines. *PubMed* (www.ncbi.nlm.nih.gov/PubMed/) provides access to more than 11 million citations in MEDLINE, PreMEDLINE, and other related databases, with links to participating online journals. *BioMedNet* (www.bmn.com/) is a website for researchers in medical science. Registration is required to access the site, but it is free. BioMedNet is one of the most useful sites for any medical graduate, providing access to more than 170 biological and medical journals.

Medical Journals. Many journals are available on their respective websites, which can be directly approached and the content read. These sites are very useful for regular reading purposes and keeping oneself up-to-date. For journals available on the net, addresses can be found on the printed version of the Journal. Many are available to subscribers only. Some of the common and prestigious ones are: British Medical Journal (www.bmj.com/), The Lancet (www.thelancet.com), New England Journal of Medicine (www.nejm.org/contents/index.asp), Annals of Saudi Medicine (www.kfshrc.edu.sa/annals), Saudi Medical Journal (www.smj.org.sa), JAMA (www.jama.com) or (www.ama-assn.org/public/journals/jamahouse.htm), ENT Journal (www.entjournal.com/), Archives of Ophthalmology (www.archophthalmol.com), Dermatology Online Journal (dermatology.cdlib.org/) (note that the address for this journal does not have www).

Collective Journals. *Medconnect* (www.medconnect.com/) is one of the more informative sites. After a simple formality of free registration one can have access to Continuing Medical Education (CME) series in Medicine, Pharmacy and Nursing. Dozens of topics are discussed under subheadings of Emergency Medicine, Family Practice and Managed care. The full version of the Interactive Journal of Pediatrics is also available. *Free Medical Journals* (www.freemedicaljournals.com). This site gives a list of all the medical and basic science journals available free online. Some of the journals become available free on-line after a period of few months of publication. *Doc Net* (www.docnet.org.uk/journal-frames.htm). This contains information from the BMJ, British Journal of Neurology, Neurosurgery and Psychology, as well as from the Doctor. Docnet home page gives you links to medical sites around the globe, a search facility to Medline, and detailed information regarding Family Medicine and Geriatric Medicine. *Cambridge Journals* (www.journals.cambridge.org) contains information about the journals of diverse specialties from medical

to agriculture to sociology. *Primary Care Internet Guide* (www.uib.no/isf/guide/journals.htm) provides journals on various topics for public health professionals, nurses as well as the medical students.

Evidence-Based medicine sites (EBM). Evidence based medicine is defined as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients."³ Presently this best evidence comes from the net. The sites that promote EBM are: *Cochrane Library* (www.hcn.net.ac/healthbase/cochrane/intro.htm) is an electronic publication designed to supply high quality evidence to inform people providing and receiving care. It caters to those responsible for research, teaching, funding and administration at all levels. It is published quarterly on CD ROM and the net and is available on a subscription basis. Browsing through the abstracts of Cochrane reviews is free. *Update-software* (www.update-software.com) gives access to the Cancer Library and Reproductive Health Library (RHL). Guidance for conducting meta-analysis on Metaxis is also available. *Scientific American Medicine* (www.samed.com) provides comprehensive information about all specialties of general medicine. In addition many international workshops and conferences are well established in teaching EBM. Best ones on the Net are from the *McMaster University in Hamilton* (www.hiru.mcmaster.ca/ceb/) and National Health Services R&D Center for EBM, Oxford University (www.cebm.jr2.ox.ac.uk). As recommended by Stewart,⁴ health ministries and academic institutions should consider examining the feasibility of establishing their own EBM centers in conjunction with the International Clinical Epidemiology Network (www.inclen.org).

Sites for exchange of information/discussion of medical problems. A number of sites have been opened by organizations and pharmaceutical companies to provide information to the patients, the common man as well as to health care professionals. Some important sites available on the Net are for diseases as varied as diabetes mellitus (www.diabetes.org), hepatitis (www.hepatitis.org), HIV/AIDS (www.hiv.org), neurofibromatosis (www.nf.org), and systemic lupus erythematosus (www.lupus.org). American Academy of Allergy, Asthma, and Immunology (www.aaaai.org/) is a specialty site which offers links and other resources to help you find information on allergies and immunology, as well as other medical topics. The NLM's Specialized Information Services provides latest information about HIV/AIDS (www.sis.nlm.nih.gov/hiv.cfm). The National Cancer Institute (NCI) provides information about cancer and cancer sites (www.cancernet.nci.nih.gov/). Some sites offer chats with doctors and other health care experts (www.healthatoz.com/atoz/chatrooms/chatbody.asp). Chat schedule and 'How to Chat' is

