Bringing quality care, close to home

Advancing technology fosters growth of Avera Telehealth

BY DONNA FARRIS, AVERA MCKENNAN WRITER/EDITOR

With more and more applications to further the science of medicine at a distance, telehealth continues to evolve at Avera – especially as technology advances and as physicians, staff and patients alike adopt this growing aspect of technology.

"Telehealth is the umbrella term for whatever technology health care might use to provide services at a distance, whether those services are clinical, educational or administrative," said Mary DeVany, director of Avera Telehealth. Telehealth is an Avera-wide program that is also continually supported by Avera McKennan physicians and staff. "Interactive video conferencing, interactive physician consults, still images, teleradiology, Avera eICU® CARE, research-based activities…all of these use an application of telehealth."

Telemedicine is the term used to describe the actual practice of medicine through telehealth, for example, a consult between a patient in a rural setting, and a specialist in Sioux Falls.

In the early 1990s, telehealth evolved on two fronts – through a small pilot project between Avera McKennan and Avera Flandreau Medical Center, and on a state level.

Telemedicine opens the door to expert specialty care for more patients

Monitoring a tiny heartbeat and evaluating body structures, perinatologist Naomi Wahl searches the ultrasound screen in her Sioux Falls office at Avera Maternal-Fetal Medicine for anything that could endanger the health of a mother or her unborn baby. While the ultrasound technologist and the pregnant mother could be in the same room with the doctor, most likely, they are in a small town such as Pipestone, Minn.; Spencer, Iowa; or Milbank, S.D.

Such live, interactive consultations have been going on for 10 years now, through the technology of telemedicine.

"It's just as if I'm watching an ultrasound that's going on in the same room," Dr. Wahl said. Unlike seeing a prerecorded ultrasound tape, she can give directions to the ultrasound technologist, or ask the patient a question. Dr. Wahl is most likely to be asked to view ultrasound scans in the case of high-risk mothers, for example, those at risk for preterm labor.

"Via telemedicine, I can see patients who otherwise wouldn't be able to be here," Dr. Wahl said. Perhaps they shouldn't travel in their condition, or they can't afford to miss a day's work. She's able to interactively make care recommendations and decisions. If premature birth is imminent, she may recommend transport to Avera McKennan, where a Level III Neonatal Intensive Care Unit is ready for the care of the infant.

In the past, Dr. Wahl traveled more often to outreach clinics, but now telemedicine allows her to care for more patients, and spend less time in her car on the road.

Telemedicine is one of many ways that Avera provides patients with top-quality care close to home.

Avera – a telemedicine leader

Over the past decade, Avera has emerged as a national leader in telemedicine – the practice of medicine at a distance using various technologies, such as interactive video.

Dr. Wahl is just one of over 25 Avera clinicians who provide consults in 16 medical specialties, such as nephrology, pediatric pulmonology and cardiology, endocrinology and oncology. In 2007, Avera Telehealth facilitated 2,600 telemedicine consults, compared to 1,700 the year before. In 2008, the number of consults is expected to exceed 3,000.

Dr. Tad Jacobs, family practitioner in Flandreau, S.D., has been involved with telemedicine as a referring physician since the program was piloted in 1993.

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"I think our goal right from the start was that our rural hospital in Flandreau should really be treated no differently than any other wing at Avera McKennan. I think we've accomplished that," he said.

Technology has improved since the 1990s, when connections were slower, creating a lag time in conversation. "That has improved with advances in technology and equipment, and especially as we expand our broadband infrastructure," Dr. Jacobs said.

Dr. Jacobs said he routinely calls on specialists through telemedicine in areas such as infectious disease, psychiatry, wound management and dermatology.

"Patients obviously like that they don't have to travel. More than that, they like that direct interaction with a specialist in their hometown," he said.

Dr. Aristides Assimacopoulos of Infectious Disease Specialists said physicians prefer telemedicine to phone consults, in which they don't receive any reimbursement for their time, they may not receive all the information they need to make an informed recommendation, and patients do not get the full benefit of the specialist's expertise and attention.

"We do virtually everything by telemedicine that we can do in person," Dr. Assimacopoulos said. Telemedicine consults have gone far beyond the few per year he expected when he began in 2002, with all four physicians in his practice now routinely doing consults. "It's huge. We do over 1,000 in a year," he said. Telemedicine's popularity is growing with patients, physicians and specialists alike. "We can offer the same subspecialty attention that patients receive in Sioux Falls throughout our service area."

Benefiting Avera's tiniest patients

The latest development in tele-medicine is known as Avera CareView, in which neonatologists in the Avera Children's Hospital Neonatal Intensive Care Unit, consult with regional hospitals to help stabilize critical newborns.

