

WEB-BASED DIGITAL RESOURCES FOR SMALL ANIMAL MEDICINE PROFESSIONALS

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ABSTRACT

The Internet which is also known as 'Information Superhighway', 'Global Information Infrastructure', 'Cyberspace', 'Hyperspace' etc., connects millions of computers in a web and makes almost immediate communication possible, irrespective of the location of its users. The Internet provides huge resources that are useful for veterinary and animal science professionals and the amount of accessible veterinary medicine information is increasing rapidly. Ideally, this could provide a formidable opportunity for Veterinarians to exchange and process veterinary medicine information with colleagues around the world from their desktop. Though the Internet offers virtually unlimited amount of information related to small animal medicine and surgery and provides a number of tools to access, it is useful in at least three aspects related to veterinary medicine and surgery viz., communication, education and research.

Keywords: Internet, World Wide Web, Veterinary science, Small animal medicine, Veterinary surgery

THE INTERNET: A COMMUNICATION TOOL

As a communication tool the Internet helps veterinary practitioners in remote locations to consult with specialists which will help them to improve their skills. It can also be used for various forms of digital meetings. The following are some of the services/facilities offered by the Internet for effective communication of veterinary medical knowledge.

Electronic mail (e-mail)

Veterinary practitioners in remote locations may use e-mail to consult with subject matter specialists through which the general practitioner can improve their skills. Documents such as case histories could be attached to the messages. This type of communication known as 'telemedicine' in the medical practice, which implies the transmission of medical information at a distance, could be applied in veterinary practice as well. There are hundreds of free web-based e-mail service providers on the Information Superhighway like Yahoo (http://mail.yahoo.com), Rediffmail (http://www.rediffmail.com), Gmail, (http://www.gmail.com), etc., through which Vets can create their own e-mail address to join the Information superhighway.

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Mailing Lists

A Mailing List is simply an electronic mail address that redistributes its mail to other addresses. It is a way to reach a few, a few dozen, or a few thousand people who are interested in a specific field/topic. People who are interested in a particular discipline/topic can 'subscribe' to a list(s) deal(s) with that. When someone sends mail to the mail list, the message is redistributed via e-mail to the list's subscribers. Thus, mailing lists facilitate communication among a group of people with similar interest. Those who want to know the mailing lists related to particular subject/topic, can log on to www.lsoft.com which provides a searchable database of mailing lists available on the Internet. The Internet provides a number of mailing lists concerned with small animal medicine and surgery. A few are listed below in Table-1.

Name of the Mailing List To Join this list, send an e-mail to Sl. No. 1 Companion Animal Veterinary listproc@ucdavis.edu Medicine Faculty List 2 Purebred Canines prebred_canines-subscribe@egroup.com 3 Blind Dogs blinddogs-subscribe@yahoogroups.com Deaf Dogs deafdogs-subscribe@onelist.com 4 5 Diabetic Dogs majordomo@esosoft.com Canine Genetics listserv@listserv.iupui.edu 6 listserv@apple.ease.lsoft.com Epilepsy in Canines majordomo@listservice.net 8 Holistic Veterinary Care 9 Kennel Management listserv@peach.ease.lsoft.com 10 Fanciers List http://groups.yahoo.com/group/fanciershealth/

Table-1: A Select List of Mailing Lists

Newsgroup

A newsgroup is an online discussion group, kind of like a bulletin board, where we can post a comment, and someone else posts a comment about 'our' comment, and so on. The newsgroups give us contact with millions of people around the world who have common interest and passions. A select list of newsgroups related to small animal medicine and surgery are furnished in Table-2.