also described. A list of chats to come as well as Chat Archives is provided. One can log on and participate live. International Pediatric Chat (www.pedschat.org/) allows you to participate in a variety of online chats on pediatrics. Similar facility is provided by Health.com (www.health.com/) in its section on Discussions. HealthGulf (www.healthgulf.com/) has provided facility whereby experts answer health related questions asked by the people, under 'Ask the Doctor' section. Many individuals have put up medical information for patients on their web pages (www.saroshkhan.20m.com/custom2.html). Doctors on the Web: WebMD (www.webmd.com/) provides a search for any doctor working in the United States. Just typing his name and the name of city provides you the detailed information about the doctor. His qualifications, clinic address, his ratings among patients and so forth are displayed. So one may select a doctor for himself on the Net. Doctors in India can be found on (www.hyddoctors.com/). Similar effort is probably underway in Saudi Arabia (www.healthgulf.com/). Many hospitals too advertise about the facilities they provide, the departments and the staff they have as well as job opportunities if available. This has become common here in both government hospitals (www.kfshrc.edu.sa/), and also in the private sector (www.erfanbagedohospital.com), as well as outside the Kingdom (www.tatamemorialcentre.com/). Medical advice and help on the mobile is available at webhealthplus.com (www.hyddoctors.com/mobile/default.asp).

Major Publishers. *Blackwell Science* (www.blackwell-science.com/) provides access to books, CDs and journals published by this group. Under Medirect (www.medirect.com/) journals are available on almost all subjects under 29 different subspecialties. The Journal of Internal Medicine (www.medirect.com/cgilib/journal.asp) is online as also The European Journal of Clinical Investigation, Health Information and Libraries Journal and others. However only the table of contents (TOCs) is for free. The TOCs of all the 12 issues of these journals is available from 1997 to the latest one (present month of 2001). Articles in the full form can be viewed only after subscription. The same publisher has opened a site named GastroHep.com (www.gastrohep.com/) which provides abstracts of selected gastroenterology, hepatology and endoscopy articles from prestigious journals as JAMA, Nature, Gut, and BJC (British Journal of Cancer). There is a page on Patient Advice (www.gastrohep.com/patadvice/) available after subscription. Full version of GastroHep is available at an annual subscription rate of US\$ 100 for doctors in North America and US\$ 65 for rest of the world. Doctors in developing countries with an annual income of less than US\$ 10,000 are allowed free access after due application online. *Blackwell Science* also provides access to

problems related to nurses in their site (www.thatnursingsite.com/). Journals and articles on nursing topics, information regarding jobs and training for nurses are also displayed. *Mosby* is a leading publisher of the Harcourt Health Sciences Family of Companies. It provides free access to a number of periodicals (www.harcourthealth.com/periodicals/). One can browse through an extensive collection (total 328) of medical, nursing, dental, and allied health periodicals. This includes journals like *American Heart Journal*, *BJC*, *Cardiology Clinics*, *Disease-a-Month*, *Endocrinology and Metabolism Clinics*, *Evidence-Based Health Care*, *Gastroenterology*, *Hepatology*, *Yearbook of Medicine*, *Yearbook of Surgery* and many more. Access to ordering online is available. *Barnes and Noble* (www.bn.com/) publisher site makes available information about a number of medical books that are basically meant for the common man. Topics as varied as allergies, death and dying, to home remedies are displayed. Recommended for patient information. *Textbooks online*: A regularly updated latest edition of Harrison's Principles of Internal Medicine (www.harrisononline.com/) is on the web. However one has to subscribe for viewing all the contents in details. Annual subscription is US\$ 89.

Major Medical Organizations. *The World Health Organization (WHO)* has a website which provides all the information about its activities and the annual reports. Browsing and downloading of any article or report is free. WHO (www.who.int/) discusses in details various diseases under these headings: communicable/infectious diseases, tropical diseases, vaccine preventable diseases, environment, family and reproductive health, health policies, statistics and systems, health technology, lifestyle, and non communicable diseases. *The International Red Cross and Red Crescent Society* (www.ifrc.org/) gives latest information about natural calamities, violence, wars and the work being carried out by the organization. The annual report is also available. *DIRLINE* (www.dirline.nlm.nih.gov/) is the directory of health organizations in the world. The site has provided a search for the same.

