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Telehealth: Just a Call Away

EXECUTIVE SUMMARY

Telemedicine—or telehealth as the broader concept—is on the phone and mainstream healthcare is about to take the call. Characterized by decades-long development marked by intermittent growth spurts, especially in the mid-to-late 1990s, telehealth is poised for another, more dramatic leap that could help create a new and more efficient model for healthcare.



Jonathan Linkous,
executive director,
American Telemedicine
Association,
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Telemedicine—or telehealth as the broader concept—is on the phone and mainstream healthcare is about to take the call. Characterized by decades-long development marked by intermittent growth spurts, especially in the mid-to-late 1990s, telehealth is poised for another, more dramatic leap that could help create a new and more efficient model for healthcare.



“Telemedicine has grown two ways,” says Jonathan Linkous, executive director of the Washington, DC-based American Telemedicine Association. “It’s grown deeper,

with more traditional services and applications like teleradiology being used more widely; and, it’s grown wider, by developing newer types of services and applications such as patient-doctor communications via email, remote telepharmacy services for rural clinics, robotic surgery and even more consumer-based wellness applications like tracking one’s personal health and even attending weight-reducing classes over the Internet. It’s a whole different world,” he says, from its initial use in NASA and Arctic outposts,

Indian reservations and correctional facilities.

While it remains a tried and true strategy for those areas, telehealth’s scope has exploded. Nearly every state has a telehealth network and most IDNs have at least some telehealth initiative underway. Radiology accounts for its largest use, but much of telehealth’s growth is in areas not immediately recognizable, says Linkous. “There’s a lot of telemedicine going on that isn’t called telemedicine, including pacemakers, heart and fetal monitors whose data can be downloaded over the telephone.”

In this Information Edge snapshot we interviewed experts at Partners Healthcare in Boston, Henry Ford Health System in Detroit, INTEGRIS Health in Oklahoma City, University of California Davis, the University of Arizona in Tucson and the Marshfield Clinic in Wisconsin. Each has a different perspective on telehealth applications, but everyone agrees that it can increase efficiency, quality and especially access to care—and that telehealth is ready for primetime.

Today Massachusetts, tomorrow the globe

Joe Kvedar, MD, director, Partners Telemedicine at Partners HealthCare System in Boston, says it’s important to distinguish telemedicine/telehealth from informatics. “Informatics is a robust set of tools for physicians to care for patients at the bedside or in their offices. Telehealth

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NEWS

Kudos to Brent James, MD, executive director, Institute for Health Care Delivery Research at Intermountain Health Care, Salt Lake City, for winning the NCQA 2005 Health Quality Award. The awards are presented every two years to honor individuals and organizations for their work in improving the quality of healthcare in the U.S.

offers tools to provide care when patient and provider are in different locations, especially using telecommunications,” he says. “Telehealth is basically about access to care,” says Kvedar. It also ensures that patients have the same or greater quality of care even when they’re in remote locations. A third—and the newest value proposition—is efficiency, he says.



Joe Kvedar, MD,
director, Partners
Telemedicine, Partners
HealthCare, Boston



“In the 1990s, we started out heavily in videoconferencing between one center and another. A patient would go to a dedicated room in a community hospital to connect with a physician far away. That’s what’s old,” says Kvedar.

What’s new is the rapidly increasing interest in telecom to provide more efficient care; it’s the economic driver. The telehealth marketplace is saturated in the areas of prisons and rural health. “Those are largely access plays on which a lot of telehealth people cut their teeth,” he says, adding that Medicare has traditionally supported telehealth for patients in non-metropolitan areas.

The growing marketplace is in home telehealth, eICU, and doctor/patient online communication. Not surprisingly, there’s a huge increasing demand for using telehealth to manage chronic disease like CHF and diabetes, which are rising in incidence, high cost and impacted by shortages of nurses, physicians and other healthcare workers.

Emergency call

“The system is crying for efficiency,” says Kvedar, and telehealth has begun to catch

the attention of healthcare CEOs in just the past six months as a possible solution. “Telehealth is especially applicable for conditions that do not require patients to come into the office or hospital. In fact, they might do better. Not only might they do better but it will help us do better in terms of workflow efficiency.”