The importance of this service became clear during a March 2005 blizzard, when weather prevented a premature infant born at Avera St. Benedict's Hospital in Parkston, S.D., from being transported either by ground ambulance or air. An interactive video connection allowed Avera St. Benedict's physicians to consult with Avera neonatologists. The baby was stabilized until the time he could be transported to the Level III NICU at Avera Children's Hospital, where he spent 137 days. Besides Parkston, Avera CareView connections have been established at rural hospitals in Estherville, Iowa, and Pipestone, Minn.

A collaborative effort began between Avera McKennan, Rapid City Regional Hospital and Sioux Valley Hospital in Sioux Falls. "The goal at that time – and the goal that remains – is to be able to cross-link through an interconnected open system. Technology has changed how we connect, but that principle remains in place," DeVany said.

Telehealth is catching on, thanks in part to better and less expensive technology. Another key is cultural acceptance. "Physicians, facilities and departments continue to discover applications that suit them," DeVany said.

In the future, DeVany believes there will be less and less distinction between telehealth and the everyday activities of health care. It will be irrelevant, for example, whether doctors are seeing patients in person, or through a telemedicine consult. Education will take place in the location of choice for the learner, rather than a classroom.

A mother might show a physician her child's skin rash from the comfort of his bed at home via a webcam rather than bundling him up for an office visit. Such electronic "house calls" may not happen in the next year or two, but they are a possibility in the next decade or two.

Without telehealth, there would be less access to care and education, and more travel. "We are focusing on quality health care, close to home. That is telehealth's prime purpose," DeVany said. "Telehealth helps keep health care available in a much more cost-effective manner."

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Equipment in the Avera McKennan NICU involves a monitor with an interactive video camera mounted on top. Rural sites are equipped with a portable video unit. Cameras can zoom in to give greater detail, to read a gauge, or see a specific site on the infant's body.

"Rural health providers are responsible for a wide range of health issues, and this is one of the ways we can support them as they handle these crises," said Marilyn Dahler, clinical telemedicine coordinator for Avera Telehealth.

A higher level of care

Benefits of telemedicine are many:

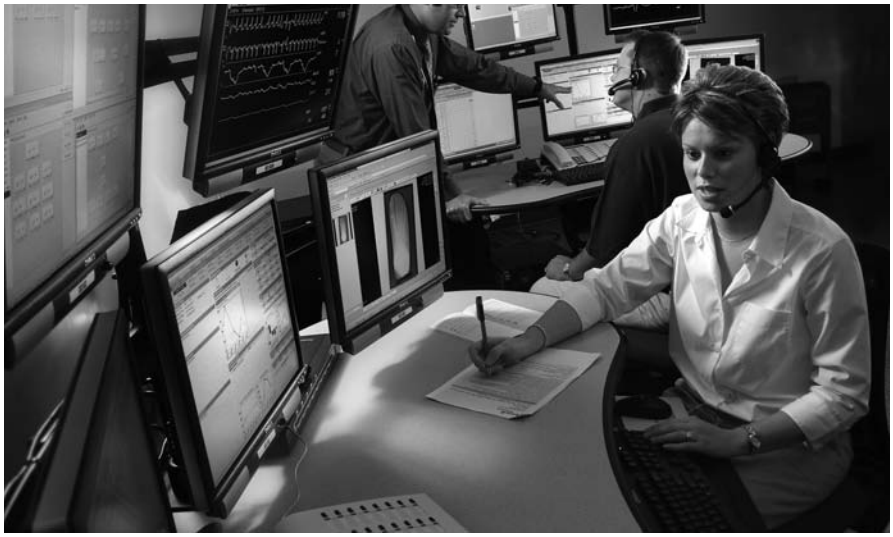
- Patients enjoy a higher quality of care through increased access to specialists, as well as added convenience. They do not have to leave their hometown or miss work. "People know their hometown. They're comfortable there. If we can allow that comfort to remain and not increase the level of stress by asking them to drive to Sioux Falls, I think that's a big service we can provide," said Mary DeVany, director of Avera Telehealth.
- Local hospitals and clinics enjoy benefits similar to having on-staff specialists. Testing can be performed at the local facility, as well as follow-up care, allowing for a seamless continuum of care.
- Communities benefit because patients stay in town, purchasing medications at the local pharmacy, eating at local restaurants, and buying groceries and gas locally.

"Overall, it's been a tremendous asset for us and patients, and I hope we continue to expand it," Dr. Jacobs said.

