

Telemedicine and AV in the U.S.

Despite a wobbly economy, the U.S. health care sector has seen increasing demand, complete with doctor shortages and longer wait times at offices, hospitals and emergency rooms. According to the Bureau of Labor Statistics at the U.S. Department of Labor, health care will continue to grow. The Bureau expects that "the proportion of the population in older age groups will grow faster than the total population between 2008 and 2018. In addition, older persons have a higher incidence of injury and illness and often take longer to heal from maladies."

This population swell means a greater demand on a healthcare system that is already straining. As a result, telemedicine has emerged as a means to improve access to medical specialists and facilitate more efficient communication between doctors and patients. At the heart of telemedicine lies AV and IT technology working in tandem for the benefit of all parties.

What is Telemedicine?

According to the American Telemedicine Association, "telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve patients' health status. Closely associated with telemedicine is the term 'telehealth,' which is often used to encompass a broader definition of remote healthcare that does not always involve clinical services. Videoconferencing, transmission of still images, e-health including patient portals, remote monitoring of vital signs, continuing medical education and nursing call centers are all considered part of telemedicine and telehealth."

"There are a variety of telemedicine applications, from the mundane to the complex," explains Andrew W. Davis, senior analyst and co-founder of Wainhouse Research, an analyst firm that concentrates on collaboration products and services. "On the mundane end of spectrum is videoconferencing systems used for business meetings in a hospital setting, or more complex situations where a doctor is conferencing with the patient and a remote expert or a hospital."

Certain segments within the healthcare industry, such as those with bilateral interaction or that rely on visual cues, have quickly adopted videoconferencing as their telemedicine medium. Those include psychiatry, dermatology, radiology, neurology, dentistry, pathology, and cardiology. Davis notes that military psychiatrists have adopted videoconferencing as a way for post traumatic stress disorder (PTSD).

Telemedicine and AV

According to Davis, telemedicine might be based on three kinds of videoconferencing systems: standard videoconferencing systems for use in doctor's office or for medical education, purpose-built telemedicine carts equipped with videoconferencing capabilities, and unmanned robotic systems that are steered by medical practitioners from remote offices. "It is estimated that less than 10% of the total videoconferencing user base is telemedicine and telehealth, but that figure is growing," adds Davis.

"The physician consult has morphed from a phone call to a video chat," says Dr. Jay H. Sanders, president and CEO of The Global Telemedicine Group and a physician who is known as the "Father of Telemedicine" for his accomplishments, such as establishing the first statewide telemedicine system in 1991. "The technology has changed radically, from having to build a system ourselves to now being able to buy a robust conferencing system off the shelf."

Sanders' first telemedicine foray began in the 1960's at the behest of his mentor, Dr. Kenneth Bird, a pulmonologist at Massachusetts General Hospital (MGH). Sanders credits Bird as the man who came up with the idea of a telemedicine system. Bird would often get stuck in traffic on the way to Boston's Logan Airport to fulfill his other role as the medical director for Logan Medical Station. Bird drove there every day and the trip was three miles, and one hour, each way. Bird's idea was to establish a microwave link between MGH and Logan for remote communication.

Sanders continues, "The first step in telemedicine technology is using videoconferencing, and it is still a very effective component of multi-modality capability. Face-to-face interaction benefits the relationship-building and the transfer of expertise from the specialist to the regional hospital, for example. It's also important for continuing education for the physician. With more access to a specialist, a doctor's need for a consult goes down because they've gained the knowledge in how to treat the problem."

For Dr. Keith Vrbicky, a practicing OB/GYN and founder of telemedicine services provider American Educational Telecommunications (AET), the technology challenges certainly have changed since he started his company in 1984. "We used ISDN lines at that time, which were expensive. There's been a sea change in AV technology that enables affordable delivery of telemedicine applications to both urban and rural locations," he says. "Hurdles to telemedicine adoption include non-reimbursement by insurance companies for the consult time and physicians who are hesitant to use the technology."

AET evaluates their technology based on the environment, the expense, and the country of use. "Some manufacturers have better support than others in different parts of the world," explains Vrbicky. "The goal is to make networking easier and less expensive at the point of use."