Sl. No.	Name of the Mailing List	Newsgroup
1	Veterinary medicine & animal health	alt.med.veterinary
2	Feline/Human conversations	rec.pets.cats.community
3	Dog Health problems & Care	rec.pets.dogs.health
4	Pet Lovers' Forum	pnet.pets.talk
5	Breed rescue, placing and adopting	rec.pets.dogs.rescue
6	General Feline Topics	rec.pets.cats.misc
7	Dog Breeds	rec.pets.dogs.breeds
8	Feline Health and Behaviour	rec.pets.cats.health+behave

Table-2: A Select List of Newsgroups

INTERNET: AN EDUCATIONAL TOOL

The Internet has, and is, changing higher education. It started quietly enough with the origins of the Internet in supporting research and defence, but now has become much more influential throughout academe. It is exciting, stimulating and offers untold opportunities for faculties and students. Virtually all segments of the university community are using the Internet, including faculty, administrators, and students as it offers educational material integrating text, photos, sounds and video clips. Faculty roles in higher education traditionally encompass teaching, research, scholarship and service. In all of these areas, the Internet has a presence. Therefore, faculty members are using the Internet to support a variety of courses and teaching functions. Few faculty members are offering even the entire course via the Internet. Further, a large number of newsgroups provide a forum for discussion of issues related to veterinary education where veterinary medicine students and faculty members have the opportunity to exchange messages with their peers all over the world, contribute useful discussion, and to publish electronically by writing occasional articles or newsletters. The newsgroups can be identified by searching over any general purpose search engines like Yahoo or Google.

Small animal medicine and surgery oriented resources are appearing on the Internet at a rate that may exceed few other categories. The subjects and data available cover the full range of veterinary medicine are available abundantly through many Internet tools and resources viz., Gateway sites, Virtual Libraries, Online Encyclopedia, Online Videos, Online Dictionaries, *etc.* Few resources along with the 'Uniform Resource Locator (URL)' are listed below for information.

Gateway Sites

Largest collections of small animal medicine and surgery related information can be accessed using the Gateway sites like **Vetgate** (http://vetgate.ac.uk), **VetWeb** (http://www.vetweb.com/). Few selected Gateway sites are furnished below.

NetVet Veterinary Resources: It is designed and maintained by Dr.Ken Boschart, a Veterinarian and is alomost a one-stop site for veterinary science information on the Internet. URL: http://netvet.wustl.edu





The Electronic Zoo: Species-wise collection of Web Resources available on the Internet were compiled and made available on this site which is a part of Net Vet gateway site.

URL: http://netvet.wustl.edu/e-zoo.htm

Centre for Veterinary Medicine: The web site of the CVM provides enormous collection of information related to Adverse Drug Reactions, Animal Feeds, Antimicrobial Resistance, Biotechnology, BSE, Current Good Manufacturing Practices (cGMP). Further it provides access to the Green Book. Free Newsletter and News and Events are other features of this site. URL: www.fda.gov/cvm/default.html

Veterinary Information Network: VIN is the first and largest online service for veterinary professionals which provides most comprehensive online resource for veterinarians. Databases, consultation with boarded consultants, and a large selection of accredited online CE courses are the highlights of VIN. Some of the services offered by VIN are fee based, URL: **www.vin.com**

Virtual Libraries

The Virtual Library is the oldest catalog of the web, started by Tim Berners-Lee, the creator of html and the web itself. Unlike commercial catalogs, it is run by a loose confederation of volunteers, who compile pages of key links for particular areas in which they are expert. Even though it is not the biggest index of the web, the Virtual Library pages are widely recognised as being amongst the highest-quality guides to particular sections of the web." A select list of Virtual Library sites concerned with Veterinary Medicine is furnished below.

Sl. No. Name of the Virtual Library URL

1 Veterinary Medicine Virtual Library http://netvet.wustl.edu/vetmed.htm

2 Livestock Virtual Library www.ansi.okstate.edu/library/

3 Poultry Science Virtual Library http://posc.tamu.edu/library/dother.html

Table-3: A Select List of Virtual Libraries

Online Encyclopedia, Manuals, Videos, Dictionaries and E-Books

The Internet provides enormous collection of web resources packed with online encyclopedia, manuals, videos, dictionaries and so on which are highly useful for the students, faculties and researchers in the field of Veterinary and Animal Sciences. A few of them are highlighted subsequently.