Other interesting medical websites. Out of the thousands of medical sites of interest, we provide a short list that will appeal to a broader base of doctors.

Health AtoZ Professional (www.medconnect.com/) offers a link to Medline, in addition to numerous articles of its own. Register for free the first time you access the site, and will be asked for your user name and password on subsequent visits.

TheMDsite.com (www.theMDsite.com/) discusses, explains and teaches the electrocardiogram on the net. *Medscape* (www.medscape.com/Home/Topics/multispecialty/multispecialty.html) also requires you to register to access the various subsections, but registration is free. A subscription service to newsletters in a

variety of interests is available, and MEDLINE is a standard feature. *Neonatology on the Web* (www.neonatology.org/) is a site offering a variety of clinical and historical information for neonatologists and pediatricians. It also offers a good collection of links to other neonatology websites. *Doctor's Guide* (www.docguide.com/) is a very good, resourceful website. You must register, and a registration box will pop up when you access the site. The Doctor's Guide e-mail service keeps you informed of the latest developments in a variety of disciplines. *TopicDoc* (www.topicdoc.com/) was formerly called MedSite. It is a quick, topic-driven medical literature service that's easy to use. Registration is required, but is simple. *The American Academy of Pediatrics* (www.aap.org/) is an organization of 55,000 primary care pediatricians, pediatric medical sub specialists, and pediatric surgical specialists dedicated to the health, safety, and well-being of infants, children, adolescents, and young adults. A very good site for pediatricians. *Martindale's Health Science Guide-2000* (www.sci.lib.uci.edu/HSG/HSGuide.html) is an online multimedia tutorial with a subsection devoted to obstetrics, pediatrics, and gynecology. Overall the site contains more than 56,500 teaching files, 127,000 medical cases, 1,075 multimedia courses and textbooks, access to more than 3,570 databases, and over 10,400 movies. *Medical Conferences.com* (www.medicalconferences.com/) provides free, detailed information on more than 7,000 upcoming medical meetings and conferences around the world. It is maintained by a private corporation in the United Kingdom that works with meeting organizers and the pharmaceutical and travel industries, and provides convenient and up-to-date conference information for researchers and physicians. The conference lists are updated daily, and can be searched by title, date, location, and keywords. The entries for registered conferences can be searched for details on main topics, keynote speakers, specialist workshops, social programs, and deadlines. Online registration for conferences is also available. *GeneClinics* (www.geneclinics.org/) is a growing database of concise descriptions of specific inherited disorders designed to help physicians relate genetic test results with diagnoses, treatments, and counseling for individuals with hereditary illnesses. *MedMatrix* (www.medmatrix.com/) is a site dealing with buying and selling of medical equipments. *UW Radiology Webserver* (www.rad.washington.edu/) is an excellent radiology site from the University of Washington. It includes a Virtual Case of the Week, complete with x-rays to examine and a test form to submit, extensive radiology teaching files and pediatric emergency room cases, anatomy teaching modules, and an online textbook of musculoskeletal radiology. The site also includes online patient information and software archives. Various links to radiology websites are provided. *ClinicalTrials.gov*

(www.clinicaltrials.gov) is a service of National Institute of Health (NIH), Bethesda, Maryland. It explains about various types of clinical trials and how they are to be conducted. There is a 'Search Clinical Trials' where you can type a word or phrase and the various trials underway at that time are displayed. This is a recommended site for doctors involved in research.

In conclusion, medical surfing is becoming increasingly important as a means of information. It allows for rapid communication, update in knowledge, search for information and exchange of ideas. Internet and medical surfing will soon be included in the medical curricula in the world. We hope that with the information on the latest

modalities of management proven with best evidence, the net will help medical professionals in improving the quality of care provided to patients.

References

1. Kiley R. Medical information on the Internet: A guide for health professionals. 2nd ed. Edinburgh; New York: Churchill Livingstone; 1999.
2. Venditto G. Search engine showdown. *Internet World* 1996; May 1996: 79-86.
3. Evidence-Based Medicine Working Group. Evidence-based medicine: a new approach to teaching the practice of medicine. *JAMA* 1992; 268: 2420-2425.
4. Stewart A. Evidence-Based medicine: a new paradigm for the teaching and practice of medicine. *Annals of Saudi Medicine* 1999; 19: 32-36.