Regional Medical Center at Lubec

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III. Improving Rural Health Care

Telemedicine, the use of communications technologies to deliver health care services to people at remote locations, has obvious appeal in rural areas, where the population is widely scattered and doctors — especially specialists — are in short supply. TOP has supported a variety of projects designed to make this possibility a reality. The two projects profiled here shed light on two issues. First, they show that telemedicine isn't a single technology; rather, it is a variety of tools — including video-telephones, more sophisticated teleconferencing equipment and space-age units that can monitor everything from pulmonary conditions to blood pressure. More important, these two projects suggest that while technology makes telemedicine possible, human relationships are what make it work.

Initially, the projects appear quite different. In one, a small medical center is spearheading a growing effort to bring better medical care to rural areas. In the other, a major trauma hospital is playing the lead role in improving the practice of emergency medicine in a large rural region. But the projects have more in common than they have differences. In each case, success depends less on technical proficiency than on good will, hard work and a sincere desire to apply technology in a way that benefits everybody.

A Telemedicine Network Takes Shape

Joyce F. sits in her living room in Calais, Maine, and looks at two large bookshelves lined with the pictures of her seven grown children. "They all got an education," she says, with obvious pride. Those pictures are an aging mother's anchor, reminders of who she is and how much she has accomplished in a long life. But her continuing ability to enjoy them in a living room packed with other pictures and memorabilia depends on one other item: a small black box that sits unobtrusively next to the telephone.

It is a videoconferencing device. Connected to a regular telephone line and featuring a monitor about the size of a post-card, it enables Joyce to see and hear a nurse who visits her electronically every day. Though Joyce's voice is frail, the nurse has no trouble hearing her when she calls. In just a few minutes, she sees how Joyce is doing, makes sure she is taking her medicines, and, perhaps, takes some of the loneliness out of Joyce's solitary day.

It may not seem like much, but this link to the outside world has kept Joyce happily in her home longer than anybody would have thought possible. A year ago, the Eastern Area Office on Aging in northeastern Maine had just about concluded that she couldn't manage on her own any more. She suffers from diabetes and first-stage Alzheimers disease, and her ability to follow a

fairly rigorous schedule for taking her medications was in doubt. But the little black box has brought her the help she needs, enabling her to stay in a familiar setting full of reminders of her life. Besides enhancing the quality of her life, that probably has strengthened her in the fight against Alzheimers.

The little black box is one piece of an ambitious telemedicine project that is changing the face of health care in rural Maine. With support from the Technology Opportunities Program, the Regional Medical Center at Lubec has installed equipment that allows nurses from two vast counties in northeastern Maine to make electronic home visits to ailing people who otherwise might have to be institutionalized. At the same time, the medical center has been providing more sophisticated teleconferencing equipment to link specialists in urbanized areas with patients, doctors, and other professionals in smaller, regional medical facilities. Although the project is less than three years old, it is rapidly growing into a statewide network, bringing together not only medical care facilities but also institutions as varied as mental hospitals and law enforcement agencies.

Three Tools

The Regional Medical Center at Lubec didn't exactly set out to build a statewide network. Rather, it perceived a need in its own back yard. "We saw that our own clients were having trouble getting services," says Ken Schmidt, the facility's senior executive officer. Lubec, the easternmost town in the United States, lies on the Maine seacoast in Washington County, an almost entirely wooded expanse of 2,628 square miles that are almost as isolated as they are beautiful. The nearest major hospital and medical specialists are between two and three hours away in Bangor, Maine. The adjacent county, Aroostook County, is the largest county east of the Mississippi — and one of the most rural. With 80,000 people dispersed over 6,400 square miles, it has just 12.5 people per square mile.

Compounding the challenge that distance poses for health-care providers, the region has notoriously severe weather. Aroostook County, for instance, averages 110 inches of snow per year.

In this environment, the simple act of going to see a doctor or nurse can be so arduous that many residents — especially people with chronic illnesses — often fail to make appointments. As in other areas, visiting nurses provide routine health monitoring and care to homebound patients. But with even a single home visit often requiring two or three hours of driving, they are stretched thin. They cannot always keep pace with the demand, especially when patients seek help after hours.