A key driving force will be the federal government, which is especially concerned about high-cost care for beneficiaries and is becoming more involved in disease management. For example, the Care Management for High Cost Beneficiaries (CMHCB), a risk-sharing program being piloted by CMS to see if such strategies can lead to higher quality at lower cost, has put out an RFP to target 40,000 to 50,000 chronic-care patients and has allowed telehealth solutions, especially for monitoring patients in their own homes. The goal: to reduce doctor-office visits and hospital admissions and to provide those patients better care.

Whether it’s government incentives, pay for performance programs or the need for chronic disease management, a confluence of factors is driving telehealth into the discussion of reengineering mainstream healthcare, says Kvedar, adding that technology maturation has also played a role. “Ten years ago, we didn’t have Netscape Navigator. Now, the tool of choice is the cell phone to send personal medication reminders, rich educational content and transmissions to the medical record. I’m interested in how consumer technology can be used. What we’re doing, in effect, is putting the doctor’s office in the home, using blood pressure cuffs and other basic monitoring devices. The more unobtrusive the sensors are the better.”

The designers of such equipment must avoid two pitfalls, he cautions: 1) if the devices are too clumsy, the user interface is too difficult or there’s too much heavy lifting, sick patients won’t be able to use them;

2) if the devices look too much like clinical equipment patients will want to get rid of them because they will be reminders that they are sick. “The user interface must be very compelling,” says Kvedar.

Partners has undertaken a breadth of activities in telehealth over the past 10 years. Its original focus was two-fold:

- Extend the reach of medical specialists and therefore the Partners brand name by offering second opinions to any patient in the world;
- Provide distance education for clinicians and staff.

Futurescape

But Partners Telehealth is nothing if not forward looking. A big part of its mission is to determine how those technologies will be integrated into care in coming years and position the organization for that transition. Specific initiatives that will gather cost and quality outcomes data over the next year include a CHF-monitoring program that has patients checking their weight, blood pressure, glucose levels and other vitals twice daily on sensors that will automatically transmit data to nurse case managers.

Another initiative involves visiting nurses who use digital imaging to help patients manage their own wounds. “We’re moving from off-the-shelf digital still cameras to camera phones,” says Kvedar.

A third initiative involves online follow-up visits for dermatology patients, who will be able to take their own digital photos and attach them to emails discussing their condition with their physicians. Blue Cross Blue Shield of Massachusetts has committed to funding the e-visits.

“Telehealth is really evolving,” says Lorraine Pellegrino, RN, MHA, clinical nurse liaison and manager for the Center for Health and Technology at the University of California Davis. Eight to 10 years ago,

she says, “traditional teled” typically meant a specialty consult at a remote site using a high-bandwidth telephone line. Today various applications are available that do not require high bandwidth, especially in homes. “There’s a huge explosion in telemedicine using analog phone lines for managing chronic disease,” she says.



Lorraine Pellegrino, RN, MHA, clinical nurse liaison & manager, Center for Health and Technology, UC Davis

Pellegrino says the technology has made clear advances in just the past seven years to be more user friendly, dependable and reliable. Prices have dropped and the connections are more consistently stable, she says, still acknowledging that “you’ll always have a certain percent of time that lines can drop.”

Organizations like the VA have seen the cost savings and the improved outcomes and have modified their missions to accommodate telehealth. “I expect the same thing to occur in the private sector,” says Pellegrino, as telehealth begins to become part of business strategies and then helps foster a new model of care.

OK for telehealth

One organization bridging the gap between traditional telemedicine and the new telehealth is Oklahoma City-based INTEGRIS Health, which in 1993 became the first healthcare organization in the state of Oklahoma to build its own telehealth network, notes Pamela Forducey, PhD, ABPP, director of INTEGRIS Telehealth. It started with six facilities: five rural sites and its flagship hospital Baptist Medical Center.

