

## Telemedicine: Has Its Time Come?

by ERIC BERGER

*Special Contributor to  
Annals News & Perspective*

After a 30-year career as an emergency physician, working long shifts in bustling emergency departments (EDs), Jerry Jones finds himself easing into retirement. Leaning into a chair behind his large desk, he picks up a device that looks like a television remote control and aims it at a 20-inch television set. A moment later, from the comfort of Dr. Jones's 2-story home near downtown Houston, we're staring into the sick bay of a drilling ship somewhere off the coast of Saudi Arabia. It's midnight there, after a day when temperatures had reached 119°. Lounging on a cot, a paramedic is talking on the telephone for a few seconds before he notices the camera is active. He looks directly at us.

"Howdy doc," he says.

This is the modern version of telemedicine. Bolstered by ever-increasing computing brawn and the World Wide Web, Dr. Jones can practice medicine from behind his desk to all manner of oilrigs, deep drilling ships, and other vessels around the world, from Korea to a few miles off the upper Texas coast.

Technology is changing medicine in many ways, from putting iPads in physicians' hands to electronic medical records. But in recent years, technology has made one of the most profound changes by enabling telemedicine to be conducted efficiently and relatively inexpensively with reduced hardware costs and much faster connectivity.

According to the market research firm Datamonitor, the telemedicine industry has been growing by nearly 10% a year, reaching half a billion dollars in revenue this year.<sup>1</sup>

"The rate of growth has accelerated as technology has matured," said Jon Linkous, chief executive officer of the American Telemedicine Association.

As EDs deal with acute patient care, they may seem an unnatural setting for implementing telemedicine, and indeed no one is suggesting that physicians will be advising patients, through a telemedicine link, how to suture their own wounds or place a chest tube. But there are a surprising number of ways in which the spread of telemedicine may affect the ED soon and further into the future.

One way, of course, is how it allows Dr. Jones to transition from a hectic job in an ED—he still works in community clinics—to more of a desk job. Emergency physicians are seen as opti-

num candidates for such general practice telemedicine positions because of their broad range of diagnosis and triage skills.

"I carry a pager. It's nice because you don't have to stay sitting in front of a computer screen the whole time," Dr. Jones said. "It's not difficult work for the most part. I can fiddle around the home. I can read. I can watch TV. I can play the piano."

Dr. Jones works for a company called NuPhysicia, a start-up created in 2007 by Oscar Boultinghouse, MD, and 2 of his colleagues, Glenn Hammack, OD, and Michael Davis, MD. The company grew out of pioneering telemedicine work the trio did at the University of Texas Medical Branch at Galveston.

Dr. Boultinghouse arrived at the university in 1994 to establish an emergency medicine residency program, a time when the university had just signed a contract with the Texas Department of Criminal Justice to use telemedicine to care for 100,000 inmates, delivering care to 120 locations across the state. Intrigued by the concept, he eventually became medical director of the Center for Telehealth Research and Policy at the university. Three years ago, Dr. Boultinghouse sensed the time was right for telemedicine beyond the walls of an academic center.



## 'SOLUTION IN SEARCH OF A PROBLEM'

Telemedicine today is really just an exchange of information and always has been, Dr. Boultinghouse said. "You will see 20 patients, and each has 20 pieces of medical documents, so there was a lot of faxing and signing, and the whole concept really was just not scalable," he said. "But by 2007 all of the forces aligned; we were able to raise the private equity and spun the company out of the university. I think telemedicine has been a solution in search of a problem for 15 years, at least. Finally there are enough options out there in terms of technology and delivery of services that I believe we're going to see a dramatic growth over the next 4 or 5 years."

Among its programs, NuPhysicia helps companies establish an onsite clinic at the workplace, staffed by a paramedic certified in wellness and nutritional counseling. If care is needed, the paramedic can call a remote, on-duty physician such as Dr. Jones. Instead of losing a half day for a physician's visit to address a sinus infection or lapsed prescription, the employee can be back to work in less than an hour. The telemedicine link occurs over the Internet, like the connection to oil rigs and drilling vessels.