The medical center is using three types of telemedicine tools to help overcome these obstacles. The simplest is the little black box used in homes of patients like Joyce. These patients don't need much; they simply need somebody to check up on them. Some have to be reminded to take their medicines on schedule. "Medication compliance is one of our biggest issues," notes Carol Carew, director of Home Telemedicine for the center. Others need to have wounds inspected to make sure they are healing correctly. Still others need advice on everything from tending to hospice patients to caring for newborn babies. Many of the beneficiaries are psychiatric patients. In a brief telemedicine visit to check whether they are taking their medicines, nurses can look for little clues that something is awry. If a patient answers a call with disheveled hair, for instance, that may be an early indication that his condition is deteriorating. By catching problems and getting help early, nurses are keeping patients at home and out of the hospital.

The center deploys more sophisticated home-based telemedicine units for other patients, including people with heart or pulmonary disease. These devices typically have video screens, tools to read blood pressure and stethoscopes. The stethoscopes, developed to monitor astronauts' hearts from space, actually deliver higher quality readings than a doctor gets listening to a person's heart in-person using a traditional stethoscope. Some home-monitoring stations also have oximeters and glucometers, which measure oxygen saturation and sugar levels in the

blood, respectively. With this array of tools, nurses are monitoring patients with diabetes, chronic heart or respiratory conditions and hypertension. They are checking up on patients just discharged from hospitals following cardiac surgery (a valuable service because insurers are requiring such patients to go home earlier than in the past). Medical center staffers estimate the telemedicine units are reducing costly after-hours visits to patients' homes, emergency room visits by home-care patients and re-hospitalizations by 10 percent.

The third tool in the medical center's arsenal is not even a telemedicine device, strictly speaking. It is a high-speed videoconferencing system that allows specialists in urban areas to consult with patients and other doctors in outlying clinics. Although patients still must travel to larger, urban hospitals for major procedures like surgery or initial psychiatric treatment, videoconferencing enables them to get routine follow-up care in local medical centers nearer to home. It also gives local doctors a great deal of support. They need all the help they can get. Washington and Aroostook Counties have just 76 and 127 physicians per 100,000 residents, respectively (the statewide average in Maine is 175 physicians per 100,000 people). Moreover, these counties have a disproportionate number of new doctors who, by the very nature of their rural practices, have to generalize more than city doctors — and hence, may be less familiar with specific maladies than their urban counterparts.

There is little question that videoconferencing has improved the quality of services to many residents of rural areas. Consider Dr. Charles Alexander, a gerontologist at Maine Coast Memorial Hospital in Ellsworth, Maine. One of his jobs is to evaluate patients suspected of suffering dementia. For rural patients, he traditionally had to settle for reviewing the results of tests that nurses and social workers administered in the patients' homes. But now, these patients can go to rural clinics near their homes, and visit Dr. Alexander via videoconferencing. That approach represents a huge improvement. Patients with dementia and their families have coping mechanisms that can mask the underlying medical problems, according to Dr. Alexander. A spouse, for instance, might almost reflexively answer a difficult question for a confused person — a behavior that may not show up on paper but is readily apparent to a specialist who can observe the patient and his surroundings. "One look is worth a thousand words," says Dr. Alexander.

Teleconferencing has improved the treatment of such patients as well, he adds. Much of the treatment of dementia involves helping families of people who have the disease learn how to deal with stress and to work together to handle the situation. But in today's busy world, it is almost impossible to get entire families to drive many hours to meet with gerontologists like Dr. Alexander. With videoconferencing, however, it is easier to assemble families because they simply have to travel to a local clinic or doctor's office.

Making It Happen

Despite all the arguments in favor of using telemedicine in rural areas, it has not always been an easy sell. Among other obstacles, some visiting nurses believe the aim is to eliminate their jobs, and some rural doctors fear big-city specialists will take away their patients. Managers of the Maine project have gone to considerable lengths to alleviate such concerns. The key, they believe, is to persuade doctors to embrace telemedicine themselves.