In 1997, INTEGRIS was awarded a six-year, \$1.4-million grant from the Health

Upcoming Events

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April 27

(co-hosted with HIMSS)
Transforming Nursing Practice—Clinical Systems and the Nursing Unit of the Future

- Jon Burns, senior executive, information technology, Cleveland Clinic Foundation, Cleveland

April 28

(co-hosted with AMDIS)
Information Technology Supporting Infectious Disease

- Tim Zoph, VP & CIO, Northwestern Memorial Healthcare, Chicago
- Gary Noskin, MD, infectious disease, Northwestern Memorial Healthcare, Chicago

May 10

- Mike Brown, director of purchasing, University Health Care System, Augusta, Ga.

May 18

Scottsdale Healthcare New Facility Planning: Technology and IT Implications

- Jim Cramer, CIO, Scottsdale Healthcare, Scottsdale, Ariz.

May 19

Software Contracting and Negotiating: Successful Strategies

- Diana McKensie, chair, Information Technology Group, Neal, Gerber, Eisenberg, LLP, Chicago

more events on next page

*Upcoming Events continued***May, 24**

*(co-hosted with AMDIS)
Differentiation based on
Quality: The DeKalb
Institute Model*

- Steve Meurer, MBA/MHS, PhD, executive director, DeKalb Quality Institute, Decatur, Ga.
- Cynthia Adgate Davis, CIO, DeKalb Regional Healthcare System, Decatur, Ga.

June 1

*Trends & Glimmers: The
State of Healthcare IT*

- Dave Garets, CEO, HIMSS Analytics, Chicago
- Mike Davis, EVP, HIMSS Analytics, Chicago

June 9

*Northwestern Memorial:
The NCQHC Award Journey
and Results*

- Julie Creamer, VP, operations and quality, Northwestern Memorial Hospital, Chicago
- Sally Szumlas, RN, MS, quality program director, Northwestern Memorial Hospital, Chicago

June 15

*Integrating Genomics and
Pathology: Blood Center of
Southeastern Wisconsin*

- Dr. Bellisimo, director of Molecular Pathology, Blood Center of SE Wisconsin, Madison, Wis.
- Mark Hoffman, PhD, Cerner Corporation, Kansas City

more events on next page

INTEGRIS *Health*



Pamela Forducey, director, Andrew Heuser, physical therapist, INTEGRIS Telehealth, Oklahoma City, OK

Resources and Services Administration (HRSA) Office for the Advancement of Telehealth (OAT) to expand its telehealth program. It's a good place to do it. Of Oklahoma's 77 counties, 65 are considered medically underserved areas (MUAs) or health care provider shortage areas (HPSA). "Oklahoma is extremely rural," says Forducey.

Many of INTEGRIS Telehealth's applications support telerehabilitation at the Jim Thorpe Rehabilitation Hospital in Oklahoma City. These include physical and occupational therapy, rehabilitation psychology, speech-language pathology and psychiatry (physical medicine). The center deals mostly with patients who have suffered strokes, brain and spinal-cord injuries. It has also developed contracts with seven rural public schools to provide speech therapy for their students with development disabilities and articulation deficits over T1 lines.

Andrew Heuser, a physical therapist at INTEGRIS, says treating young students provides a new and different aspect to telehealth. Since the inception of the speech teletherapy program, the center has conducted 6,364 speech teletherapy sessions with remote schools, successfully shepherding hundreds of kids through the

program. Telehealth helps schools comply with the 1990 Individuals with Disability Education Act (IDEA) in places like Stringtown, an impoverished rural town in southeast Oklahoma whose claim to fame is as the birthplace of country singer Reba McEntire. Forducey notes that the IDEA mandates that schools supply specialty-rehabilitation services such as speech-language pathology, physical therapy and/or occupational therapy to students with disability. Because of the geographic locations and sparse populations, many rural communities do not have these specialties. Telehealth is a natural and logical alternative to traveling to metropolitan areas and allows schools to comply with federal mandates.

