

# Medical management through Internet

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**A physician practising in a remote village can now consult the specialist sitting in a city instantaneously by providing him the images and data on-line, thus eliminating the risk involved in a delayed treatment and also saving the time and money on transport. Thanks to Internet—the biggest technological breakthrough of this century. All information across the globe, whether archived or generated today, is ready to be displayed on your computer screen at the command of your finger tips.**

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**H**EALTH care is an important area which generates a wealth of information in the form of journals, reports, conference proceedings, etc. Medical data is often of complex nature, consisting of a mixture of text, sound and visuals. Doctors and health care professionals not only require a written report but also want to know how the patient sounds, how he looks and what the X-ray features are and so on. They may receive information from large number of sources—from patients, medical laboratories, nurses, fellow doctors, pharmacists, management

and medical knowledge sources, etc.

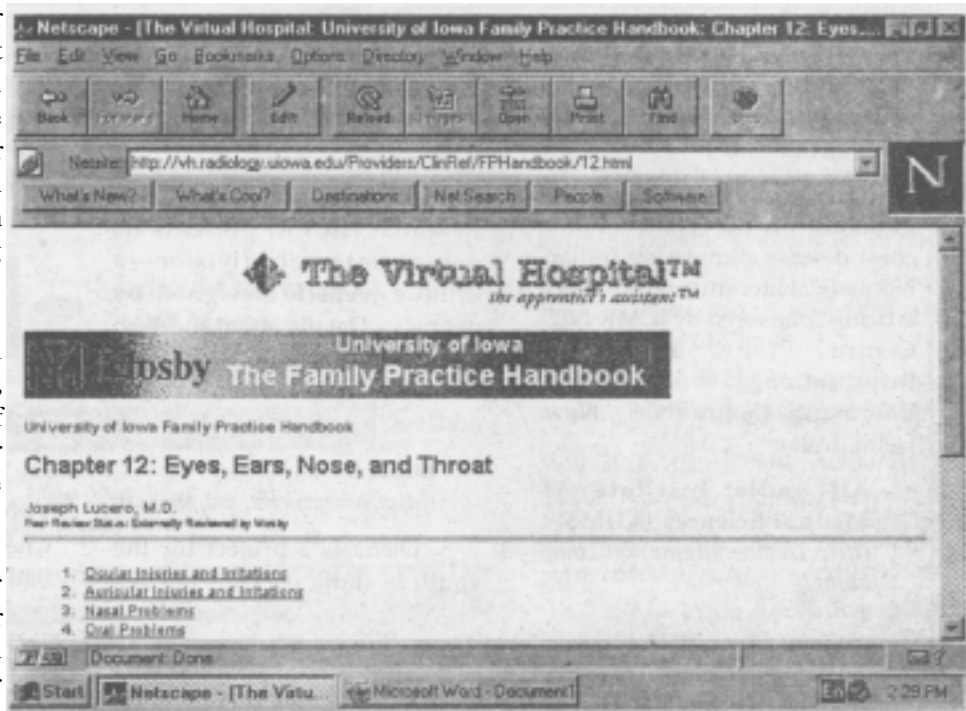
It was possible for a doctor until two generations ago to know the whole of the medicine. Because of the massive growth of literature in this area in the post Second World War-era, it is not possible for a health care professional to keep himself abreast of all the developments taking place in his field of interest, by searching it manually. A cumulated total of all the papers indexed in four publications namely Chemical Abstracts, Engineering Index, Index Medicus and Physics Abstracts gives a figure of just under 200,000 in 1950, which rose to about 300,000 by 1960 and to over 800,000 by 1976. In 1988 this figure was nearly one million, in 1997 the number of articles in Index Medicus alone has risen to over seven million.

Twentieth century has seen the advancements in medicine, psychology, electronics, television and computer science, where as physics and mathematics have seen the progress in the seventeenth century, chemistry in eighteenth century and biology in nineteenth century. So the progression of medicine, computer and electronics took place simultaneously. The computer age (since 1960s) changed us how to compute. The telecommunications age (since the 1970s) is changing the way we live, communicate and travel and the

Information age (since the 1980s) is shaping our lives for tomorrow. Intelligent networks with teleports created a new information infrastructure for 'talking, travelling and thinking'. Interactive media (beginning in the 1990s), which combine video, images, sound and data are expected to create a new generation. Today the visualisation of Marshal Me Luhn in 1968 of 'Global Village'—a borderless world in which the communication media would transcend the boundaries of nations—has come true.

Taking advantage of the advancements in the field of information science & technology, the bibliographic control of such vast information was largely done by on-line database producers, who provide access to information via international networks. MEDLARS, EMBASE, BIOSIS and SCI are some of them. The inherent problem faced in accessing these databases is to learn the search commands which are tedious and one has to depend on intermediaries to fulfil the information needs. With the advent of Internet, access to information resources (on-line database producers, CD-ROM vendors, full text documents of various societies and the commercial agencies, news groups, directories, individual home pages and corporate resources), have made a marked difference in the perspectives of health care professionals.

Before searching for information on Internet, it is imperative for health care professionals to be aware of different tools for finding information on Internet. Information can be retrieved by using various search engines, browsing different directories, e-mail addresses, gopher, archies, newsgroups, etc. The brief features of the major resources and tools are given below:



**FTP:** File Transfer Protocol (FTP) is a tool for retrieving files back and forth and is useful for retrieving files from public archives scattered around the world. For example, in case a health care professional wants to access the Handicap Database and Digest, which contains the software and medical information for the handicapped, the site address is:

*ftp handicap,shel.isc-br.com login: anonymous*

and for Medical Resources List the site address is:

*ftp ftp.pura.net login: anonymous, get/pub/nic/medical.resources.x-y*

**Telnet:** Telnet is used for logging into other computers on the Internet. It is used to access databases, library catalogues, etc. If you want to access the MEDLINE database for medical literature search, the site is:

*telnetlibrary.umdnj.edulogin: library*

in order to access the Medical Educational Technology Network which gives information on audio-visual technology, digital imaging

and computer aided instruction in medicine, the site is:

*telnet etnet.nlm.nih.gov login: etnet*

**Gopher :** Gopher lets the user to hop around Internet by selecting resources from menus. Gopher's interconnected menus allow one to go deeper until the desired information is found . The site is

*gopher.unt.edu login:gopher*

once you are logged in, it will present a menu screen from and one can choose the option and find the required information.

**Archie:** Archie lets the user to locate a file on the Internet. Archie is actually the collection of servers. It regularly updates a catalogue of 1300 anonymous ftp sites of approximately 2.5 million unique file names, In order to run Archie interactively, telnet to one of the server sites:

*telnetarchie.ru tgers.edulogin:archie*

**Word Wide Web (WWW or Web):** This is a part of vast network of computers around the world that form the part of Internet. Documents or pages on the Web are linked together by a Hyper Text Markup Language (HTML) which allows sound, graphics and text to coexist on the same pages. Web page can be accessed through 'Browsers' and require a TCP/IP connection. Some of the browsers currently in use are:

**Mosaic :** Mosaic is first graphical browser By using Mosaic there is no need to switch between the different Internet application like anonymous ftp, Gopher and Wais as they are already included in the browsers and operate automatically. A free client of mosaic can be downloaded from the following sites:

## Some Indian medical sites

- **TB India**  
(<http://tbindia.info.nih.gov/project1.html>):

It is a national bibliographic database on tuberculosis and chest disease comprising Indian biomedical literature. The project is being sponsored by ICMR-NIC Centre for Biomedical Information, National Informatics Centre (NIC), New Delhi, India.