AET uses Polycom, Tandberg and Lifesize systems depending on the application. They are also the only company licensed to use the On Sight HD camera with Librestream mobile collaboration software for mobile telemedicine applications in North America. This mobile telemedicine package would allow a trauma team to stream audio and video of a serious accident to an emergency room team nearby, for example. By interacting with the onsite accident team, the physicians would be ready to take the accident victims as soon as they arrive.

AET tested the On Sight camera and Librestream software in Haiti to provide telemedicine services after the recent devastating earthquake. "We could use it to connect to the U.S. for dentistry consults via satellite," says Vrbicky. "If it could work in such harsh conditions, it can work anywhere."

Dr. Joe Peterson, CEO of Specialists on Call, a firm that provides emergency telemedicine consultations, 24/7 to hospitals using videoconferencing technology, says "Videoconferencing enables a single doctor to extend his reach to cover multiple hospitals at once. The traditional model of having a local medical specialist onsite is inefficient. A doctor using videoconferencing can achieve twice the number of consults in a 12-hour period than a specialist onsite. Videoconferencing is the key component."

Specialists on Call is one of the largest firms of its kind and expects that by year end 2010, they will have provided 23,000 consults via videoconferencing technology. Peterson says his company is very happy with Tandberg - their systems are solid, reliable, and provide advanced network security protocols - but that they are technology-agnostic and not married to any one brand. "We keep up with the latest in videoconferencing technology since we are responsible for the hardware displayed at the hospital. Our 24/7 instant response IT group takes care of the systems because videoconferencing is still unknown by hospital IT staff. I don't want them tinkering with it," he says.

Physicians who work with Specialists on Call must use the company's sanctioned videoconferencing systems in the appropriate environment. "Our doctors are not allowed to use Skype on their laptop for a consult. Patients often divulge sensitive medical information so you can't have the doctor sitting at a coffee shop or at the country club," says Peterson.

Sanders says that telemedicine and videoconferencing are making a big difference to rural communities where the hospital acts to stabilize the socio-economic fabric of the area. "The hospital is usually the top employer so when they close, the area suffers. There is a decreasing bed census due to the lack of specialists so they have to discharge you and the problem worsens," he notes. "Telemedicine is also reaching into the workplace. Employers forget that they have telemedicine systems in their office already. They just need an open RS232 port on their videoconferencing system to plug in any number of medical devices like a stethoscope or blood pressure monitor. Workers can save on productivity by doing routine checks without leaving work."

According to Sanders, the benefits of telemedicine are clear. He adds, "Studies have shown that patients are more compliant when they see the doctor face-to-face; their attention span goes up. Doctor and patient are able to communicate in an intuitive way using videoconferencing, and there's no wait at the doctor's office. Telemedicine increases convenience and reduces travel cost for the patient."

The Future of Telemedicine Technology

Vrbicky thinks that the next evolution in telemedicine is mobile solutions, like rolling carts, that bring telemedicine to rural communities that otherwise have no access. "Mobile solutions will have a big impact in nursing homes and in-home health services as well," he says. "It's dangerous and costly to transport nursing home patients to the hospital, so instead the physician can remotely come to them. Mobility also helps doctors adopt telemedicine applications since they don't sit still and wouldn't use a desktop or fixed system."

Vrbicky added that other telemedicine applications will include the use of wireless biosensors and their use in patients with chronic illnesses and home care.

Meanwhile, Peterson says that refinement of current offerings is the next evolution to telemedicine. He recently evaluated a rolling cart with a keyboard 36-inches from the ground. "A nurse would have to sit or bend over to use it, which is inconvenient since chairs are scarce in a hospital," he explains.

"The next revolution in telemedicine is cheaper and more reliable technology, like Apple's FaceTime chat over the iPhone. Everything is in the smartphone," says Sanders. "Phones will have computing power so people can wear health sensors and have the results analyzed by their phones. The phone can send an alert to the physician if the data is outside the normal values."

The prominence of telemedicine and videoconferencing will grow as bandwidth improves across the U.S. The Federal Communications Commission's National Broadband Plan specifically addresses health care as a prime topic. The FCC's plan recommends substantial changes to its Rural Health Care Program to assist rural clinics and medical offices to purchase affordable broadband services.