

Health Sciences Initiative

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"It is VA's intent and priority to maximize its enterprise network by transforming it from a utility to a true service delivery mechanism supporting the critical mission of serving the country's veterans. Internet2 is an optimal enabling platform that will allow the applications that support this mission to be tested and rolled out efficiently and effectively."

— Steve Pirzchalski, Director
Enterprise Transport Services,
U.S. Department of Veterans
Affairs

Circuit-riding doctors are riding a different type of circuit nowadays. Health science professionals, medical researchers and educators are collaborating across the miles—and borders—by way of high-performance, optical circuits. From rural clinic to research hospital to laboratory, advanced networking applications are drastically changing the landscape of modern-day medicine.

To help its member community traverse this rapidly changing health networking landscape, the Internet2 **Health Sciences Initiative**:

- Facilitates the creation and enhancement of health applications not feasible using traditional Internet technology.
- Promotes the development of health tools and resources that take advantage of Internet2 advanced network services and seed the long-term distributed growth of healthcare and life sciences applications.
- Collaborates with other health sciences associations and the Internet community to identify guidelines for secure and effective networking.
- Works with Internet2 members, initiatives, working groups and partnerships to develop technologies and apply solutions to the medical domain.
- Informs the health sciences community through collaborative demonstrations at regional, national and international levels.

Extending healthcare connectivity

Efforts have recently focused on extending connectivity and clinical practice into underserved rural areas through the **FCC Rural Health Care Pilot Program**. The program helps public and nonprofit healthcare providers construct state- and region-wide

broadband networks to provide telehealth services throughout the nation. Many of the program's funding recipients already are—or soon will be—connected to the Internet2 Network. The program will fund up to 85% of network upgrade, Internet2 connection and advanced network services costs for selected recipients. A special **Health Network Initiative** has been established to facilitate the expansion efforts and to help this growing community of healthcare providers join forces with the Internet2 health sciences community.



▲ Dr. Roy Soetikno and VA Palo Alto team showed how remote, high-definition video images can be used to determine pre-cancerous diagnoses. (Photo courtesy Veterans Affairs)

Extending clinical practice

The U.S. Department of Veterans Affairs (VA), an Internet2 affiliate member, is actively involved in a number of Health Network Initiative working groups, and is counting on advanced telehealth technologies to improve healthcare for the country's honored veterans—including those located in rural areas.

The VA hopes to deliver a whole range of medical services over Internet2's next-generation network. A current focus area is clinical practice, as underlined by a live demonstration presented by Internet2 and the VA at the 2009 Internet2 Spring Member Meeting. A high-definition, "just like being there" telepresence session allowed a psychiatrist located at the Arlington, Virginia,

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hotel to simulate a patient encounter with a “wounded warrior” hundreds of miles away in Cambridge, Massachusetts. The psychiatrist was able to use medical information from two independent medical record systems using resources developed by the Office of the National Coordinator for Health Information Technology and the Federal Health Architecture.

In another recent demonstration, Dr. Roy Soetikno and a team from Veterans Affairs Palo Alto Hospital used the Stanford University Internet2 Network connection to conduct a teleteaching session and used subtleties in video images to point out a precancerous diagnosis where it might have been missed in the past. Now the diagnosis can be made remotely, using high-definition video and high-bandwidth communications.

The Johns Hopkins Center for Clinical Global Health Education (CCGHE) is already using similar technology to fulfill its mission by delivering expertise interactively around the world—without steep travel expenses or long interruptions in providers’ work schedules. Besides lively medical debate through high-quality videoconferencing, the connection enables analysis of high-resolution microscopy, three-dimensional MRIs and interactive representations of HIV drug resistance. The CCGHE holds monthly interactive HIV clinical case discussions which are webcast live and archived for study.

surgery, taking telemedicine to the next level.” The team’s goal is to transfer the technology to medical education and actual diagnostic applications, reducing the cost and enhancing the quality of patient care.

Extending research

The Internet2 Health Sciences Initiative is also collaborating with external health organizations and other Internet2 initiatives to advance health research. A current effort involves the Federal Health Architecture (FHA), the National Cancer Institute (NCI) Cancer Biomedical Informatics Grid (caBIG) and other federal agencies, and supports the exchange of health information for research, educational and clinical purposes. The caBIG project aims to improve patient outcomes through the creation of a collaborative information network. The FHA, which includes caBIG and more than 20 other agencies, has pooled member resources to create the CONNECT Gateway, an “on ramp” to the Nationwide Health Information Network (NHIN). The CONNECT Gateway supports the exchange of a wide variety of documents and data types. The Health Sciences Initiative is working with caBig to add services to CONNECT that will enable the handling of the extremely large datasets used by research institutions.

Also on the research front, the Health Sciences Initiative recently participated in planning a National Institutes of Health National Center for Research Resources (NCRR) conference on the future of telehealth. The program brought together stakeholders from government, academic, healthcare and technology institutions to review the state of telehealth technology, identify gaps to be addressed through targeted research initiatives, and explore opportunities to use evolving technologies to advance the field.

Extending health science advances to everyone

Patients often miss out on health science advances because of the significant barriers to participation they face. The Internet2 Health Sciences community is determined to overcome those barriers by helping researchers, providers and patients communicate and share information independent of distance and time.

▶
An endoscopic surgery, broadcast from the University of Puerto Rico to multiple U.S. locations via high-quality, real-time video and multipoint videoconference. (Photo courtesy of Gurcharan S. Khanna, RIT)



Extending education and training

A team led by the University of Puerto Rico School of Medicine recently conducted a groundbreaking test in cooperation with the Rochester Institute of Technology. An endoscopic surgery at the University of Puerto Rico was broadcast to multiple locations in the United States via high-quality, real-time video over a secure, high-speed network connection. A multipoint videoconference connected to the video stream allowed for live interaction between participants.

Gurcharan Khanna, Director of Research Computing at RIT and a member of the research team, said the test proved “...that by using the speed and advanced protocols support provided by the Internet2 Network, we have the potential to develop real-time, remote consultation and diagnosis during

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