- **All India Institute of Medical Sciences (AIIMS)**  
(<http://www.pugmarks.com/aaims/>)

- **BITE-IN**  
(<http://wiviv.bitin.com/>):

Indian Institute of Continuing Education & Research (IICER) presents its dental internet division—a unique website designed by dentists. Details about the Web sites can be explored after visiting the Web sites at the above address.

- **DISHA**  
(<http://www.netfx.net/disha/>):

Disha is a project for the youth in India on issues of sex

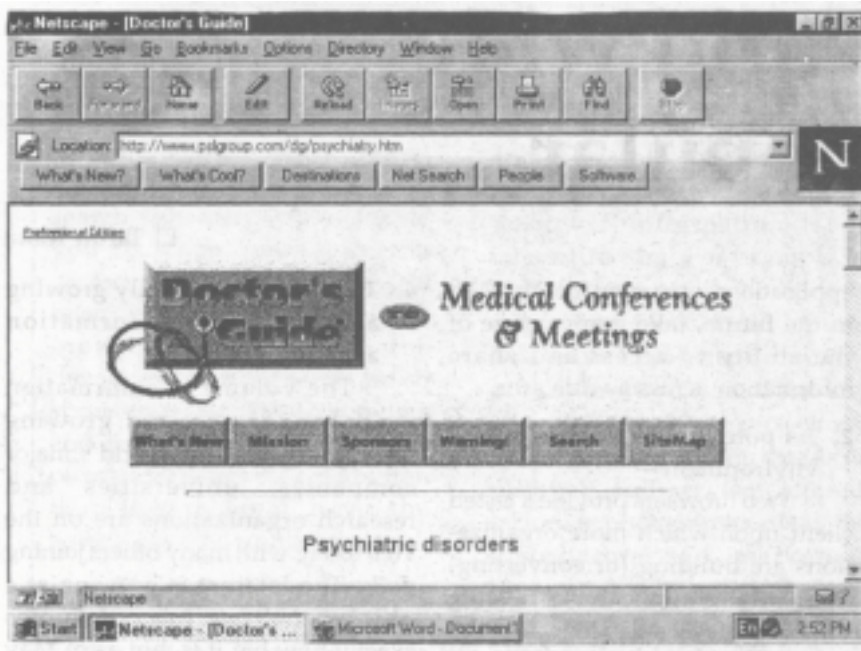
and sexuality with specific emphasis on safer sex and prevention of STDs including HIV/AIDS.

- **Institute of Speech & Hearing**  
(<http://www.mahesh.com/>):

- **Schizophrenia Research Foundation**  
(<http://www.xmission.com/>):

A site of a non-profit, voluntary organization in Chennai, India, that is waging a battle against schizophrenia.





(a) for windows:

<http://www.ncsa.uiuc.edu/SDG/software/WinMosaic/general.html#obtain>

(b) for Unix:

<http://www.ncsa.uiuc.edu/SDG/softwarebrochure/UNIXsoftDesc.Html#XMosaic>

**Netscape:** Netscape allows to open two or more Netscape windows to work with different Web pages simultaneously. It also keeps a list of its own favourite sites, which can be used by highlighting and choosing. A free client of Netscape can be downloaded from the following Web site:

<http://home.mcom.com/coproduct/mirror/index.html>

**Cello:** Cello is a PC browser which supports WWW, Gopher, ftp and Usenet browsing and can be used to view hypermedia documents. Free client of cello can be down loaded from the following Website

[http://www.law.cornell.edu/cello/cello\\_top.html](http://www.law.cornell.edu/cello/cello_top.html)

**Microsoft Internet Explorer:** It provides an easy way to access and display Web pages, whether they are stored on your computer, your local network or on the Internet. Information on Internet Explorer can be found from:

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

**Lynx:** A non-graphical

hypertext Web client for users running cursor addressable displays. It provides users with full access to the Web, allowing them to navigate and select hypertext links with cursor keys. Lynx runs on UNIX, VMS and DOS environment. Lynx is available from the following ftp site:

<ftp2.cc.ukans.edu> and files are located in /pub/lynx

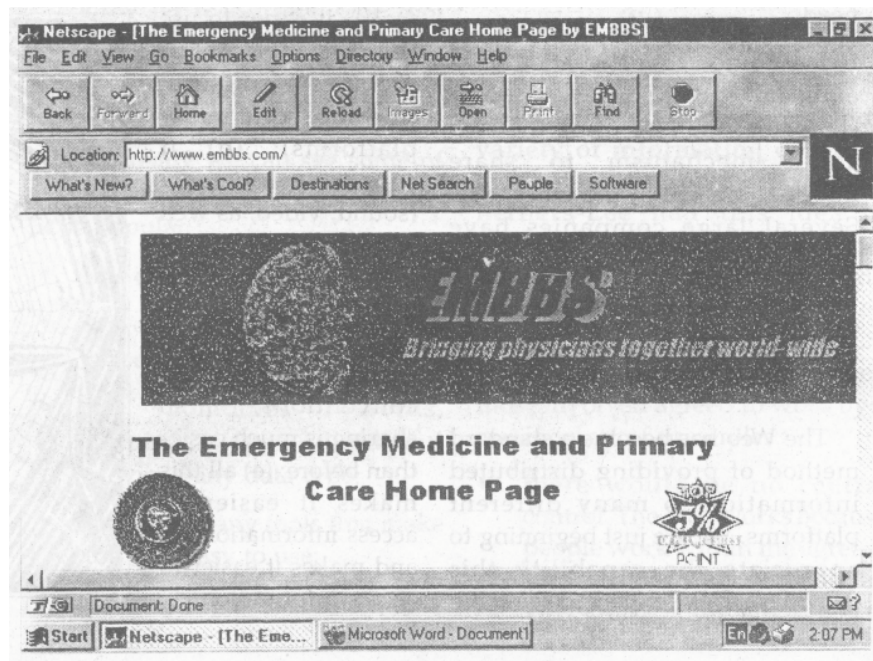
Other free client browsers are available at the following web sites:

**Win Web:** <http://www.einet.net/EINet/WinWeb/WinWebHome.html>

**Netcruiser:** <http://www.ix.netcom.com/netcom/software/cruiser.html>

**WAIS:** Wide Area Information Server (WAIS) refers to a system for organizing information into databases that can be queried using a set of commands known as a natural query language. A view of WAIS databases can be looked in the directory of WAIS server maintained by WAIS (<http://www.wais.com/>).

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## Internet for Health: Medical Management through Internet

### Some of the world's medical web sites in important specialized areas

- **ADDICTION AND SUBSTANCE ABUSE—**

- **Dual Diagnosis Web:**

(<http://www.erols.com/ksciacca/>).

- **AIDS-**

- **AIDS reader at Medscape:**

(<http://www.medscape.com/Home/Medscape-AIDS/Medscape-AIDS.html>);

- **International Association of Physicians in AIDS Care:**

(<http://www.webmedlit.com/topics/VirusLit.html>).

- **ALLERGY—**

**Allergy and immunology reviews for primary care—**Providers Abstracts and reviews of important journals.

(<http://www.mcphu.edu/libraries/resources/reviews/immun.html>);

- **Doctor's guide to allergy & immunology conferences:**

(<http://www.pslgroup.com/dg/immuno.htm>).

