The Virtual Hospital: Creating and Organizing a Ubiquitous Health Sciences Organization on the Internet

Michael P. D'Alessandro M.D.[1,2], Jeffrey R. Galvin M.D.[1], William E. Erkonen M.D.[1], David L. Lacey M.D.[1], David S. Curry M.S.L.S [3], Edwin A. Holtum M.S. [3], Donna M. Santer M.D.[4]

[1] Electric Differential Multimedia Laboratory, Department of Radiology, University of Iowa College of Medicine, Iowa City, IA, [2] Department of Radiology, Children's Hospital and Harvard Medical School, Boston, MA, [3] Hardin Library for the Health Sciences, University of Iowa, Iowa City, IA, [4] Division of General Pediatrics, Children's Hospital and Harvard Medical School, Boston, MA

Introduction

A physical organization is defined by its physical plant, the people who work within it, the knowledge they contain and the services they offer. A ubiquitous organization is a digital representation of the information and services of a physical organization that is made available to anyone at any time in any place. Creating a ubiquitous organization amplifies the attributes of the physical organization by extending its power and reach. Now, instead of people having to come to the physical organization for information and services, the ubiquitous organization comes to them whenever they need it.

Ubiquitous organizations can be created for physical organizations such as governments, libraries, schools, universities, and hospitals. We have created a ubiquitous organization which we call the Virtual Hospital which is a digital representation of the University of Iowa Health Sciences Colleges, Library, and Hospitals and Clinics. The Virtual Hospital contains digital representations of key medical center services which are continuously available at a distance, thereby serving as an efficient medical center extension.

Discussion

The Virtual Hospital therefore serves as a digital health sciences library for Iowa and the world. It contains information of use to patients and health sciences practitioners. The information contained within the Virtual Hospital may be used by health sciences practitioners at the time of patient contact to aid patient care or it may be used as continuing education material at a time and place that is convenient for the practitioner. It is now well recognized that our concept of education is changing. Universities need to focus on building life long learners, and must teach their students how to learn. In order to maintain their skills throughout a lifetime of practice, the health sciences practitioner must always be "in training." This continuum of training requires a continuum of information and this will be the function of the Virtual Hospital, providing an electronic umbilical to the practitioner throughout their career. By lowering the threshold for obtaining high quality medical information by putting information at their fingertips, health sciences practitioners may practice "just in time learning," which is the acquisition and review of information at the time it is needed, just before or during a patient encounter, when it will have the greatest impact on patient care and thereby improve the quality of medical care rendered unto patients.

Patient information in the Virtual Hospital includes "The Iowa Health Book" - a compilation of patient education and preventive medicine information, a Health Care Providers Directory for the University of Iowa Hospitals and Clinics (UIHC) to help patients choose a health care provider, and Post-Visit Follow-up and Home Care Instructions. Information in the Virtual Hospital for Health Sciences Students and Practitioners includes multimedia textbooks, teaching files, patient simulations, and diagnostic algorithms, access to the UIHC Informm patient information database, access to MEDLINE and other electronic resources at the Hardin Health Sciences Library, and Continuing Education materials including grand rounds, conferences and lectures.

The Virtual Hospital is constructed upon 4 computer software, hardware and communication standards which are all in the public domain: (1) The World Wide Web (WWW), a hypermedia client/server database technology, is used to organize the Virtual Hospital, (2) Wide Area Information Servers (WAIS), a client/server indexing and searching tool, is used to index the content within the Virtual Hospital, (3) The Internet, the data superhighway of today, is used to transmit the content of the Virtual Hospital to its users, (4) Mosaic, a client for the WWW and WAIS which is available for all popular personal computers and workstations, is used to display the information contained in the Virtual Hospital.

Connecting to the Virtual Hospital

Once connected to the Internet with a Mosaic client, set your Uniform Resource Locator (URL) to: http://vh.radiology.uiowa.edu/. If you do not have Mosaic, but you do have a communications program that can emulate a VT-100 terminal you may connect using the telnet command to log into the host "lemans.radiology.uiowa.edu" and then when prompted with "login:" type "lynx" and you will be on the Virtual Hospital Home Page.

Reference

[1]. Galvin JR, D'Alessandro MP, Erkonen WE, Knutson TA, Lacey DL. The Virtual Hospital: A New Paradigm for Lifelong Learning in Radiology. Radiographics 1994; 14:875-879.