Farm Animal Encyclopedia: It is an excellent encyclopedia with texts, images and video clips related to farm animals. Available at www.depts.ttu.edu/liru_afs/EFAB/default.asp

An **Encyclopedia of Canine Veterinary Medical Information** is available at http://www.vetinfo.com/dencyclopedia/deindex.html

Emergency Medical Manual: The Manual provides detailed information related to cardiac arrest, chemical burns, choking, electrocution/electrical shock, external bleeding, fractures, frostbite, heatstroke, hypothermia, ingested toxins, internal bleeding, moving an injured cat/dog, snakebite, shock and thermal (heat) burns. The manual can be accessed at http://drlarrypetvet.com/health manual.html

Veterinary Videos: The site facilitates access to 59 videos from this site on various aspects of veterinary practice viz., Physical Examination, Blood Sample Collection, Chest Tube Placement, Intramuscular Injections, Subcutaneous Injections, Milking and Mastitis Testing, etc. Access the videos at **www.vet.ohio-state.edu/1238.htm**

Veterinary Abbreviations & Acronyms: This site focuses on abbreviations and acronyms commonly used in veterinary practice and supplements the standard and widely available reference sources such as Gale's *Acronyms, Initialisms & Abbreviations Dictionary*. It is intended for use by veterinary students, researchers, practitioners, and librarians. The site can be logged on at **www.library.uiuc.edu/vex/vetdocs/abbreviation.htm** Another Veterinary Glossary which can be very much useful for the Vets is available at **http://www.vetmed.wsu.edu/glossary/glossary.asp**

Online Dissection: The On-line Cat Dissection is the premiere online resource for cat dissection. This site facilitates to dissect a cat, learn about multiple features of its anatomy, and then test our skills on the material we learned. Teachers can also print out worksheets and other materials. The site facilitates veterinarians to do online dissection of cat from their desktop. Vets can try online dissection at http://library.thinkquest.org/15401/?tqskip1=1&tqtime=0828

Software: Free software are also available on the cyberspace for the use of Vets. The 'Canine/Feline Genetics Software' is an example. This software can model the genetics of some 30+ congenital defects where the mode of inheritance is known, such as PRA (both forms), PKD, flat chestedness and many others and compute the expressed color/pattern that will result from a given genotype. For further details, please log on to http://www.tenset.co.uk/catgen/indexus.html

Online Decision Support Tool: CONSULTANT is a 'Diagnostic Support System for Veterinary Medicine'. It is supported by a database consisting of approximately 500 signs/symptoms, about 7,000 diagnoses/causes, and about 18,000 literature references including 3000 web references. It suggests possible diagnoses or causes for clinical signs and symptoms and provides a brief synopsis of the diagnosis/cause including (1) a general description, (2) species affected (3) the signs/ symptoms associated with it; and (4) a list of recent literature references. URL: www.vet.cornell.edu/consultant/consult.asp

E-books: Veterinarians can download the full-text of a number of useful books related to veterinary medicine from the Internet without paying anything. Books like 'Canine and Feline Geriatrics', 'Feline and Canine Infectious Diseases', 'Cardiorespiratory diseases of the Dog and Cat', 'Equine Cardiology', 'Clinical Veterinary Toxicology', etc. The books can be downloaded from http://www.provet.co.uk/

Small Animal Disease Information Resources

The Internet provides enormous web resources related to small animal diseases which are absolutely essential for practicing small animal veterinarians. For example, the *Provet* (http://www.provet.co.uk/) provides daily 'Clinical Updates' for Vets and 'Pet Fact' topics for pet owners plus searchable database of animal health information. Disease specific web resources are also available over the cyberspace. A select list of such web resources are furnished below.