- **ANAESTHESIOLOGY—**

- **AnaesthesiaWeb:**

(<http://www.anesthesiaweb.com/>).

- **AVIATION MEDICINE—**

- **Aviation and Aerospace Medicine Mail List:**

(<http://www.ozemail.com.au/~dxw/aeromed-list.html>).

- **BARIATRICS—**

- **Nutrition and Obesity Patient Instructional Materials:**

(<http://www.niddk.nih.gov/NutritionDocs.html>).

- **CARDIOLOGY—**

- **WebMedLit : Cardiology Current Journal Articles:**

(<http://www.webmedlit.com/topics/CardioLit.html>);

- **Heart Attack Survival Calculator:**

(<http://www.mei.com/resource/calculator>).

- **CLINICAL DISABILITY—**

- **Social Security Impairments by Organ System:**

(<http://www.ohsu.edu/clinweb/disability/adult.html>).

- **CLINICAL-ETHNIC MEDICINE—**

- **EthnoMed: Home Page of Cultural Medicine:**

(<http://www.hslib.washington.edu/clinical/ethnomed/>).

- **Rural Care Health Care Workers:**

([majordomo@freud.apa.org](mailto:majordomo@freud.apa.org));

- **Paediatric Critical Care Home Page:**

(<http://PedsCCM.wustl.edu/>).

- **DERMATOLOGY—**

- **Dermatology Times:**

(<http://www.modernmedicine.com/derm/index.html>);

- **Dermatology Online Journal:**

(<http://matrix.ucdavis.edu/DOJ.html>);

- **Internet Dermatology Society:**

(<http://www.telemedicine.org/IDS.htm>);

- **Skin Cancer and Benign Tumor Image Atlas:**

(<http://www.meddean.luc.edu/lumen/MedEd/medicine/dermatology/content.htm>);

- **Doctor's Guide to Dermatologic Disorders Conferences:**

(<http://www.pslgroup.com/dg/derma.htm>).

- **EMERGENCY MEDICINE—**

**Emergency Medicine Reviews for Primary Care:**

(<http://www.rn.cphu.edu/libraries/resources/reviews/er.htm>);

- **EMBBBS Emergency Medicine WWW:**

(<http://www.embbs.com/>).

- **ENDOCRINOLOGY—**

**Endocrinology Reviews for Primary Care:**

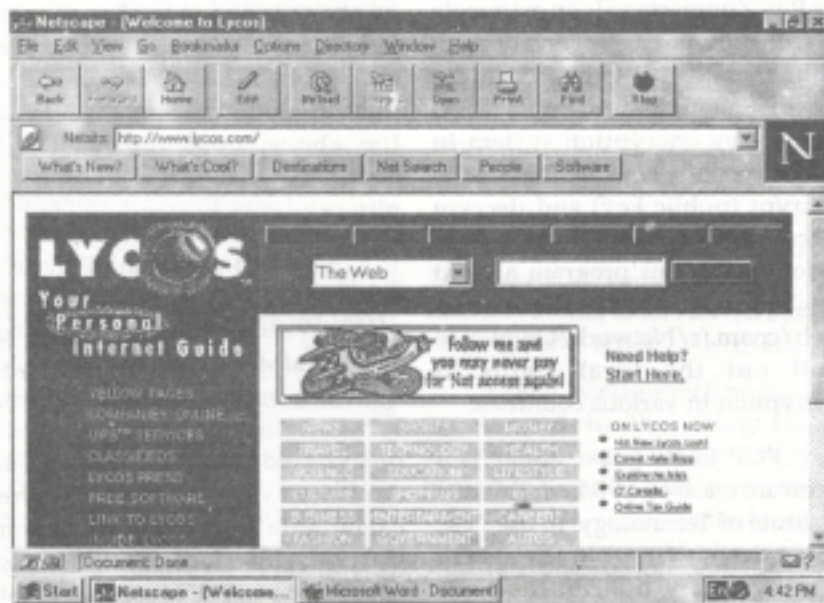
(<http://www.mcphu.edu/libraries/resources/reviews/endo.htm>);

- **Diabetes Care Journal:**

(<http://204.153.205.153/magazine/diabetescare/>).

- **ENVIRONMENTAL MEDICINE-**

**1992 Merck Manual: Poisoning, Bites, & Stings:**



(<http://www.merck.com/!!qt3OX21Eaq3SY3wPl/pubs/mmanual/html/immkkgjb.htm>).

• **FAMILY MEDICINE—**

**Journal of Family Practice: Journal Club:**

(<http://www.housecall.com/sponsors/aafp/aafp.front.htm>).

• **GERIATRICS—**

**Geriatrics:**

(<http://www.modernmedicine.com/gen/about.html>).

• **GYNAECOLOGY—**

**Obgyn.net:**

(<http://www.obgyn.net/>).

• **HEMATOLOGY—**

**Hematology Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/heme.htm>).

• **IMMUNOLOGY—**

**Allergy and Immunology Primary Care Reviews:**

(<http://www.mcphu.edu/libraries/resources/reviews/immun.him>).

• **INFECTIOUS DISEASES—**

**Emerging Infectious Diseases at Medscape:**

(<http://www.medscape.com/Clinical/other/BID/public/journal.EID.mhtml>);

**Healthtouch Food Bacterial Diseases Documents:**

(<http://www.healthtouch.com/level1/leaflets/105825/105826.html>).

• **INTERNAL MEDICINE—**

**General Internal Medicine Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/im.htm>);

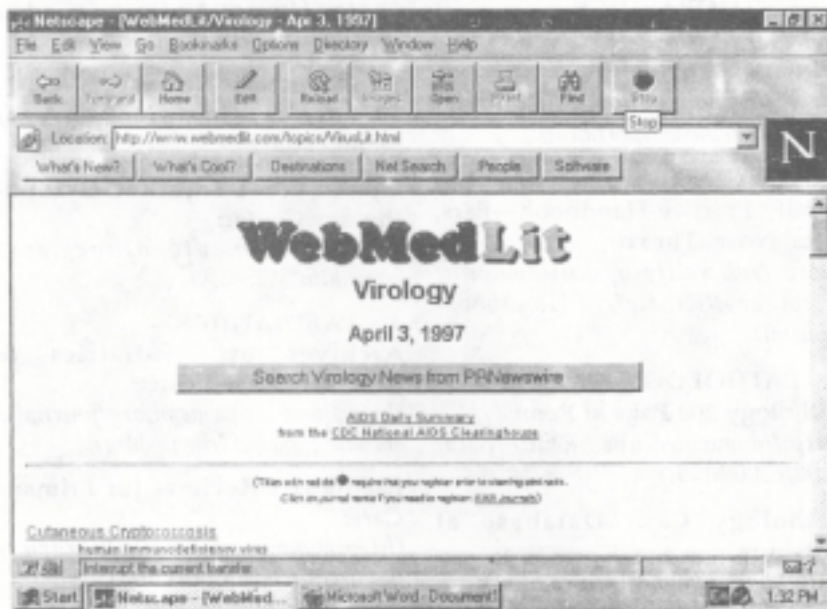
**American College of Physicians: Internal Medicine:**

(<http://www.acponline.org>).

• **METABOLIC MEDICINE—**

**Nutrition and Metabolic Diseases Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/metab.htm>).



• **NEPHROLOGY—**

**Nephrologists:**

(<http://www.he.net/-brumley/ren1/doctorboard.html>).