High-tech 'traffic control center' proven to save lives

Tucked away on an upper floor on the Avera McKennan campus is a high-tech information center wired to nearly 70 intensive care beds across a four-state region. More than technology for technology's sake, the work that quietly continues 24/7 is proven to save lives.

It's called Avera eICU® CARE, a service provided by Avera Health to 15 hospitals, one of which is Avera McKennan. Nine more hospitals wait to come on line.



"The analogy we always use is that of an air traffic control tower," said Pat Herr, Avera eICU® director. "Patients are the planes, and the pilots and co-pilots are the doctors and nurses at the different sites. Our job is to assist them as they make critical care decisions."

The eICU® concept, by VISICU Inc., is designed to make specialized care by intensivists – physicians specially trained in the care of critically ill patients – more widely accessible. Nationwide, almost 5 million patients are admitted to ICUs each year and more than 500,000 of these patients die. Studies show that at least one in 10 patients who die in ICUs every day would survive if dedicated intensivists were present in the ICU to manage their care.

Yet a shortage of intensivists makes such bedside care impossible in most locations. With only about 6,000 of these specialists in practice, less than 15 percent of ICUs have dedicated intensivist care.

The eICU® solution

After the need for a tele-intensivist program at Avera was recognized by Dr. David Erickson, Avera Health senior vice president and chief medical officer, and Dr. David Kapaska, Avera McKennan senior vice president of medical affairs, Dr. Edward Zawada took on the task of implementing a program along with the help of Francie Miller, Avera McKennan assistant vice president for emergency and adult specialty services.

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Distance education spans the miles

It's irrelevant whether students are sitting in a lecture hall in Sioux Falls, or a classroom in Milbank, S.D. They're part of an interactive learning environment, gaining insights on the latest medical topics from experts in the field.

It's happening almost daily through Avera Telehealth. Currently, most Avera partners as well as some independent sites are wired for interactive video conferencing, said Karissa Weber, distance learning coordinator for Avera Telehealth.

"Someone in Flandreau gets same benefit and interactions as someone in Sioux Falls. It's almost like being there," Weber said. Educational sessions not only originate from Sioux Falls, but from Avera facilities in Yankton, Aberdeen, Mitchell and elsewhere.

Continuing medical education, nurses training, parenting education and physician "Grand Rounds" from the University of South Dakota School of Medicine are just a few of the available opportunities. Administrative meetings and diabetic support groups also take place at a distance.

Interactive videoconferencing holds major advantages over listening to a videotape or sound recording of a lecture after the fact. For example, listeners can ask questions, or join in on the discussion. Plus, attending a live class is often a prerequisite for earning continuing education credit.

Considering the cost of gas, travel time, hotel rooms and meals, telehealth education provides significant savings to organizations which would otherwise have to send staff out for meetings, conferences or required continuing education. Also, sending key personnel out for days often leaves small facilities short-staffed.

The concept supports physicians at rural sites, who may not have as much opportunity to interact with colleagues. "Physicians tell me how valuable it is to see how another physician practices, or to gain more information on a given topic without having to drive or take time away from their practice," Weber said.

Avera eICU® CARE was opened in September 2004 at four sites: Avera McKennan in Sioux Falls, Avera Sacred Heart in Yankton, Avera Queen of Peace in Mitchell and Avera St. Luke's in Aberdeen. Since, Avera eICU® CARE has assisted in the care of more than 10,000 patients.

While eICU® was designed with big-city hospitals in mind, Avera's was the first eICU in a Midwestern rural setting providing this service to Critical Access Hospitals. "As far as rural United States is concerned, we're the leader," said Dr. Zawada, an Avera nephrologist who is also board-certified in critical care.

Once Avera eICU® was implemented, Avera physicians began working on critical-care protocols following evidence-based care, Dr. Zawada said.

"Very soon, our statistics starting looking very good compared to the national group, and placing us at the forefront," Dr. Zawada said.

For most quarters since September 2004, Avera eICU® has been number one among the 40 eICU centers in the nation in severity-adjusted ICU length of stay. That means that for the same magnitude of illness, Avera patients stay in the ICU the shortest amount of time. Also for many quarters, Avera has had the lowest severity-adjusted ICU mortality, the shortest overall hospital stay and lowest hospital mortality. Because the intensive care unit in a hospital is often the most expensive type of care, a shorter ICU stay saves health care dollars.

"Our short length of stay in the ICU has made us number one in high-quality, cost-effective care. Others are calling on our expertise to advise in the operation of their centers," said Dr. Zawada, who has presented at national conferences, as has Dr. Erickson.