Canine Diseases

• A – Z: Canine Diseases

URL: http://vetmedicine.about.com/cs/dogdiseasesa/a/dogaz.htm

• Brucellosis in Dogs

URL: http://www.vetinfo.com/dencyclopedia/debrucel.html

• Canine Bloat

URL: http://personal.uncc.edu/jvanoate/k9/bloatfaq.htm

• Canine Dermatology

URL: http://www.nzymes.com/Articles/dog_skin_hair_problems.htm

URL: http://www.petshealth.com/dr_library/dogskin.html

• Canine Diabetes

URL: http://www.vetinfo.com/ddiabt.html

• Canine Epilepsy

URL: http://www.canine-epilepsy.net

• Canine Geriatrics

URL: http://www.srdogs.com/Pages/care.fr.html

• Canine Hip Dysplasia

URL: http://www.petsurgery.com/caninehipdysplasia.html

URL: URL: http://www.gcvs.com/surgery/hip_dysplasia.htm

URL: http://workingdogs.com/doc0090.htm

URL: http://www.canismajor.com/dog/pennhip1.html

Canine Hypoadrenocorticism

URL: http://informatics.vetmed.vt.edu/novartis/percorten.html

• Canine Influenza in Dogs

• URL: Canine Perianal Fistulas

URL: http://www.geocities.com/Heartland/Pointe/1672/

• Canine Inherited Disorders

URL: http://www.canismajor.com/dog/genetic1.html

URL: http://www.grca.org/acquiring.htm#hereditary

• Canine Nephrology & Urology

URL: http://www.geocities.com/Vienna/Opera/2167/

URL: http://www.petshealth.com/dr_library/caninekidney.html

URL: http://www.marvistavet.com/html/body_pyometra.html

• Canine Oncology

URL: http://www.labbies.com/cancerintro.htm

URL: http://www.vetinfo.com/dogcancer.html

URL: http://personal.uncc.edu/jvanoate/k9/k9lympho.htm

• Canine Ophthalmology

URL: http://www.animalevecare.net/

URL: http://www.petshealth.com/dr_library/eyedog.html

URL: http://www.blinddogs.com/articles/glaucoma.htm

URL: http://www.vetmed.auburn.edu/dcs/sac/mededu/glaucoma.htm

URL: http://www.amchessieclub.org/aeyedis1.html

URL: http://www.eyevet.info/

• Canine Orthopedics

URL: http://www.offa.org/

URL: http://www.peteducation.com/category_summary.cfm?cls=2&cat=1569

• Canine Perianal Fistulas

URL: http://www.geocities.com/Heartland/Pointe/1672/

• Cushing's Syndrome

URL: http://www.vetinfo.com/ddiabt.html

URL: http://www.canismajor.com/dog/cushings.html

URL: http://www.cvm.uiuc.edu/petcolumns/showarticle.cfm?id=108

• Deafness in Dogs

URL: http://www.lsu.edu/deafness/deaf.htm

• Parasites of the Dog

URL: http://www.vetinfo.com/dogpara.html

URL: http://cal.vet.upenn.edu/dxendopar/parasitelists/pdlist.html

URL: http://www.profferskennel.com/health.htm

URL: http://www.peteducation.com/category_summary.cfm?cls=2&cat=1619

• Parvo Virus Infection

URL: http://www.peteducation.com/article.cfm?cls=2&cat=1556&articleid=467

• Seizures in Dogs

URL: http://italiangreyhound.org/health/seizure.html

Feline Diseases

• A – Z: Feline Diseases

URL: http://vetmedicine.about.com/cs/catdiseasesa/a/catsaz.htm

• Allergic problems of Cats

URL: http://www.vetinfo.com/callergy.html

• Bones, Muscles and Nerves Diseases of Cats

URL: http://lbah.com/whats_your_diagnosis.html#normal

• Endocrine Diseases in Cats

URL: http://www.maxshouse.com/Endocrine System & Disorders.htm

• Feline Asthma

URL: http://www.winnfelinehealth.org/health/asthma.html

URL: http://www.marvistavet.com/html/body feline asthma.html

URL: http://www.vetinfo.com/casthma.html

• Feline Cardiology

URL: http://www.vmth.ucdavis.edu/cardio/cases/cases.htm

• Feline Chronic Renal Failure

URL: http://www.hdw-inc.com/healthcrf.htm

URL: http://www.felinecrf.com/

• Feline Dentistry

URL: http://www.peteducation.com/category_summary.cfm?cls=1&cat=1371

URL: http://www.winnfelinehealth.org/health/dental.html

URL: http://www.cvm.uiuc.edu/petcolumns/showarticle.cfm?id=100

• Feline Dermatology

URL: http://www.vetinfo.com/catskin.html

URL: http://www.nzymes.com/Articles/cat_skin_hair_problems.htm

• Feline Diabetes

URL: http://www.felinediabetes.com/

URL: http://www.vetinfo.com/cdiabetes.html

URL: http://petdiabetes.org/