• **NEUROLOGY—**

**Alzheimer's News : Articles from the New York Times:**

(<http://nytsyn.com/live/Elderly/>);

**Neuromedical News from Neuro World:**

(<http://www.neurosource.com/neuroworld.html#anchor727806>);

• **NEUROSURGERY—**

**Current Opinion in Neurology:**

(<http://biomednet.com/cgi-bin/members/shwtoc.pl%3FJ:neu>).

**Neurosurgical Internet Resource:**

(<http://sunsite.unc.edu/Neuro/nsites.html>).

• **NUCLEAR MEDICINE—**

**LARG\*Net: Nuclear Medicine Resources:**

(<http://johns.largnet.uwo.ca/nucmed/index.html>).

• **OBSTETRICS—**

**Ultrasound in Early Pregnancy:**

(<http://radiology.creighton.edu/Milestones-Early-Preg-Intr.html>);

**Journal of Obstetrics and Gynecology On-Line:**

([http://www.ccsublishing.com/J\\_obg.htm](http://www.ccsublishing.com/J_obg.htm));

• **OCCUPATIONAL MEDICINE—**

**Occupational Diseases and Poisoning Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/occup.htm>).

• **ONCOLOGY—**

**Internet Global Cancer News at Oncolink:**

(<http://www.oncolink.upenn.edu/new>);

**Cancer—Journal from the American Cancer Society:**

(<http://journals.wiley.com/cancer/>);

**Cancerlit:**

(<http://wwwwic.nci.nih.gov/canlit/canlit.htm>);

**Oncology Online Medical Information:**

(<http://medserv.com>).

• **OPHTHALMOLOGY—**

**Ophthalmology Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/eye.htm>).

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(Contd. from page 245)

• **ORTHOPAEDICS—**

**Sports Med & Orthopaedics Primary Care Reviews:**

(<http://www.mcphu.edu/libraries/resources/reviews/sport.htm>).

• **OTORHINOLARYNGOLOGY—**

**Family Practice Handbook—Ears, Eyes, Nose, Throat:**

(<http://vh.radiology.uiowa.edu/Providers/CHnRef/FPHandbook/12.html>).

• **PATHOLOGY—**

**Pathology 200 Page at Penn:**

(<http://www.med.upenn.edu/~path/p200/p200.html>);

**Pathology Case Database at Pittsburgh:**

(<http://path.upmc.edu/cases.html>);

**Atlas of Hematology at Fujita:**

(<http://www.med.nagoya-u.ac.jp/pathy/Pictures/atlas.html>);

**Atlas of Pathology Slides at Urbana:**

(<http://monera.ncl.ac.uk/md/atlas.html>);

**Pathology Images Hypermedia Archive at Washington:**

(<http://scarlett.wustl.edu/path/images>);

**WebPath : Internet Pathology Laboratory:**

(<http://www-medlib.med.utah.edu/WebPath/webpath.html>);

**Pathology Laboratory Exercises:**

(<http://www-medlib.med.utah.edu/WebPath/LABS/LABMENU.html>);

**WebPath Pathology Images CME:**

(<http://www.afip.mil/cmeiveb/cme.html>);

**Wisconsin General Pathology Medical School Course:**

(<http://www.biostat.wisc.edu/educ/path/path703.html>);

**Pathology 200 Page at Penn:**

(<http://www.med.upenn.edu/~path/p200/p200.html>);

**Pathology Course at Wake Forest:**

(<http://www.bgs.m.wfu.edu/pathology.html>);

**Ed's Pathology Notes:**

(<http://worldmall.eom/erf/lectures.htm>);

**Cytopathnet Internet Cytopathology Center:**

(<http://www.cytopathnet.org/home.htm%23case>).

• **PAEDIATRICS—**

**Archives of Paediatrics & Adolescent Medicine:**

(<http://www.ama-assn.org/journals/standing/ajdc/ajdchome.htm>);

**Paediatrics Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/peds.htm>);

**Pediapedia PaediaMc Imaging Encyclopaedia;**

(<http://indy.radiology.uiowa.edu/Providers/TeachingFiles/PAP/PAPHome.html>);

**Doctor's Guide Paediatrics & Genetics Conferences:**

(<http://ioww.pslgroup.com/dg/paediatry.htm>);

**1992 Merck Manual: Paediatrics and Genetics:**

(<http://www.merck.com/!!qt3OX21Eaqt3SY3wPI/pubs/mmanual/html/jkkggcd.htm>);

**VanJerbilt Paediatric Digital Library:**

(<http://www.mc.vanderbilt.edu/peds/pidl/index.html>);

**Family Practice Handbook—Paediatrics:**

(<http://vh.Radiology.uiowa.edu/Provider-s/ClinRef/FPHandbook/10.html>);

**Paediatric Emergencies Text Reviews:**

(<http://www.mc.vanderbilt.edu/peds/core/emergenc/table.html>);

**Congenital Syndromes and Errors of Metabolism:**

(<http://www.uab.edu/pedinfo/DiseasesCongenital.html>).

• **PHARMACOTHERAPEUTICS— Newly Approved Drug Therapies at Centerwatch:**

(<http://www.centenoatch.com/DRUGLIST.HTM>);

**WorldPharmaWeb:**

(<http://www.worldpharmaweb.com>);

**Pharmacotherapeutics Primary Care Reviews:**

(<http://www.mcphu.edu/libraries/resources/reviews/pharm.htm>);

**Pharminfonet Pharmaceutical Information:**

(<http://pharminfo.com>);

**MD Drugs at SilverPlatter:**

(<http://php2.silverplatter.com/physicians/md-drugs.htm>);

**Healthtouch:**

([http://www.healthtouch.com/levell/p\\_dri.htm](http://www.healthtouch.com/levell/p_dri.htm));

**Top 200 Prescriptions:**

(<http://www.rxlist.com/top200.htm>);

**Medication Information Index at Cheshire :**

(<http://www.chesliire-med.com/services/plwrm/med-form.cgi>);

**Drug Formulary—Medical College of Wisconsin:**

(<http://www.intmed.mcw.edu/drug.html>);

**Drug Database—Pharmaceutical Information Associates:**

([http://pharminfo.com/drugdb/db\\_mnu.html](http://pharminfo.com/drugdb/db_mnu.html));

**PharmInfoNet : Diseases and Indications List:**

([http://pharminfo.com/disease/disdb\\_mnu.html](http://pharminfo.com/disease/disdb_mnu.html));

**RxList Internet : Drug-Name-Category Cross Index:**

(<http://www.rxlist.com>);

**Clinical Pharmacology Guide to Common Drugs:**

(<http://www.gsm.com/resources/>

ponline/);

**Doctor's Guide to Clinical Pharmacology Conferences:**

(<http://www.pslgroup.com/dg/clinpharm.htm>);

**1992 Merck Manual Pharmacotherapeutics:**

(<http://www.merck.com/Hqt3OX21Eaqt3SY3wPI/pubs/mmanual/html/imknkdbg.htm>).

• **PREVENTIVE MEDICINE—Prevention & Health Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/prevent.htm>);

**Guide to Clinical Preventive Services 1996:**

(<http://158.7220.10/pubs/guidecps/>);

**The CDC Prevention Guidelines Database:**

(<http://wonder.cdc.gov/wonder/prevguid/prevguid.html>);

**Clinical Handbook of Preventive Services:**

(<http://indy.radiology.uiowa.edu/Providers/ClinGuide/PreventionPractice/TableOfContents.html>);

**Healthtouch Immunization Documents:**

(<http://www.healthtouch.com/levell/leaflets/105825/105886.htm>).

