

Telemedicine Bridges Barriers

In Fort Dodge, Iowa, a 73-year-old woman with a history of stroke, spots in front of her eyes, hypertension, and who smoked for 50 years, visited a cardiologist for an ultrasound of her right carotid artery, one of a pair of arteries that carry blood to the brain. Seventy miles away at Iowa Methodist Hospital in Des Moines, conference participants and a vascular surgeon watched the procedure via a teleconference. A large screen on the wall toggled between showing the doctor with the patient and images from the ultrasound, enhanced by color to help define the speed of blood through the artery.

Through this remote vascular imaging, David H. Stubbs, MD, in Des Moines determined that the patient was stable and could be treated on site rather than being referred to a specialized medical center.

The Iowa Methodist session also demonstrated transmission of echocardiograms for a middle-aged man and for twins born weighing only 11/2 pounds each from a hospital in Iowa City to Iowa Methodist, 110 miles away.

In the last year, Iowa Methodist has done 100 such consultations through a sophisticated telecommunications network available throughout the state.

"Whether it's 110, 1,010 or 10,010 miles, it's irrelevant. The distance is no longer insurmountable," said Ginny Wagner, director of information technology, strategic planning and telemedicine for the Iowa Health System. "Telemedicine is the way of the future. It will make life better for our parents, our children, and ourselves over the next few years."

Partners Use Telemedicine for Distance Learning and Consultation

Iowa's telecommunications network incorporates many of the same technologies partners are using to diagnose patients and increase their knowledge of areas from emergency medicine to radiology.

Some partners are taking advantage of teleradiology--transmission of X-rays, magnetic resonance images and ultrasounds via phone lines. In addition to bridging distance, teleradiology programs compress files, allowing far less expensive storage than using bulky film.

"In the future, [the practice of] medicine will require more information," said Daniel Schwartzberg, MD, a radiologist at Georgia Baptist Medical Center in Atlanta, Georgia. "And it will need to be made available for every doctor--not only teleradiologists."

Cable News Network (CNN) in Atlanta reported last year on the progress the St. Petersburg-Atlanta partnership has made with teleradiology, using a program called WinRad (see graphic on page 19), which Schwartzberg helped develop. The technique "allows the distance separating doctors to disappear," Sergei Lapekin, MD, of the Department of Nuclear Medicine at Pavlov Medical Institute in St. Petersburg, told CNN.

Partners are also using new technologies for distance learning.

"Learners remember 10 percent of what is read, 20 percent of what is heard, but 80 percent of what is heard, seen and done. So, teleconferencing can provide an active learning

environment," said Dominic Screnci, EdD, director of the Educational Media Center at the Boston University School of Medicine.

Screnci has put that premise to work in 15 teleconferences between partners in Boston and Yerevan, Armenia. In one session, Yerevan partners transmitted CAT scan images of a patient's head to Boston, where consulting physicians agreed the tumor was benign. Another teleconference connected nurses from all over Armenia with their counterparts in Boston.

In a session last March, EMS personnel viewed a videotape of a 1993 disaster drill. During the teleconference, held to give partners an opportunity to assess the effectiveness of EMS training over three years, still images from the video were captured to highlight what EMS teams were doing right and wrong. The case study allowed the partners to reevaluate and rework their EMS education materials, Screnci said.

"We now deliver information on a number of different fronts," said Anahit Yuzbashian, information coordinator at the Emergency Scientific Medical Center in Yerevan. "We have found that the more people you can inform, the more effect you will have. That has been the driving force behind our teleconferencing program."

Newly installed teleconferencing equipment in Dubna, Russia will facilitate education between partners, said Sandy McCormick, a vice president of Lutheran Hospital in LaCrosse, Wisconsin. McCormick said that she has found many benefits to the technology over e-mail, fax and phone communication: it's a visual, convenient, cost-effective way to teach and learn. It also provides the group with immediate feedback, she said.

McCormick also outlined lessons she's learned from initial teleconferencing: provide as much translation of materials as possible in advance of the videoconference, provide time for both groups to talk, and limit interaction to three hours. In learning to adapt to teaching via the technology, McCormick said it is important to make sure presenters understand how the equipment works and to use large visuals so that those viewing the presentation on the other end can see them clearly.

Other partners who have not yet used the technology are eagerly anticipating opportunities for their hospitals.

"This technology is even new for the United States," pointed out Zakir Kamarli, MD, director of the Institute of Oncology and Radiology in Bishkek, Kyrgyzstan. "We haven't used any of it, but we want everything." Kamarli said he plans to purchase teleradiology software and equipment first.

Cost and Technical Glitches Can Hamper Use

One reason more partners haven't had the opportunity to participate in telemedicine is the cost involved, both for equipment and transmission.

Although Iowa's extensive communications network was financed by the state government and private grants, hospitals in both the NIS and US generally have to find a way to foot the bill. Costs for the Iowa Communications Network can run more than \$100,000 per site, but offer a different array of services than those AIHA partnerships will use.

AIHA's goal in offering technology assistance is to ensure that the ongoing costs are sustainable for partnerships. Each hour of teleconferencing between Dubna and LaCrosse costs \$450, for example, making it a cost-effective alternative to travel. A copy of WinRad has been donated to Pavlov Institute in St. Petersburg. And costs are coming down, Iowa Health

System's Wagner said. Storing and retrieving medical images for later use rather than using live teleconferencing can also cut expenses, she said.

Difficulty with transmission and lack of trained staff to use the equipment can interfere with the effectiveness of telemedicine. Occasional technological problems during the conference--such as glitches with sound or picture on the video screen--were soon corrected.

And while telemedicine seems to have the enthusiastic support of physicians, some practitioners were concerned about acceptance by patients. But to the surprise of some observers, patients surveyed about telemedicine are "delighted," said Wagner. "Some prefer it rather than traveling outside their community. They are fearful of large hospital centers, fearful of isolation from family. Patients feel better when they're not removed from their physician and community."