A day in the Avera eICU®

Technology in the Avera eICU® center provides a computer interface to "wired" beds at all 15 sites. An intensivist is on duty 20 hours day, from noon until 8 a.m. "They're here during the hours when the attending physicians aren't usually at the bedside doing their rounding," Herr said. Nurses and support staff man the center 24 hours a day.

Rather than making rounds to hospital bedsides, Avera eICU® physicians work at computer screens, constantly monitoring patients. Patients are stratified by risk, with the most critical patients being surveyed every hour, and less critical patients evaluated every two to four hours. Lab data, X-rays and medication lists are also at hand for the physician to review. At Avera McKennan, beds in the ICU as well as the pulmonary acute unit are wired to Avera eICU®.

The system automatically alerts Avera eICU® doctors and nurses of any negative trend, such as a decrease in oxygen percentage, a drop in blood pressure, or an increase in heart rate. Equipment allows Avera eICU® staff to virtually "go" to the patient's room in the case of any concerns. Monitor readings can be displayed on computer screens in the center, and via cameras, doctors can zoom in on patients themselves, or equipment such as an IV pump or ventilator.

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Speakers allow staff between the ICU and Avera eICU® to communicate without having to leave the bedside to pick up a phone.

"For eICU doctors, the key is multitasking," Dr. Zawada said. The physician might be watching one patient who just had a breathing tube inserted, while keeping an eye on an another patient with an irregular heartbeat, initiating orders for a new patient, analyzing trends, and taking phone calls.

"It's rewarding in that we're helping people get the best care they can, as close to home as possible," Dr. Zawada said. "On any given day, we're working with 30, 35 or 40 patients – many more than a physician rounding on the floor can handle. All the minute-to-minute decisions add up to a tremendous experience."

Having the Avera eICU® located on the campus of Avera McKennan, a tertiary care center, is advantageous. Most staff working in the Avera eICU® also work in the Avera McKennan ICU, and Avera McKennan specialists are regularly called to consult on cases, Herr said.

"That peer-to-peer communication takes care to a totally different level," Herr said.

A vital connection to rural sites

Among Critical Access Hospitals wired to Avera eICU® is Avera Holy Family Health in Estherville, Iowa. The hospital has six family practice doctors on staff, who provide clinic services as well as emergency room coverage. Half of the doctors also have active obstetrical practices.

Avera Holy Family has one wired bed in its special care unit. While one bed is enough for the relatively small number of critical care patients seen in Estherville, the connection also provides back-up for family physicians taking emergency call or delivering babies, said president Bill Bumgarner.

"Avera eICU® offers the opportunity to keep some care locally that would have been transferred in the past," said Bumgarner. "This can serve to reduce the anxiety associated with a challenging health care situation for patients and their families." Another benefit for patients is saving the cost of air or ground transport.

The concept creates a better quality of life for physicians. Because an intensivist is in the Avera eICU® through the overnight hours, that physician can be called upon at 2 a.m., rather than the physician at home. Avera eICU® physicians and nurses are credentialed in all states where the service is provided, so they can write orders and prescribe medications.

Saving lives, case by case

"For the patient, it's real-time intervention," Herr said. "We can spot a negative trend and intervene before the problem becomes full-blown."

Avera eICU® staff monitor details such as potassium, electrolyte or glucose levels. "Research shows that if we manage those in a normal range, patients will have better outcomes," Herr said.

A major area of impact has been in the case of sepsis, a cause of shock due to bacterial infection, Dr. Zawada said. Sepsis is the second leading cause of death in the ICU, outside of cardiac issues. "Data shows that the sooner we begin working in an organized, step-by-step early intervention program, the better. Timing is critical. This has been one of the main areas where eICU has pushed the agenda, and has helped save lives."

Other areas of impact include fewer cases of ventilator-acquired pneumonia, thanks to measures to get patients off breathing machines sooner, and fewer complications due to getting blood sugars down as soon as possible. This measure is probably more important for non-diabetics than diabetics, as adrenaline and stress hormones can cause their blood sugars to spike.

Only 7 percent of beds nationwide are monitored by an eICU®. There are nearly 40 eICU centers in the nation. Avera's was the 11th and is the only one in the region. The closest is now in a newly-opened eICU in Omaha, Neb.

Hospitals contract with Avera eICU® for a per-month fee. There is no patient billing. Hospitals offset the costs through benefits such as shorter lengths of stay, fewer complications and keeping patients close to home rather than transferring them to another hospital, Herr said.

"Next to a bedside intensivist on-duty 24/7, the highest standard of care we can offer our patients throughout the Avera region is the tele-intensivist, through Avera eICU®," Dr. Zawada said.

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