• **PSYCHIATRY—**

**Archives of General Psychiatry:**

(<http://www.ama-assn.org/journals/standing/psyc/psychomehtm>);

**Psychiatry Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/psych.htm>);

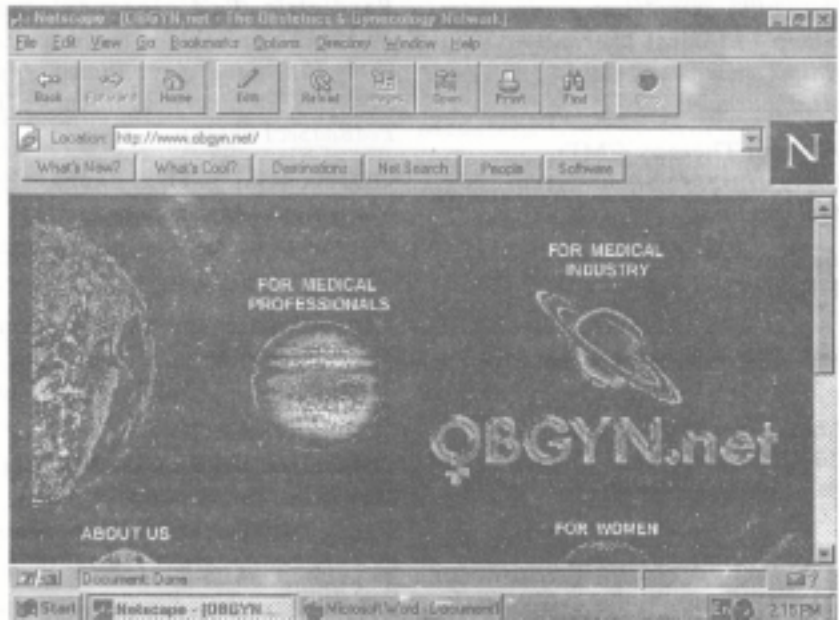
**Mental Health & Nervous Diseases at PharmInfoNet:**

([http://pharminfo.com/disease/mental\\_db.html](http://pharminfo.com/disease/mental_db.html));

**Internet Mental Health:**

(<http://www.mentalhealth.com/>);

**Mental Health Net:**



(<http://www.mhnet.org/>);

**Doctor's Guide to Psychiatric:**

(<http://www.pslgroup.com/dg/psychiatry.htm>);

**Family Practice Handbook—Psychiatry:**

(<http://indy.radiology.uiowa.edu/Providers/ClinRef/FPHandbook/15.html>);

**1992 Merck Manual: Psychiatric Disorders:**

(<http://www.merck.com/!qt3OX21Eaqt3SY3wPI/pubs/mmanual/html/mpnjkhdb.htm>).

• **PUBLIC HEALTH—**

**Public Health Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/commun.htm>);

**Centers for Disease Control and Prevention WWW Server:**

(<http://www.cdc.gov/>);

**Pulmology and Critical Care Primary Care Reviews:**

(<http://www.mcphu.edu/libraries/resources/reviews/pulm.htm>);

**Respiratory Disease Center at PharmInfoNet:**

(<http://pharminto.com/disease/respirdb.html>);

**Doctor's Guide to Pulmonary disorders Conferences:**

(<http://www.pslgroup.com/dg/pulmonary.htm>);

**1992 Merck Manual: Pulmonary Disorders:**

(<http://www.merck.com/!qt3OX21Eaqt3SY3wPI/pubs/mmanual/html/qmhkfdjh.htm>);

**Thoracic Diseases Multimedia Textbook:**

(<http://indy.radiology.uiowa.edu/Providers/Textbooks/rad/ITTR/ITTR.html>);

**Family Practice Handbook—Pulmonary Medicine:**

(<http://vh.radiology.uiowa.edu/Providers/ClinRef/FPHandbook/03.html>);

**Lung Diseases Multimedia Textbook:**

(<http://indy.radiology.uiowa.edu/Providers/Textbooks/rad/books/DiffuseLung/DiffuseLung.html>);

**Chorus Respiratory System Hypertext Documents :**

(<http://chorus.rad.mcw.edu/index/3.html>);

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(Contd. from page 247)

**Sleep—Medical Journal:**

(<http://www-leland.stanford.edu/dept/sleep/journal/>);

**Asthma Therapy CME:**

(<http://pressconf.housecall.com/prologin.html>);

**Asthma Articles at the New England Journal:**

(<http://www.nejm.org/collections/asthma/TOC/1.htm>);

**Practice Parameters for Management of Asthma:**

(<http://www.cmh.edu/allergy/JCAAL/Param/Asthma.HTM>).

• **RADIOLOGY—**

**Diagnostic Imaging Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/rays.htm>);

**Radiology Webserver at Washington:**

(<http://www.rad.ivashington.edu/>);

**Laurie Imaging Center Radiology Image Files:**

(<http://130.2i9.15.246/>);

**Virtual Radiological Case Database in Homburg:**

(<http://radserv.med-rz.uni-sb.de/en.index.html>);

**EMBBS Radiology Teaching Library:**

(<http://www.embbs.com/xray/xr.html>);

**BrighamRAD Diagnostic Radiology Files at Harvard:**

(<http://www.med.harvard.edu/BWHRad/Education.html>);

**Paediatric Radiology Files at Virtual Hospital:**

(<http://indy.radiology.mowa.edu/Providers/TeachingFiles/PedRadSecTF/PedRadSecTF.html>);

**Differential Diagnosis in Musculoskeletal Imaging:**

(<http://www.rad.washington.edu/Books/Approach/TitlePage.html>);

**Radiographic Anatomy for Medical Students:**

(<http://www.scar.rad.ivashington.edu/RadAnatomy.html>);

**CME Case Studies in Thoracic Medicine:**

(<http://vh.radiology.uiowa.edu/Providers/Simulations/ATS/ATS.html>);

**Tutorials in Cardio-Thoracic Radiology:**

(<http://www.sbu.ac.uk/~dirt/museum/g-topics.html>).

• **RHEUMATOLOGY—Rheumatology Reviews for Primary Care:**

(<http://www.mcphu.edu/libraries/resources/reviews/rheum.htm>);

**Unknown Musculoskeletal Radiology Cases:**

(<http://www.rad.ivashington.edu/BoneCaseList.html>);

**Differential Diagnosis in Musculoskeletal Imaging:**

(<http://weber.it-washington.edu:80/~bonejnt/>)

**Rheumatoid Arthritis Multimedia Teaching Module:**

(<http://www.duq.edu/PT/RA/TableOfContents.html>);

**Doctor's Guide to Musculoskeletal Conferences:**

(<http://www.pslgroutp.com/dg/niusculo.htm>);

**1992 Merck Manual Musculoskeletal Disorders:**

(<http://www.merck.com/!!qt3OX21Eaqt3SY3wPI/pubs/mmnniial/html/goidlei.htm>);

**Iowa Family Practice Handbook—Rheumatology:**

(<http://indy.radiology.uiowa.edu/Providers/ClinRef/FPHandbook/06.html>).