INTEGRIS distributes videophones to patients and nurses for telemonitoring of CHF, COPD (chronic obstructive pulmonary disease), diabetes and wound care. Videophones are considered "low-tech" among a slew of peripheral devices for monitoring heart rate, blood pressure, glucose, oxygen saturation and weight gain. "Whatever the disease process is, we'll provide the peripherals," says Heuser.

Once a patient with a chronic disease or wound has had an initial face-to-face visit with a physician and has received training in self care—managing a wound dressing, for example—they use the telemedicine devices for remote monitoring as frequently as their condition requires. An extreme diabetic may be monitored several times a day. "It allows medical care in the home without a nurse having to do it and it reduces the number of ER visits," Heuser says.

Forducey sees an evolution of healthcare in America from an initial provider-driven model in the 1970's to one payer-driven under managed care in the 1980's and 1990's to consumer-driven today in 2005. Consumers of today are becoming more educated and proactive in the management

of their medical condition, partly due to the sophistication and availability of technology. “We believe telehealth incorporates the consumer as the core of care,” she says.

Despite what seem like obvious advantages of telehealth to organizations like INTEGRIS, it’s still a struggle to convince payers like CMS of telehealth’s particular value compared to, say, home health in stroke-rehab therapy. That’s why INTEGRIS has launched a study funded by Blue Cross Blue Shield of Oklahoma to determine if telerehabilitation is comparable to home health in cost and quality. If the results are positive, which therapists like Heuser expect, then it should be easier to convince the government and insurers to pay for these applications for people who cannot access such services due to location or lack of funds.

Scoping telepathology at Ford

If Oklahoma’s INTEGRIS demonstrates the power of telehealth in underserved rural areas, Henry Ford Health System in Detroit shows how an urban/suburban integrated health system can take telehealth to new levels in pathology. By combining the latest digital-imaging microscopes and a telecom network, Henry Ford is creating “a completely new paradigm” for telepathology, says Mark Tuthill, MD, clinical head of pathology informatics at Henry Ford.

Although telepathology has existed for 30 years, it’s just now coming into its own. “Pathology has had a long play in this space, but technical hurdles have obstructed its widespread use,” he says. Pathologists have wanted to transmit digital images of tissue slides for primary and secondary diagnoses for years, especially for difficult cases and those occurring in the off-hours like 2:00am. However, to deliver image quality necessary for diagnoses

required bandwidth not available until recently.



Mark Tuthill, MD, clinical head, pathology informatics, Henry Ford Health System, Detroit

But that hasn’t been the only impediment. Perfect images aren’t enough for pathologists, who must be able to move around the image—called field selection—and select detail to make diagnoses. Fortunately, all that is possible today. “Now, we’re readily able to remotely ‘drive’ the microscope and camera, change lenses, move around the field of vision and actually drive the slide,” says Tuthill. Also, where traditional methods required manual loading of a slide at a time, new systems allow electronic loading of slides, allowing the pathologist to remotely interact with multiple-slide stacks.

Systems like these allow pathology assistants, technicians or residents to quickly freeze tissue sections during an operation to evaluate lesions and the pathologist to study tissue sections from home without having to drive icy roads to the hospital in the middle of winter. “A technician can do the technical procedure and I can remotely drive the slide,” says Tuthill.

In another scenario, a pathologist at a sister hospital who wants help with a difficult case can simply put a slide on the telepathology system and can have a three

Upcoming Events continued

June 21

Incorporating Genomics into Clinical Decision Support: Personalized Medicine at Marshfield Clinic

- Carl Christensen, chief information officer, The Marshfield Clinic, Marshfield, Wis.
- Catherine McCarty, PhD, senior research scientist and director, The Marshfield Clinic, Marshfield, Wis.

June 22

Managing Standardization vs. Variation Balancing in Enterprise System Implementation

- Skip Lemon, VP, FCG, Long Beach, Calif.

