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TESTING TOMORROW'S HEALTH CARE – TODAY

by Geoff Daily

It all started with a fiber network. Back in 1993, a corporate foundation dedicated to supporting education in its home town of Winona, Minnesota, decided to connect local schools with fiber optics – one of the first such projects ever built. The fiber network grew to include schools, government offices and health care facilities. Then in 1997, the Luminet not-for-profit network became the for-profit Hiawatha Broadband Communications, which has since extended a hybrid fiber-coax infrastructure to homes and businesses

throughout Winona, becoming the first broadband provider in the country to sell bundled triple-play services. (Recently, the company added a fiber-to-the-home

network in nearby Wabasha, as described in “It’s a Matter of Connecting the Dots – Effectively” in the August, 2006 issue of Broadband Properties.)

During the same period, the Cerner Corporation, a billion-dollar international health IT company, was searching for a community where it could alpha-test an online health service. Cerner’s requirements were simple: a community of less than 50,000 people with a single health care system, a dominant clinic and broadband connections. But while there was no shortage of small communities, Cerner was having trouble finding the right one. As Hiawatha president Gary Evans explains, “everything always broke down

because they didn’t have a broadband network.”

A Match Made by Good Fortune

Evans gained this insight into Cerner’s struggle in 1999, during a chance conference call with Cerner’s CEO, Neal Patterson.

Patterson described Cerner’s desire to field test IQHealth, the company’s new online portal, which enabled in-home access to medical records, educational materials on chronic ill-

nesses, patient-generated health diaries, and contacts with local medical professionals. And Evans – who in addition to heading up Hiawatha Broadband

serves as board chairman for Winona Health, the area’s primary health care provider – described Winona’s position on the leading edge of broadband deployment.

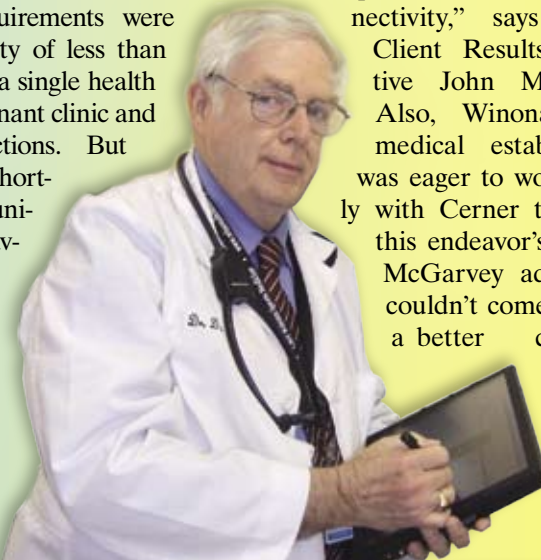
Cerner quickly realized it had found the partner it was looking for. “Out of their population of 30,000,

60 percent had Internet connectivity,” says Cerner

Client Results Executive John McGarvey. Also, Winona’s local medical establishment was eager to work closely with Cerner to ensure this endeavor’s success. McGarvey adds, “We

couldn’t come up with a better combination of having the in-

A rural community builds an advanced broadband infrastructure and becomes a testbed for 21st-century medicine.



frastructure, the community from a healthcare perspective, and the leadership that's in place."

For Winona Health, Hiawatha Broadband and the city of Winona, this relationship presented an opportunity to leverage their network and partner with a major corporation to realize a dream that has now become a reality: Winona Health Online, one of the most advanced, integrated online health management systems in the country.

Step One: Electronic Medical Records

Getting there wasn't a simple matter, however. When Cerner, Winona Health, and Hiawatha set out to implement IQHealth in the spring of 2000, they quickly discovered a problem: In order to populate a personal health record, the patient's medical record first needs to be in digital form. Personal health records, which are generated by patients, are based on electronic medical records, which are generated by health care professionals and contain a full record of illnesses, diagnoses, treatments and more.

"It didn't take long to realize that we had the consumer portal coming in, but what was it going to connect in to?" says Rachelle Schultz, CEO of Winona Health. "We really weren't wired at all.... We realized that we needed to look at the medical record piece first."

So all parties changed course to achieve the larger goal of implementing both an electronic medical record (EMR) and a personal health record system. Over the ensuing months, Cerner set up camp in Winona, moving some of its employees to the area for several months to facilitate better communication. The company also brought Winona Health staff to its Kansas City headquarters for training.

In becoming a testbed for Cerner, Winona Health had the luxury of not needing to worry about connectivity, but it still had to develop familiarity with the new technology. To train physicians and guide Cerner at the same time, the provider designated

a panel of physicians to make sure the features they wanted were incorporated. Working with the physician panel, Cerner tailored the system to meet their needs – for example, crafting templates that enabled physicians to perform common functions with a single keystroke.

Seamless Medical Records

The EMR system that resulted from their efforts allows the seamless transmission of medical records from one medical establishment to another, no matter where the patient is seeking care or has received care in the past.

"Whether you come in through your primary-care doctor, or into the emergency room, or if you're a direct admit into the hospital, your provider can get into your medical records right away and see what's going on, without having to worry about faxing paper charts," Schultz explains. This type of shared electronic medical record avoids gaps in patient care that can come about when patients switch doctors or clinics.