• **PRESCRIPTION ASSISTANCE RESOURCES—**

**PDR Online Drug Database:**

(<http://www.pdrnet.com>);

**Clinical Pharmacology Guide to Common Drugs:**

(<http://www.gsm.com/resources/cponline/>);

**Drug Database at Pharmaceutical Information Association:**

([http://pharminfo.com/drugdb/db\\_mnuu.html](http://pharminfo.com/drugdb/db_mnuu.html));

**Drug Formulary at Medical College of Wisconsin:**

(<http://www.intmed.mcw.edu/drug.html>).

• **SIGNS AND SYMPTOMS—Pain Research & Management:**

([http://www.pulsus.com/pain/01\\_01/contents.htm](http://www.pulsus.com/pain/01_01/contents.htm)).

**Searching health care web sites**

Health care professionals can retrieve plenty of information on various subjects such as AIDS, emergency medicine, geriatrics, orthopaedics and rehabilitation, preventive medicine, public health, rural medicine, transplant medicine and travel medicine available on many web sites (see box items).

Specialised areas such as Telemedicine, Imaging and Computing can also be looked upon. Health care professionals can also become a part of various discussion forums of their interest and can exchange their experience. Information on higher education in medical sciences such as information about medical schools,

post graduate medical education in different universities of world and the admission criteria, even the prospectus of some of universities, Job opportunities in different hospitals and research Institutes, etc can also be found out. Literature search on a particular topic in commercial databases such as MHDLINE, Embase, BIOSIS, etc as

• **SPORTS MEDICINE—**  
**The Physician and Sportsmedicine Online:**  
(<http://www.physsportsmed.com>);

**Sports Med & Orthopaedics Reviews for Primary Care:**  
(<http://www.mcphii.edu/libraries/resources/reviews/sport.htm>);

**MedWeb Sports Medicine:**  
(<http://www.gen.emory.edu/mediueb/mediueb.sportsmed.html>).

• **SURGERY—**  
**Medscape Surgery Articles:**  
(<http://www.medscape.com/Home/Medscape-Surg/Medscape-Surg.html>);

**Archives of Surgery:**  
(<http://www.ama-assn.org/joitrnals/standing/surg/surghome.htm> General);

**Surgery Reviews for Primary Care:**  
(<http://www.mcphn.edu/libraries/resources/reviews/surg.htm>);

**Family Practice Handbook—**  
**General Surgery:**  
(<http://indy.radiology.uiowa.edu/Providers/ClinRef/FPHandbook/09.html>);

**Annals of Thoracic Surgery:**  
(<http://www.sts.org/annals/>);

**Society of Thoracic Surgeons:**  
(<http://www.sts.org/>);

**Vascular Thoracic Manual:**  
(<http://dacc.uchicago.edu/library/manuals/vtmanual/tocmanual.html>).

• **TOXICOLOGY—**  
**Clinical Toxicology Resource:**  
(<http://www.pitt.edu/~martint/ivelcome.htm>);

**Toxikon Multimedia Project:**  
(<http://toxikon.uih.uic.edu/toxikon/>);

**Doctor's Guide to Poisoning Conferences:**  
(<http://www.pslgroup.com/dg/poison.htm>).

• **TRAUMA MEDICINE—**  
**Trauma Org:**  
(<http://www.trauma.org/trauma.html>);

**Traumaand Critical Care Resources:**  
(<http://www.trauma.lsumc.edu/htmls/Hotlisttcc.html>);

**Advanced Trauma Life Support Protocols:**  
(<http://www.trauma.org/resus/atls.html>);

**Emergency and Trauma Cases and Teaching Files:**  
(<http://www.geocities.com/HotSprings/2255/smergency.html>);

**Traumabank:**  
(<http://www.trauma.org/traumabank.html>).

• **TRAVEL MEDICINE—**  
**Centers for Disease Control and Prevention WWW Server:**  
(<http://www.cdc.gov/>);

**Centers for Disease Control Travel Health:**  
(<http://uuiwu.cdc.gov/travel/travel.html>).

• **TRANSPLANT MEDICINE—**  
**MedWeb Transplantation:**  
(<http://www.gen.emory.edu/medweb/mediueb.transplant.html>);

**TransWeb: Transplant Information for Professionals:**

([http://www.med.umich.edu.80/trans/transiueb/prof2\\_index.html](http://www.med.umich.edu.80/trans/transiueb/prof2_index.html)).

• **UROLOGY—**  
**Medscape Urology Articles:**  
(<http://www.medscape.com/Home/Medscape-Uro/Medscape-Uro.html>);

**Urology Reviews for Primary Care:**  
(<http://www.mcphu.edu/libraries/resources/reviews/uro.htm>);

**Uroradiology Tutorial on Congenital Anomalies:**  
(<http://cpmcnet.columbia.edu/dept/radiology/TUTORIAL/index.html>);

**Doctor's Guide to Genitourinary Conferences:**  
(<http://www.pslgroup.com/dg/genitou.htm>);

**Chorus Genito-urinary System Hypertext Documents:**  
(<http://chorus.rad.mcw.edu/index/5.html>);

**1992 Merck Manual: Genitourinary Disorders:**  
(<http://www.merck.com/!!qt3OX21Eaq3SY3wPI/pubs/mmanual/html/kngikfjd.htm>);

**Family Practice Handbook—**  
**Genitourinary System:**  
(<http://indy.radiology.uiowa.edu/Providers/ClinRef/FPHandbook/11.html>);

**Prostate Cancer Current Clinical Reviews:**  
(<http://www.comed.com/Prostate/clinrevs.html>).

well as on free Web sites. Full Text journals of various societies are now available on Internet. Health care professionals can also get information on health workers, societies and hospitals, health care companies and on health care management and policy. Even a large amount of information on patient care, education and support

is available. In a nutshell, information related to any aspects of health care is available on Internet.

Health care professionals can query a database in four different ways: (1) by seeking known reference ; (2) asking for an exhaustive list of relevant material

to review the literature ; (3) list of first quality recent references to answer a practical question; and (4) those of a more exploratory browsing nature that may gain a new direction through what is found. They used to search library catalogues, CD-ROM databases and then on-line databases provided by

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**Specialised areas such as telemedicine, imaging and computing can also be looked upon. Health care professionals can also become a part of various discussion forums of their interest and can exchange their experience.**

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different database providers and hosts. For CD-ROM and especially for on-line database searches they used to depend heavily on information specialists or intermediaries for their information requirements. WWW is widely used by health care professionals by themselves without any intermediaries. With the increasing popularity of the Web, some on-line services are abandoning their direct dial services or pairing them with direct access over the Web. Health care professionals apart from using Archie, Gopher, FTP and Telnet can make use of various search engines, directories, e-mail addresses, etc. A brief discussion of these tools is given below.