June 28 or 29

The Continuity of Care Record (CCR) as a platform for Interoperability

- David Kibbe, MD, director, Center for Health Information Technology, American Academy of Family Physicians, Shawnee Mission, Kan., and co-chair, Physicians’ EHR Coalition

July 11

New York Presbyterian case study in Quality Improvement using Six Sigma

- Mary Cooper, MD, chief quality officer, New York Presbyterian Health System, New York

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Once digital devices are in place, maturation of a digital modality occurs quickly because people begin to ask what more they can do with the digital files they start collecting.

pathologists looking at it in real time. “That’s especially valuable in rural areas where there isn’t a lot of consultative expertise,” says Tuthill. “For just-in-time consultations and education this will be very valuable.”

Maurizio Vecchione, CEO of Irvine, Calif.-based Trestle Corp., which makes the telepathology system used at Henry Ford, says that such digital imaging has the potential to change the way care is delivered the same way other digital modalities have changed radiology and cardiology.

Historically, he says, once digital devices are in place, maturation of a digital modality occurs quickly because people begin to ask what more they can do with the digital files they start collecting. That leads to development of data-mining techniques that enhance not only clinical applications like those at Henry Ford but also the biopharmaceutical R&D process. Vecchione estimates that in North America about \$30 billion is spent a year on drug safety R&D, 5% of which goes to the area of toxicology testing of compounds on tissue slides. It’s ripe for telepathology data mining given that as many as 50,000 slides can be reviewed for a single drug-discovery process.

Trestle wants to be at the forefront, not only to provide the systems for clinical and research applications but also as a provider of outsourced services to ensure quality and throughput.

Telehealth blooms in the Arizona desert
Telepathology’s “father” moved to Arizona in 1990. Ron Weinstein, MD, who pioneered telepathology in the 1980s, now runs the Arizona Telemedicine network, part of the Tucson-based Arizona Health Sciences Center, which includes University Medical Center and the College of Medicine, where Weinstein also heads the department of pathology.

Created by the state legislature, the network runs over a private broadband network owned by the Board of Regents, links 150 sites and involves the participation of 41 healthcare organizations. Professional education has become a mainstay of the network with more than 9,000 hours of continuing medical education credit going to physicians over the years. A recent statewide video conference on bioterrorism brought heavy participation. The program also provides bi-directional, Web-streamed educational programs to support nursing, masters and PhD degrees.



Ron Weinstein, MD,
director, Arizona
Telemedicine Program,
Arizona Health Sciences
Center, Tucson



The telehealth center also runs a large telehealth research program that evaluates everything from devices to new healthcare delivery systems.

Users of telemedicine services include Indian reservations. Ten of 11 state prisons participate in the network, which provides 80% of all their specialty consultations. And rural hospitals also participate in what Weinstein calls the “Big Four” of clinical services over the network: radiology, psychiatry, dermatology, and pathology.

“Governance has been very important,” he says, citing a positive relationship between the university and the legislature as key ingredients in the network’s success. The Arizona Telemedicine Council, which oversees the network, meets quarterly at the state capitol and is chaired by State Senator Robert Burns. Another key factor for the success of the program is its business model, according to Weinstein. Created

on the ASP model, all 41 participating organizations pay a membership fee that gives them access to the network. The Arizona Telemedicine Program makes it easy for organizations to get involved in telehealth by centralizing and standardizing the reimbursement process, as in a single office under a business manager, eliminating some of the bureaucratic obstacles.

“We figured out how to finance telehealth,” says Weinstein.

That infrastructure has allowed the state to incorporate telehealth as an important element in its brand-new Institute for Advanced Telemedicine and Telehealth, which will include a new facility in downtown Phoenix featuring medical robotics and simulation.

Weinstein, who is a past president of the American Telemedicine Association, sees the desert blooming for telehealth. “We think Arizona could be a good test bed for next-generation healthcare systems. Telehealth in this state could be the common denominator.”

Digital stethoscopes in dairy land

In keeping with the agricultural region it serves, the Marshfield Clinic in Marshfield, Wis., uses telehealth for both people and animals. “We’re the only healthcare facility that combines food safety, veterinary and human health,” says Nina Antoniotti, program director of the Marshfield Clinic Telehealth Network, which includes 49 regional centers.