The EMR is integrated into every facet of medical care, pulling in information like doctors' notes and flowsheets, lab results, radiology images and even financial records. "The ICU, our family birth center, our inpatient psychiatric unit...all the various services that we have are part of this electronic medical record," says Schultz. Even the local pharmacies are connected to the system, so doctors can send prescriptions electronically and have them ready for patients to pick up at their convenience.

The aspect of the system most visible to patients is Winona Health Online, the portal where they create and access their personal health records. Through this portal, patients gain access to some or all of their EMR and track information about immunizations, surgeries, allergies, medication, and more. Lab results can even be sent directly to patients through secure messaging.

To help patients manage their health, the portal has a wealth of

information about chronic diseases ranging from diabetes to heart disease to asthma. "The system funnels into their account new information about whatever chronic condition they may have as it becomes available," Evans explains.

Winona Health Online has proven to be a powerful communication and administrative tool for patients and their doctors. Patients use it to schedule in-person or online appointments. They can also share with health professionals the information they log about their health – for example, a diabetic logging glucose readings or dietary information could have a registered dietitian review the diary and alert the physician if anything seems amiss.

The system also has a built-in drug checker that notifies physicians of any potential for adverse drug interactions – an increasingly important safeguard as the number of prescription drugs has jumped from less than a hundred to more than 10,000 over the last 40 years.

Leadership in Health Care

In 2002, Winona Health's Community Memorial Hospital was recognized as one of the top 100 Most Wired Hospitals, and in every year since it has been ranked as one of the Most Wired Small & Rural Hospitals by Hospitals and Health Networks Magazine, the journal of the American Hospital Association.

As a result, Winona Health's leaders have had many opportunities to share what they've learned. "Over those first couple of years, I think we were literally all over the country speaking about the kinds of things we were doing here," says Evans. The organization recently hosted a visit from the Estes Park Institute, which produces educational conferences for health care professionals.


Schultz describes how Cerner benefited from the Winona project: "I think what we really provided them was a lab...a research and development opportunity for their organization to learn how you go into a

smaller community and succeed – because we don't have the 50 people in our IT department you might find in a large system. The scope of everything is just different. So if they were really interested in getting into this size market, they needed to understand it."

The integrated, networked EMR system has meant more efficient medical care, both in terms of timeliness and productivity. "The big difference for our healthcare providers is that they have all the information right there in front of them; you do not have to wait for pieces of paper to float through anymore," says Schultz. "This is very important from the standpoint of it not mattering anymore where a patient has been before, as all the relevant information is right at the provider's fingertips."

With built-in educational materials and patient-generated diaries, Winona Health has tools to help patients manage chronic conditions. "If we can help patients manage their conditions more aggressively at home, we can help them decrease the amount of hospitalization they have to have," Schultz points out.

And this system's impact will only grow over the years. "We're looking now at how to mine the community information to learn how many people have diabetes, how many are suffering from depression, how many are on high blood pressure medication, and so on," says Schultz. "Then we can look at how we might be able to do things outside of our walls that can support these people."

Universal broadband access was what drew Cerner to Winona. But how important is high-speed Internet to an application that is largely data-oriented? "The speed of connectivity is critical," answers McGarvey. "Capturing the attention of patients and consumers is something that has to be simple, has to be fast, and has to be convenient.... [It] would undoubtedly turn people off from using the system if the connectivity were too slow." 

Geoff Daily is the assistant editor of Killer App Magazine. He can be reached at geoffd@killerapp.com.

NEW TELEMEDICINE APPLICATION PROMISES TO REPLACE MANY SKIN BIOPSIES

*by Jay Eastman, Ph.D.,
Chairman and CEO, Lucid Inc.*

Instead of relying on routine surgical biopsies, dermatologists may soon be sharing, reviewing and diagnosing non-invasive digital images of skin cells via the Internet, using Lucid Inc.'s VivaNet telemedicine server and its VivaScope confocal imagers.

Rochester-based Lucid (www.lucid-tech.com) has developed innovative cellular imaging technology and is now leveraging the Internet to securely deliver accurate, real-time cellular resolution images to medical professionals.

Anytime, Anywhere Collaboration

The company's VivaScope confocal microscopes can image living tissue with cellular resolution and – importantly for patients – without the need to excise tissue. The VivaNet server is intended to provide fast, accurate and secure stor-

age, retrieval and transfer of the images across the Internet. The technology is expected to facilitate anytime, anywhere professional collaboration and consultation among medical practitioners and pathologists in forming a clinical judgment for a variety of skin conditions, including skin cancer and other dermatologic conditions.

Just as MRI and CT scans have largely eliminated the need for routine exploratory surgery, in-vivo reflectance confocal microscopy may one day eliminate the need for routine invasive skin biopsy.

A typical VivaScope imaging session produces two types of images of the patient's skin: dermatoscopic-quality, full-color macroscopic pictures and microscopic, cellular resolution images. Once all of the images for a session are completed, the images and pa-