The 2-way video link between Dr. Jones and his patients is about the quality of standard definition television for land connections and slightly lower for land-sea connections. To hear a heartbeat, Dr. Jones puts on a headset. The paramedic can use a small scope with a camera attached, which allows Dr. Jones to peer into the patient's eyes, ears, nose, and throat.

"It's incomparable," Dr. Jones said. "It's an incredible improvement in terms of what I could see if I were standing in the room with the patient."

He misses the ability to put his hands on a patient, but the paramedics function effectively as a set of hands. They can perform basic tasks such as suturing or palpation of an abdomen. For offshore patients, the primary value of having Dr. Jones on call is to determine how soon a patient needs medical care. Is it urgent, or is it a true emergency? The cost of an emergency helicopter flight to the rig is \$10,000. So knowing whether that's nec-

essary or whether the patient can wait until the next scheduled flight makes a significant difference to a company.

## PAY PROBLEMS

Serving patients on oil rigs represents a niche of medical care, of course. But for various reasons, from technology to increasing acceptance by payers to health care reform, a range of physicians and telemedicine officials surveyed for this article believe telemedicine is on the cusp of reaching beyond niche care and well into mainstream health care. The primary hurdle to widespread deployment of telemedicine is simple enough: the need for a consistent reimbursement model.

"So far the reimbursement model for health care telepresence isn't there yet. A physician can't see a patient across a telepresence environment and get reimbursed by most systems," Jamie Coffin, Dell's vice president of health care and life sciences, told *InformationWeek* in April. "We are looking at it, and we are doing a lot of things around thinking about different modes of delivering health care to patients, but I would say we are not probably driving very much into the telepresence space yet because we don't think the market is there yet."

But Linkous, with the American Telemedicine Association, says that is changing. Medicare, Medicaid, and private insurers already reimburse for some services, such as teleradiology. And a dozen states—California, Colorado, Georgia, Hawaii, Kansas, Kentucky, Louisiana, Texas, Oklahoma, Maine, New Hampshire and Virginia—have now passed legislation that requires insurance companies to reimburse for telemedicine services delivered during interactive video sessions.

Health reform may also spur broader reimbursement; with the establishment of accountable care organizations, the federal government will essentially pay a lump sum for care of a patient and let providers decide how to deliver it, Linkous said. This should open the door for telemedicine, which can be a more economical way for physicians to dispense routine care and reduce the need for follow-up visits to a physician's office.

The increasing prevalence of smart mobile telephones may further acceler-

ate the deployment of telemedicine. That's the view of a study by Pike & Fischer,<sup>2</sup> a Silver Spring, MD-based research firm that predicts that the market for telemedicine devices and services will generate \$3.6 billion in annual revenue in 5 years. Of that, the firm finds, wireless applications, devices, and services will account for about 70% of this telemedicine market and that companies such as AT&T and Verizon will play major roles in the field. These new mobile tools, the report finds, will allow specialists to remotely triage, diagnose and monitor medical cases by viewing data and images conveyed wirelessly to their locations, and view medical records.

The changing and growing telemedicine market and increasing ubiquity of smart telephones will likely change emergency medicine in several ways. Foremost among the changes may be an increasingly sophisticated triage system that reduces unnecessary traffic into EDs. More than anything, this would be a convenience for patients trying to determine how sick they are and whether they require immediate attention or can wait until going to the physician's office the next morning. Nursing call centers have been around for decades, of course, but now, at a minimum, patients will add the ability to send a photo along with their query.

At George Washington University in Washington, DC, researchers are conducting a mobile wound care study to determine how accurate physicians are at making a diagnosis with a brief questionnaire, as well as an image of acute lacerations and soft tissue infections. So far the study has enrolled about 100 patients, said Neal Sikka, MD, an emergency physician who directs the Innovative Practice Section at the university's Department of Emergency Medicine. So far the study has found that about one fifth of the cases can be managed without a visit to the ED, he said.

