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Technological Advances Could Change the Face of Telemedicine

Up-and-coming information technologies could have myriad applications in telemedicine. But they first must face some familiar hurdles, experts say.

By Beckie Kelly Schuerenberg, Senior Editor

(December 2002) Catholic Health System uses a virtual private network to enable nonaffiliated radiologists to remotely and securely access its health care information systems. The Buffalo, N.Y.-based delivery system's VPN was designed to help the physicians access radiology images and information to better perform teleradiology services from their offices.

However, implementing and maintaining the complex software and network connections required in such a configuration is wearing on both the delivery system's I.T. department and its radiologists.

"The main limitation with the teleradiology VPN is the complexity of ensuring the software is correctly installed on radiologists' computers and the connection is properly working. It's a big pain," says Doug Torre, director of networking and technical services. "Further, our radiologists don't like that our VPN isn't accessible via the Internet."

Placing a bet

But Catholic Health System is betting a new network technology it's recently deployed will improve information access internally and resolve its teleradiology predicament. The delivery system in October implemented the Instant Virtual Extranet application from Neoteris Inc., Mountain View, Calif.

The software created a level of secure sockets layer technology between Catholic Health System's information systems and the Internet.

This security layer provides internal and remote physicians with secure Web-based access to Catholic Health System's network without adding any extra software or networking technologies to the doctors' PCs, Torre explains. Now, instead of implementing and maintaining VPN technology at each physician office, the delivery system centrally creates user names and passwords to enable clinicians access to applications.

Catholic Health System eventually will offer the technology to its remote radiologists to use for telemedicine services. And the delivery system hopes the instant virtual extranet will enable it to expand its telemedicine services.

"One of our radiologists hates our current VPN because it's so difficult to use. He wants the ability to use a Web browser for teleradiology services," Torre says. "The virtual extranet is a simpler, easier system than our VPN because it helps shift the burden off the physicians and onto the technology."

Like the Instant Virtual Extranet, many new or developing information technologies could have a significant impact on telemedicine. Also like the virtual extranet, many of these technologies—such as

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telemonitoring applications, wireless technologies and increased Internet access speed—are being designed to help expand overall networking capabilities in various industries, including health care.

These technologies could help extend the reach of telemedicine networks and reduce the cost and time required to perform telemedicine services. While the future of these technologies in telemedicine may sound promising, there are several hurdles that prevent health care organizations from fully adopting them. One long-standing hurdle for telemedicine—reimbursement—also is delaying the use of new technologies in the field.

In a nutshell: Medicare and most private insurance companies only reimburse providers for medical care that's delivered face to face. There are some exceptions, primarily teleradiology and telemedical services offered as part of grant programs. Still, this financial barrier leaves provider organizations conducting telemedicine in a lurch.

"It doesn't matter what technologies are introduced for telemedicine if society prohibits health care organizations from using them," says Doug Perednia, president of the Portland, Ore.-based Association of Telehealth Service Providers. "For physicians, telemedicine often requires more time and trouble because of economic barriers. No I.T. will help expand telemedicine services until there are changes in the way the industry—and society—views telemedicine."

Low-cost options

Given the financial difficulties, many telemedicine providers are looking to lower-cost technologies to further their telemedicine efforts, says Jonathan Linkous, executive director of the Washington-based American Telemedicine Association.

Use of low-cost applications that help ease or expand basic telemedicine services—such as teleradiology or teledermatology—will surge soon, Linkous contends.

Technologies such as wireless applications that enable remote cardiac or fetal monitoring also have great potential in telemedicine, he adds. To help drive costs down and increase adoption of such technologies, specialized telemonitoring vendors might integrate their technologies, he speculates.

In the next three to four years, telemonitoring applications will become so inexpensive and standardized that consumers will be able to purchase disposable monitors at their local drugstores, predicts David Balch, director of The Telemedicine Center at East Carolina University, Greenville, N.C.

Another future application for telemonitoring equipment could enable provider organizations to place sensors in cars to monitor passengers' health or direct them to the nearest hospital, he adds.

Such wireless telemonitoring technologies may catch the attention of managed care organizations, who should easily see preventive care and disease management opportunities, some experts say.