She says telehealth has evolved to cover three areas:

- Telemedicine—consultation with physicians;
- eHealth—asynchronous storing and forwarding of messages like email;
- Education—includes patient- and physician-driven web portals.

Marshfield Clinic TeleHealth Network (MCTN)



Nina Antoniotti,
program director,
Marshfield Clinic
Telehealth Network,
Marshfield, Wis.

The consultation piece includes live consultations, store-and-forward between patients and providers and a remote monitoring piece including collection of physiological data. “In terms of interactive care, there isn’t much you can’t do with telehealth. It’s

all feasible,” says Antoniotti. At Marshfield, telehealth offers a whopping 37 services, including cardiology, pulmonary, neurology—including Parkinson’s disease—adult telepsychiatry, dermatology and oncology.

“The only real limiting factor is the ability to touch, if that is a critical factor,” she says, which includes situations in which a physician or allied health professional needs to “palpate” the thyroid gland of diabetes patients, for example. “Otherwise, we can provide any picture or image as good-or-better-than can be obtained in person,” adds Antoniotti. There are all kinds of specialty cameras, digital stethoscopes, otoscopes and retinal cameras that can be directed remotely by providers in an interactive way. “Many times the technician can give them a better picture than the human eye or a \$300 stethoscope used in person.”

Marshfield’s telehealth program uses a \$3,000 stethoscope, for example, and a fiber-optic otoscope that can magnify images to the size of a PC screen, many times that of a physician’s eye.

“We’re really easing the burden, eliminating the barriers of distance and time to access healthcare. Providers can follow up in a much more timely fashion as well. Providers say they have better and more frequent access to the patient, more often

“In terms of interactive care, there isn’t much you can’t do with telehealth. It’s all feasible.”

**Scottsdale Institute
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Fall Conference 2005
Sept. 15-16, 2005
Spectrum Health
and Trinity Health
Grand Rapids, Mich.

**Spring Conference
2006**
April 6-8, 2006
Camelback Inn
Scottsdale, Ariz

they would normally. It eliminates the need for the patient traveling two hours to see me, they say, and it eliminates the provider having to juggle their schedule to accommodate the patient's trip. We have a spine surgeon who does his surgical follow-ups using the telemedicine network. For some patients it reduces the trip to only two hours from six," says Antoniotti.

The store-and-forward system can handle all digital images, including audio WAV files and ultrasound images, capture them in a mini-EMR and send them to a specialist for review and then back to the local primary care physician. Using the digital otoscopes, ENT physicians have been able to significantly reduce visits from kids who experience hearing loss. Remote monitoring of CHF patients supports early detection and symptom management, which reduces hospitalization.

Conclusion

Despite all the evidence that telehealth is entering mainstream healthcare, obstacles remain. Reimbursement is not the least of them. That's why most telehealth professionals are involved in lobbying CMS, local government or private payers in one way or another on the merits of the care model. "We have to catch up on reimbursement, regulatory language and interstate issues," says Antoniotti. While some many telehealth practices are covered under Medicare, for example, certified diabetes

education is not, she notes. Some states, like California, are quite progressive and prohibit insurers from refusing to pay for services delivered by telehealth. Other states are more conservative.

But Antoniotti is confident the message is compelling enough that it's just a matter of time. "My medical director says that whatever is good for patients is usually bad for healthcare [as a payment system]. Telehealth is a win for both sides."

In the future, says the ATA's Linkous, telehealth will get cheaper and more integrated into everyday care. It will become typical for patients to visit primary care physicians, for example, and interact with specialists via telehealth there without having to make separate visits. Also, it will become routine to record results of breast exams and other types of imaging and testing via telehealth. "We're starting to see the consumer version of telehealth where patients are taking their own vital signs at home and transmitting them over the Internet. The next step is to add computer diagnostics that consumers can do on their own."

Like the telephone itself, telehealth will become such an integral part of medicine that it will become practically invisible. Says Linkous, "If it works well it will be seamless—and it won't be considered telehealth."