The hospital also provides medical support for many of the high school tour groups that visit the Washington, DC, area, and a recent experience really highlights the potential of telemedicine, Dr. Sikka said. One participant in a Boy Scout troop visiting the area had a small rash that had gotten worse dur-

ing canoeing, but the leaders of the trip didn't want him to miss half his trip to the city by visiting the ED. Using their cell telephone link, physicians at George Washington were able to assess that the boy likely had an infection. He came in and received treatment for a serious illness.

"It would have been much worse if the boy had tried to hold on and wait for care until he got back home," Dr. Sikka said. "I think it's a really exciting time for telemedicine. This is a technology that's been around for a long time, but I think it's finally hitting its stride."

## PHONE PHOTOS

As espoused in the Pike & Fischer report, Dr. Sikka believes mobile technology may be the real game changer because it's so easy to use. For many patients, even a task such as setting up a Webcam at home may be too difficult. But virtually every telephone today includes a camera and the capacity to

e-mail pictures. He sees a host of uses for this, from augmenting nurse triage lines to eliminating in-person postoperative wound care inspections.

Telemedicine may even incrementally relieve some of the burden imposed by EMTALA on EDs for on-call specialists. According to Stephen Frew, coauthor of the EMTALA Field Guide, the effect likely would be only in rural areas.

"It would only be available in the limited context of rural areas designated as a rural health professional shortage area and those areas completely outside of a metropolitan statistical area, which covers a wide zone around moderate to large population centers," Frew said. "In most regions of the country, telemedicine would not be a compliant alternative for on-call specialties for EMTALA purposes and would probably not be reimbursed by Medicare even if allowed by EMTALA."

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# Nothing Gold Can Stay?

## *EMS Crashes, Lack of Evidence Bring the Golden Hour Concept Under New Scrutiny*

by ERIC BERGER

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On a steamy Harlem morning last July, an Acura blasted its radio while approaching the intersection of 125th Street and Seventh Avenue. As a result, the car's driver did not hear the sirens of an oncoming ambulance and broadsided the emergency vehicle, which was responding to a call in haste. Reacting to the Acura, the ambulance swerved and crashed into a city bus and Ford Expedition. Nineteen people were injured, requiring the services of several more ambulances.

A week later I telephoned Nadine Levick, MD, MPH, who told me she lives

about 10 blocks from the intersection where the crash occurred. An emergency physician who researches emergency medical services (EMS) transport, Dr. Levick has become a leading crusader for increasing information about the prevalence of ambulance crashes, increased oversight of EMS and slowing down ambulances on most emergency calls.

"The accident certainly highlights the issue," she said.

Dr. Levick's cause—a reevaluation of speed at all costs in delivering patients to the hospital—has gained ground in recent years as scientists have stepped up their investigations into the notion of a "golden hour," the time-honored idea that patients have the best chance of surviving a traumatic injury if they receive medical care within 60 minutes. In several

studies, scientists have accumulated a growing amount of evidence that time does not always matter when it comes to traumatic injuries.

The golden hour, it seems, stands on a foundation of less than rigorous scientific evidence.

The concept is most widely credited to famed trauma surgeon R. Adams Cowley, a pioneer in emergency medicine who spearheaded the creation of the nation's first statewide EMS system in Maryland.

Cowley originated the idea on a cocktail napkin in a Baltimore bar, said Bryan Bledsoe, DO, a professor of emergency medicine at the University of Nevada School of Medicine. A review of Cowley's writings, published in the July 2001 issue of *Academic Emergency Medicine*, found no scientific articles backing up his assertion about the significance of a single hour in the mortality of a patient.

"I write a widely used paramedic textbook," said Dr. Bledsoe. "In the latest edition, we changed the golden hour description to golden period to take the concept of an hour out. The bottom line is that we just don't know. Is 30 minutes better? Is 90 minutes OK? I think it