These payers could conclude it would ultimately be more cost-effective to reimburse physicians for real-time wireless monitoring that transmits patients' vital signs to a provider's network, says Bob Watson, co-founder of Telemedicine Technologies Co., a Wilson, N.C.-based telemedicine consulting firm.

"In the end, it's difficult for vendors to show telemedicine technologies to physicians because the physicians don't know if they can receive reimbursement when using them," Watson says. "And payer organizations often don't see the positive patient outcomes to be had via telemedicine

technology to make the reimbursement decision.”

But after March Networks sponsored a six-month tele-home care study this year that demonstrated the time and cost savings Web-based wireless telemonitoring can offer, some provider and payer organizations began to take notice, contends Bob Webster, a vice president at the Ottawa, Canada-based vendor.

The study focused on March Networks’ new Home Telehealth Service. Using broadband, Web and wireless technologies, the provider-based service is designed to replicate a nurse’s home care visit. The service enables interactive video, voice and data to be securely transmitted between a patient’s home and a health care organization.

For its part, the study is helping some payers understand that to reduce costs, health care must be delivered differently, Webster contends. Further, other technologies used in the Home Telehealth Service—including wireless devices and broadband Internet connections—also can help improve and extend telemedicine services, Webster predicts.

“Broadband Internet access enables the high-quality video interface needed to deliver better tele-home care,” he says. “It also will help foster the ability to use robotics to remotely manage things like wound care.”

Boosting potential

High-speed Internet access technologies also will boost the potential of telemedicine. The Mayo Clinic, Rochester, Minn., already is turning to high-speed access to expand its telemedicine services.

Implementation of the Mayo Clinic’s high-speed virtual private network to two government-operated hospitals in the United Arab Emirates was delayed for about 18 months. This was done to ensure the highest possible Internet connection speed the Arabian phone company could enable as a backbone for the telemedicine service, says Marvin Mitchell, project manager at the telehealth center at the Mayo Clinic.

The VPN, created by Wellogic, Cambridge, Mass., enables physicians in the United Arab Emirates to exchange images and information with Mayo Clinic physicians for teleconsultations. Previously, the non-U.S. physicians had to mail the patient’s information and fly patients to Mayo’s Minnesota or Florida hospitals for consultations.

Now Mayo’s VPN enables its physicians to spend half the time they did on each conventional consultation. It also has reduced the number of United Arab Emirates patients who must receive face-to-face treatment. As a result, the time and cost savings for both the Mayo Clinic and the United Arab Emirates’ facilities has helped break the traditional financial barriers to telemedicine technology.

“The images and data we’re getting from the United Arab Emirates over the new VPN are significantly better than what we had been receiving in the mail. The image resolution is so much better. It has had a significant impact on their health care,” Mitchell says. “This is going to open up a lot of telemedicine opportunities for us in the future.”

The Mayo Clinic, however, did want access to a faster speed Integrated Services Digital Network, or ISDN, for its telemedicine services. Although the clinic uses its telemedicine network solely for store-and-forward applications, ISDN technology’s higher bandwidth and speed also can enable health care organizations to perform real-time, interactive video applications.

ISDN is the fastest “public” Internet connection

available and will continue to be the backbone of choice for future interactive video telemedicine applications, says Watson of Telemedicine Technologies.

Bundles of joy

Eventually, technologies such as instant messaging could be used in combination with ISDNs or slower networks to send data separate from video. This could reduce the cost of high-bandwidth technologies in future telemedicine applications. But most providers will seek to bundle data transmissions on a single network, Watson predicts.

"Interactive telemedicine applications will stay land-based on ISDN technology because of the Health Insurance Portability and Accountability Act security rule," he says. "It would be complex for provider organizations to secure a transmission over a public high-speed network."

But Perednia of the Association of Telehealth Service Providers disagrees. HIPAA gives a definition to what precautions should be taken to secure data.

If provider organizations encrypt telemedicine data, require user names and passwords for access, and record audit trails, they should meet the HIPAA security requirements, he says.

Further, if they meet these requirements, they should consider their data to be secure over any backbone, including Internet, satellite or Internet Protocol-based VPNs, he adds.

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