As a first step, they strive to demonstrate that doctors needn't feel threatened. "We make it clear we are not trying to break referral patterns," says Carew. The project also recommends putting teleconferencing equipment in specialists' offices, rather than in the hospitals where they practice, so that it will be more convenient for them to use the equipment. But most important, the center enlists doctors to promote use of the equipment with other doctors. Only a doctor can persuade another doctor that telemedicine works, and help assuage concerns doctors might have about malpractice and other issues, suggests Dr. Arvind Patel, the regional center's medical director. "The key to getting doctors on

board is working with them on a peer-to-peer basis," he says. In addition, officials from the medical center are serving on a statewide task force that is exploring other concerns, such as how doctors can be reimbursed for telemedicine visits and how various hospitals can streamline the cumbersome process of granting privileges to doctors who may not be physically present.

While these issues are thorny, there is a growing sense in Maine that telemedicine is the wave of the future — as demonstrated by a growing number of organizations lining up outside the regional center's door seeking help developing their own teleconferencing capabilities. For instance:

- The Maine Department of Mental Health wants to use videoconferencing to improve treatment of people facing emotional crises. Bachelors-degree social workers currently man most rural crisis programs. With videoconferencing, these field workers could consult with psychiatrists on difficult cases.

- Similarly, local sheriffs departments, which frequently are the first authorities to have contact with disturbed individuals, would like to establish electronic links with mental health professionals to facilitate psychiatric evaluations.

- The Department of Mental Health believes teleconferencing could be used to help patients in mental hospitals maintain ties to their communities so that they can assimilate better after they are discharged.

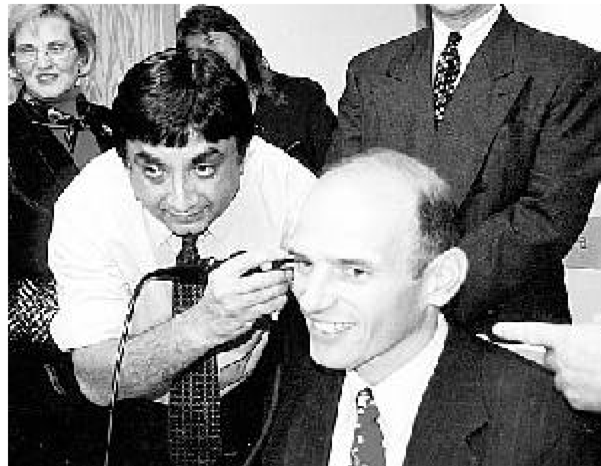
- The state's Department of Corrections hopes to use teleconferencing to help teenagers in detention homes develop social networks in their communities that could keep them from foundering when they return home.

- The state's Department of Human Services sees a role for teleconferencing in helping children who are temporarily placed in foster homes maintain some relationship with their own parents.

- A private service organization plans to carry teleconferencing equipment on a boat it uses to bring services to the roughly 4,000 people who live on ten islands off the coast of northern Maine.

- Another private organization would like to provide translation services to help all Maine hospitals communicate with non-English speaking patients. Hospitals have legal responsibility to provide such services, but in a state like Maine, few hospitals, if any, can afford to hire translators by themselves.

The list goes on. "As you start collaborating, people start coming out with more and more ideas," says Dr. Patel. "Even we didn't envisage the level of applications that are coming out."



It takes more than a good idea to make telemedicine work, though. Before a new service can be added, staff from the regional center must work with specialists to develop protocols for electronic medical visits. They must learn what the specialists need. They must train people not only in the use of technology, but in the specific conditions that must be met for successful teleconferencing consultations—including such issues as how should a patient be presented, what should the lighting be, and what information should be collected in advance. "It's very laborious," says Schmidt. But, he predicts, the number of sites the regional center has helped connect to the network — about 100 in the spring of 2001 — will more than double by the end of 2002.

And like others who have experience with telemedicine, he expects to see entirely new services added to the mix.

What is the outer limit? Dr. Daniel Nadeau, an endocrinologist based at Eastern Maine Medical Center in Bangor, Maine, believes personalities may determine the answer to that question more than the actual medical requirements. “It takes synergy between the people involved to make it work well,” he explains. Still, Dr. Nadeau says some specialties may be more suited to telemedicine than others. He cites fields like endocrinology, dermatology and psychiatry, which require little hands-on examination or treatment of patients. “Most of the information you need you can get by talking with the patient and looking at lab results,” he notes. On the other hand, he laughs, surgery may not lend itself to telemedicine as readily.

He may be right. Then again, turn to the next chapter.

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