**SEARCH ENGINES:** Web search engines create a detailed record of the Web using automated software agents—the spiders. The spiders crawl in the public area of the Web, from one web site to another site and record the addresses. While choosing a search engine search features like Boolean operators (AND OR NOT ), keyword as well as phrase/proximity searching, precision and recall ratio, retrieval display options, search set manipulations and truncation, etc are required. Some of the commonly used search engines are:

**(a) Alta Vista (Digital Equipment Corporation):** (<http://altavista.digital.com/>) Altavista is a database of more than 21 million Web pages containing more than eight billion words and 456 GB index. Articles from more than 13,000 Usenet news groups are also available for searching. It has got simple as well as advanced search options. Simple search does not support Boolean operators, but uses a combination of syntax to indicate phrases,/proximity. Advanced search uses operators and expression syntax to construct queries. The binary operators AND, OR, NEAR, and the unary operator NOT are used to combine words and phrases. The operators can also be written in lower case. Alternatively other symbols (&) for AND , (/) for OR, (!) for NOT and (- ) for NEAR can be used. Advance search options make it better than that of Lycos or Open Text search engines as far as search query is concerned. Alta Vista does present a 'date filter range' for its result, a feature none of the other search engines provides. When searched on the Pulse polio programme , 67 Web sites were retrieved. Search was entered as:

*pulse and polio and programme*

10 out of 67 Web sites retrieved were found relevant. One of the web sites retrieved was as follows:

**THE HINDU ON LINE: Stage set to cripple polio?**

Go to : /Weekly edition/THE HINDU Main Menu/ Stage set to cripple polio?Date: 04-12-1995::

Pg:15 :: Col: a. Cl:Medicine from Our Special...

<http://www.webpage.com/hindu/951209/18/0415a.html> - size 5k - 13 Dec 95

**(b) Lycos (Lycos Inc.)**  
(<http://www.lycos.com/>)

Lycos has 19 million unique URLs and 2.3 billion words. Uniqueness of Lycos lies in its having a large number of binary files in its database including GIF, MPEG, JPEG files. The search engines retrieve the search results in the form of relevance ranking. The rankings are determined by location of words in the document. A key word located in title or header receives a higher ranking than a keyword located in document text. Some of the search tips are: Use the minus (-) symbol to create a 'not' search. Use a period (.) after a keyword to have an exact match. (Enter pulse, to find pulse, but not pulses, pulsating, etc). Use a dollar sign (\$) when entering a word fragment. Lycos is best when you need to cast a wide net but when trying to find something quickly is not the best choice. While searching on the topic *Pulse Polio Programme*, in advance searching only one web site was retrieved and was found relevant, but if we broaden our search strategy, searching for *pulse polio* only we get much more Web sites.

**(c) InfoSeek (InfoSeek Corporation)**  
(<http://guide.infoseek.com/>)

InfoSeek Guide is one of the smartest search tools. About one million pages are stored in InfoSeek so far. The full text of each page in the InfoSeek guide database is indexed. Users can make use of its collection of Web pages, news groups, InfoSeek FTP, and Gopher sites. Search engine software of InfoSeek is case sensitive. Capitalised words force a search exclusively for capitalised instances of that word. InfoSeek has a number of advanced search features. Some

## Medical journals on internet

**JAMA Homepage (American Medical Association):**

(<http://www.ama-assn.org/public/journals/jama/jamahome.htm>);

**New England Journal of Medicine On-line:**

(<http://www.nejm.org/>);

**British Medical Journal Abstracts:**

(<http://www.bmj.com/bmj/>);

**Modern Medicine:**

(<http://www.modernmedicine.com/modem/index.htm>);

**MD Digest from Silverplatter:**

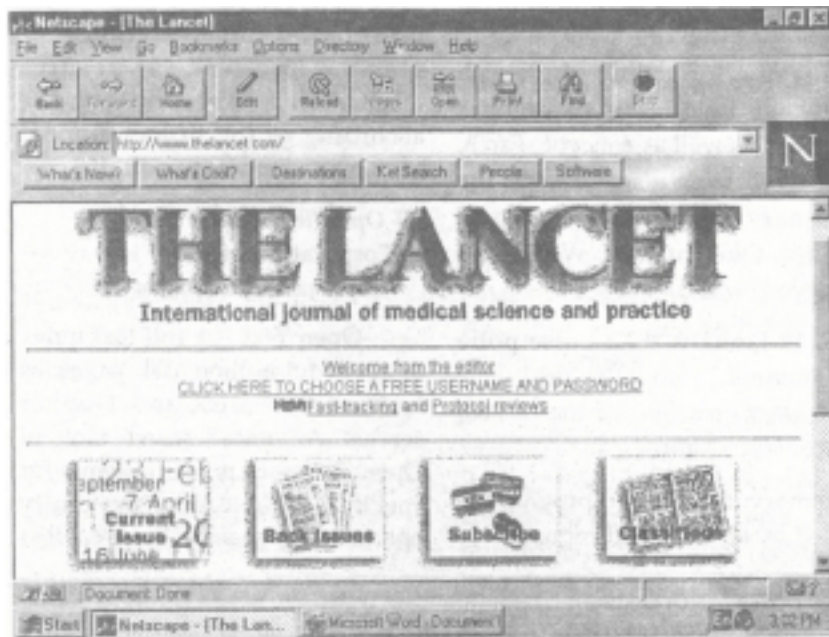
(<http://php2.silverplatter.com/physicians/digest.htm>);

**Medis Medi-Search Primary Care Reviews:**

(<http://www.mcphu.edu/libraries/resources/reviews/>);

**Canadian Medical Association Journal :**

(<http://www.cma.ca/journals/cmaj>);



**The Lancet:**

(<http://www.thelancet.com>);

**Medical Journal of Australia:**

(<http://www.library.usyd.edu.au/MJA>);

**BioMedNet Journals:**

(<http://biomednet.com/>);

**British Medical Journal Full Text:**

(<http://biomednet.com/cgi-bin/members1/shwtoc.pl?%3FJ:bmj>);

**WebMedLit Medical Article Links:**

(<http://www.webmedlit.com/>).

of the advanced search features are : use plus (+) sign for word or phrase; use bracket around word to retrieve those words near each other in any order; use hyphen (-) between words to retrieve those words very close to each other; use double quotation (" ") marks to find words that appear next to each other. Search result that InfoSeek displays are the most complete of any search engines tested. It includes the title of the web page, its URL, a relevancy score, size of the file and a computer generated summary. For example when retrieving the search result on the topic *Pulse Polio Programme*, search was entered as:

*pulse-polio-programme*

13 references were found and all of them were found relevant.

**(d) Excite (Architext Software)**

(<http://www.excite.com/>)

Excite is the most useful, smart and user friendly database. It contains about 1.5 million Web sites, 60,000 categorised Web site reviews and thousands of recent Usenet postings. Excite uses simple as well as advance search methods. Uniqueness of the Excite advance search methods lies, in its doing keyword as well as concept searches. In concept searches when you search for 'Dog care' excite knows that 'Pet grooming' is a related topic and find pages about this too, even if the words 'dog' and

'care' are not actually on the page. Some of the salient features of advance search methods are: Use plus (+) sign before the word if you want an exact word to be retrieved. For example if you want to search 'pulse polio programme' in database it will be entered like '+polio+pulse+programme'. Use minus (-) sign directly in front of a word if we want to search for +polio-pulse, you will be spared the polio related documents that emphasize pulse. Boolean operators AND, OR, AND NOT and parentheses can also be used while formulating the search strategy. When searched on Pulse polio programme, the search was entered as: +pulse+polio+programme

54 web sites were found, out of which 45 web sites were relevant. The reason for getting more web sites may be due to its doing a keyword as well as concept search. The web sites also provide the summary, a unique feature of excite. One of the Web sites retrieved was :

**87% 19 January 1997: Pulse polio programme...** [more like this]  
**URL:** <http://www.timesofindia.com:80/190197/mbon2.htm>

**Summary:** Pulse polio programme hailed by all By a staff reporter

MUMBAI: The second phase of the pulse polio immunisation programme received a positive response from citizens on Saturday, according to the Brihanmumbai Municipal Corporation (BMC).