• Feline Geriatrics

URL: http://www.vet.cornell.edu/fhc/resources/brochure/seniorcat.html

URL: http://www.winnfelinehealth.org/health/geriatric-cats.html

URL: http://www.fabcats.org/elderlycats.html

• Feline Heartworm Disease

URL: http://www.vetmed.auburn.edu/fhd/

URL: http://www.heartwormsociety.org/heart.htm

• Feline Hyperthyroidism

URL: http://www.avmi.net/NewFiles/Hyperthyroidism/Hyperthyroidism.html

• Feline Infectious Peritonitis

URL: http://www.dr-addie.com/

• Feline Leukemia Virus

URL: http://www.vet.cornell.edu/fhc/resources/brochure/felv.html

URL: http://www.winnfelinehealth.org/health/FeLV.html

• Feline Nephrology and Urology

URL: http://www.vetsites.vin.com/Kidney/KMJkid.html

• Feline Ophthalmology

URL: http://www.petplace.com/cats/glaucoma-in-cats/page1.aspx

URL: http://www.vetinfo4cats.com/cateye.html

URL:

http://www.vin.com/VINDBPub/SearchPB/Proceedings/PR05000/PR00523.htm

• Feline Panleukopenia

URL: http://www.avma.org/careforanimals/animatedjourneys/pethealth/feline.asp#4

Feline PKD

URL: http://www.felinepkd.com/

• Feline Viral Diseases

URL: http://www.maxshouse.com/viral_diseases.htm

• Parasites of Cats

URL: http://www.vetinfo.com/catpara.html

URL: http://www.peteducation.com/category_summary.cfm?cls=1&cat=1357

URL: http://www.sniksnak.com/cathealth/ringworm.html

URL: http://www.dgp.toronto.edu/people/TabathaHoltz/cats/medical/worms.html

URL: http://www.vet.cornell.edu/fhc/resources/brochure/parasite.html

• Toxoplasmosis in Cats

URL: http://www.vet.cornell.edu/fhc/resources/brochure/toxo.html

URL: http://www.fabcats.org/toxoplasmosis.html

• Tumors and Cancers in Cats

URL: http://www.nzymes.com/Articles/cat_skin_hair_problems.htm

URL: http://www.oncolink.com/types/article.cfm?c=22&s=69&ss=545&id=6019

• Urinary System Diseases in Cats

URL: http://www.vet.cornell.edu/fhc/resources/brochure/urinary.html

URL: http://www.peteducation.com/category_summary.cfm?cls=1&cat=1372

URL: http://www.winnfelinehealth.org/health/urinary-obstructions.html

INTERNET: AS A RESEARCH TOOL

As a research tool, the Internet helps for communication and collaboration. It makes easy to exchange information, such as data or to develop research programmes or to collaborate with the authors of papers. Immediate access to databases such as MEDLINE / Genome Database and various Online / Electronic journals is helpful to researchers. Few selected resources are listed below for information.

Databases

A variety of databases which are useful for Vets available over the Internet *viz.*, PUBMED, MEDLINE, etc. In addition to these databases, few more databases are also available. The College of Veterinary Medicine, Washington State University provides an excellent Image database exclusively for Vets. The images in this data base are for educational, non-commercial use only. Many of these images are intended for use by animal health care students and professionals and show animals with naturally occurring diseases. URL: http://imagedb.vetmed.wsu.edu

The Canine Inherited Disorders Database provides useful information for veterinarians looking for current information on both well-known and more obscure genetic disorders, including diagnostic and therapeutic information. The database is available at http://www.upei.ca/~cidd/intro.htm

Electronic Journals, Conference Proceedings, E-Theses, etc.

Electronic Journals (e-journals), Conference proceedings and Theses are publications that are distributed online rather than in traditional formats like printed journals. Publishing a printed magazine is an expensive and laborious process, but e-journals are inexpensive to create and distribute. Therefore, most of the publishers are started publishing e-journals and most electronic journals are free. Here are some of the important gateway sites which facilitate access to free full-text journals, Conference proceedings and E-Theses.

Directory of Open Access Journal: This service covers free, full text, quality controlled scientific and scholarly journals. We aim to cover all subjects and languages. There are now 2098 journals in the directory. Currently 567 journals are searchable at article level. As of today 90710 articles are included in the DOAJ service. The DOAJ provides access to 35 journals concerned with animal science. URL: http://www.doaj.org

High Wire Press: HighWire Press, a division of the Stanford University Libraries, hosts the largest repository of free, full-text, peer-reviewed content, with 922 journals and 1,216,783 free, full-text articles online. With their partner publishers they produce 73 of the 200 most-frequently-cited journals. URL **http://highwire.stanford.edu/**

Free Medical Journals: The web site offers full-text access to 1450 scholarly Journals which includes Basic Sciences (99), Biochemistry (7), Biology (21), Lab Medicine (4), Pharmacology (25), Pharmacy (36), Public Health (77), Toxicology (9), Trop Medicine (6), and Veterinary Medicine (19). URL: **www.freemedicaljournals.com**

Free E-Journals: The site provides access to over 100 Open Access journals covering all areas of Biology and Medicine URL: www.biomedcentral.com/browse/journals/

Table of Contents of Veterinary Journals: The site Produced by Jean-Paul Jette, Faculty of Veterinary Medicine, Montreal University, facilitates Vets to browse TOC of individual titles by alphabetical order of the Title and Content pages of around 600 Veterinary Journals published worldwide. URL: **www.medvet.umontreal.ca** /biblio/vetjr.html

Conference Proceedings Database: The site facilitates Vets to access the Table of contents, some abstracts, some full-text articles of various national and international conferences, Seminars & other important events. URL: www.medvet.umontreal.ca/biblio/conf.htm

E-Theses: Most of the universities in developed countries publish the thesis in electronic format to facilitate global access. E-Theses can be accessed and downloaded through a number of web sites *viz. http://www.ndltd.org*, http://www.ohiolink.edu/etd/, http://wwwlib.umi.com/dissertations/,etc

Further, the Internet facilitates veterinarians to contact the Librarians of Veterinary Libraries across the globe to cater to their information requirements by providing the contact details at http://homepage.usask.ca/~kfl094/vet_libraries.html

INTERNET: EMERGING CHALLENGES

The information on the Internet is not necessarily accurate, correct, complete or reliable. The issue is especially critical for both human and animal health information.

Therefore, the Vets should be very careful while consulting the Internet to cater to their professional information requirements. They should always consider the following:

Site Ownership
Currency
Audience
Perspective
Content
Authorship of Conten

It is always better to make use of evaluated web resources as the quality of web sites is a problem in cyberspace. Most of the professional bodies related to small animal medicine and surgery have web sites of their own which are packed with useful technical information and links to other useful web resources.

A select list of web sites of professional bodies/associations concerned with small animal medicine and surgery are listed in Table-4 for the benefit of small animal practitioners.

Sl. No. Name of the Professional Body Uniform Resource Locator (URL) 1 American Association of Feline http://www.avma.org/aafp/ **Practitioners** 2 American Animal Hospital Association http://www.healthypet.com http://www.acsma.com 3 American Canine Sports Medicine Association http://www.vmth.ucdavis.edu/acvim 4 American College of Vety. Internal Medicine http://www.bsava.ac.uk 5 British Small Animal Veterinary Association http://www.agri.huji.ac.il/~hylton/ 6 European College of Veterinary Internal ecvim/ecvim.htm Medicine Companion Animal http://web.ukonline.co.uk/fab/esfm.html 7 European Society of Feline Medicine http://www.petsforum.com/PIJAC/ 8 Pet Industry Joint Advisory Council

Table-4: A Select List of Web Sites of Professional Bodies

CONCLUSION

The exponential growth of the Internet offers veterinarians access to a vast amount of information regarding animal health care, as well as opportunities for networking, education, publishing, and entrepreneurial activity. Veterinarians will benefit from using a focused search strategy, such as gateway sites or subject indexed search sites, to find accurate information that most closely addresses their concern. Though numerous excellent small animal health care sites are available to benefit veterinarians, we have selected and reviewed a key set of such sites. It is needless to say that the Internet is moving ahead at rapid speed and efforts to facilitate access to reliable, high-quality information about animal health care on the Internet must keep pace.

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