(e) **Open Text (Open Text Corporation of water loo):**  
(<http://www.opentext.com>)

Open Text is a full text index of about 1.5 million Web pages, as well as FTP sites and Gopher servers. Advanced search tools of Open Text uses pop up menus for specifying Boolean or proximity operators for searching. Open Text

database cover every word on every page it indexes. If you want to search 'foot and mouth diseases' it will search retrieve the relevant document as compared to most of other search engines, except, Alta Vista. It is because Open Text indexing software indexes every word of each Web sites. When searched for information on Pulse polio programme we could find only one web site which also was not relevant.

Some other search engines are:

(f) **WWW WORM** : (<http://www.cs.colorado.edu/www/>)

(g) **WEB CRAWLER** : (<http://www.webcrawler.com/>)

**Table 1. Web Search Engines**  
**(JW LABS COMPARISON CHART)**

	<i>Alia vista</i>	<i>Excite</i>	<i>InfoSeek Guide</i>	Lycos	<i>Open Text</i>	<i>WebCrawler</i>	<i>WWW Worm</i>
<b>DATABASE</b>							
Type & Magnitude of contents	Full Text of over 21 millions Web pages	Full Text of about 1.5 million Web pages	Full Text of about 1 million Web pages	Summaries of over 19 million Web pages	Full Text of about about 1.5 million Web pages	Full Text of about 515,000 Web pages	URLs and titles of about 3 million Web pages
FTP sites included ?	no	no	no	yes	yes	yes	no
Gopher sites included?	no	no	no	yes	yes	yes	yes
Newsgroup included?	yes	yes	yes	no	no	no	no
<b>SEARCHING</b>							
Can refine search results?	no	no	yes	no	yes	no	no
Case-sensitive searching?	yes	no	yes	no	no	no	no
Advanced /enhanced search?	yes	no	no	yes	yes	no	no
Uses Boolean or similar operators?	yes	no	no	yes*	yes	yes*	yes*
Descriptions display with results?	yes	yes	yes	yes	yes	no	no
<b>EXTENDED FEATURES</b>							
Offers directory of Web sites by category?	no	yes	yes	yes	no	no	no
Saves search results as bookmark?	yes	no	yes	yes	no	yes	no
Offers reviews of Web sites?	no	yes	yes	yes	no	no	no

\*AND,OR only

(h) **INKTOMI** : (<http://inktomi.berkeley.edu/query.html>).

All the search utilities work in the similar fashion in two parts: the indexer and the search engine. The indexer examines the complete database—that is all the HTML, ASCII or other documents on Web sites—and creates a file (often called source) that acts as an index or table of contents for the complete data. When a user asks it to locate a certain term, the search engine looks for it to locate in the source, which is more efficient than attempting to search the entire site. The source usually includes a list of every word in the database, where they are and how many time they are used. A comparison of different search engines is given in *Table 1*.

**DIRECTORIES** : Directories are registries of Web sites based on descriptions submitted by web masters or written by directory's staff. Directories give a list of different subject categories from where one can choose a subject of choice and go deep in order to find specific information. One of the most popular and largely used directory is (a) **yahoo** (<http://www.yahoo.com>). One can select the subject Health and can search his topic of interest. Apart from Yahoo other directories and their web sites, which can be used by health care professionals are:

(b) **McKinley's Magellan Internet Directory** (<http://magellan.mckinlay.com>)

(c) **Point Com:** (<http://www.pointcom.com>)

(d) **Excite Netdirectory:** (<http://www.excite.com/subject/>)

(e) **Apollo:** (<http://apollo.co.uk>)

(f) **The Yellow Pages:** (<http://Theyellowpages.com>)

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**Health care professionals are going to be benefitted by VRML as they can see the complicated operation being undertaken in real time environment.**

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**E-mail addresses**

Millions of internet e-mail addresses are searchable through interfaces such as Infospace (<http://www.infospace.com>), whowhere (<http://www.whowhere.com>), Four 11 (<http://www/four11.com>), and Lookup (<http://www/lookup.com/lookup/search.html>), etc. These e-mail addresses will be of great help for health care professionals as they provide information on not only the e-mail address of professionals of their fields but also can find their phone numbers as well as their addresses. E-mail addresses can be registered free of cost.

**Indian scenario**

Although the concept of internet is almost 25 years old, its commercialization started only around 3-5 years ago. But in India the growth of Internet is rather slow. As such we have a bare 1% of visitors. Growth of Internet in India has been slow largely because of the high cost of connectivity to Internet as compared to Indian standards. However, India is fairly up-to-date as far as technology and information are concerned. A number of Indian Newspapers, Magazines, databases are available on Internet.

**Internet connections:** National Informatics Centre (NIC) is the pioneer in setting up a C-WEB (Centre for World Wide Web Service over NICNET). C-WEB is first web server in the country to navigate through Internet for exchanging

multimedia documents between computer users internationally. The WWW Gateway to Internet provides a powerful browsing and searching facility for a seamless world-wide digital web of information. NICNET has now weaved the entire country into single communication entity for reaching out to the world at large without technical barriers.

NIC provides internet access to more than 100,000 users over 200 international networks in 160 countries and has a dedicated internet access through a high speed link. NIC is providing Internet access to research and education institutions under Research and Educational networks of NIC (RENNIC). The other important Internet access providers in India are as follows :

ERNET provides access to Internet having more than 50000 users in 600 organizations and provide access to about 120 networks in other countries.

SOFTNET set up by Software Technology Park of India (STPI) in association with SatCom services India, promises maximum uptime and robust access to software exporters to communicate with their overseas clients without going through VSNL.

Health care professionals can take connectivity from any one of the above Internet access providers.

**Future of WWW**

Java, an object oriented programming language for creating applications which can be embedded in Web pages as applets. Applets are compiled into byte code on the server and can run on the

client side when the browser accesses them.

Virtual Reality Modelling Language (VRML) which can be used to describe 3D objects and animation that can be displayed on a web browser for the user to navigate in the virtual world. More information on VRML can be found at VRMLs primary WWW site:

<http://www.vrml.wired.com>

Health care professionals are going to be benefitted by VRML as they can see the complicated operation being undertaken in real time environment.

### Conclusion

In cyberspace, the new idea is that the general public—at last has the access to online digital information. Few years ago the idea of general public access to the Internet was unimaginable.

At the threshold of 1997, moving closer to the goal of 'Health for all by the year 2000 AD', India's progress in this direction warrants a closer look. The health scenario of past year remained gloomy, jolted with violent attacks of several epidemics with unfortunate consequences. Internet will provide a solution to managing the information explosion arising out of this.

Internet which allows instant transmission of text and graphics and permits talking via computers is the ideal medium for sharing medical expertise. It can be used to save life timely, help doctors when faced by complicated cases by taking the advice of the doctors on the net, facilitate an exchange of ideas which could well lead to valuable innovations and discoveries. Interaction in

cyberspace could also help to keep Indian doctors, who feel rather isolated in touch with new developments.

In future Internet will revolutionize the ways of health care operators of varied disciplines.

### Acknowledgement

The authors are thankful to Mr. S.P Rastogi, Sr. Technical Director, NIC for his inspiration and encouragement and also to our colleagues for their constant help.

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