

Going wireless with your health care; Remote monitoring devices aim to prevent chronic-disease complications

March 4 2010, By Anya Martin

Each night before lying down to sleep in the cab of his semi, David Jesse straps a blood pressure cuff on his arm. The reading goes straight to his HealthPAL, a cell-phone-sized transmitter.

The HealthPAL, developed by Scottsdale, Ariz.-based MedApps, Inc., uploads the information wirelessly to Jesse's Microsoft HealthVault account, an online platform for health-data storage, which then sends it on to his electronic medical record at Cleveland Clinic, where any abnormalities automatically trigger a call from his doctor.

"If my doctor sees a spike in my blood pressure or if it's low, he can call me up, ask 'What's going on?' and decide whether to change my medication dose," said 47-year-old Jesse, a long-distance truck driver who has [high blood pressure](#) and only makes it home to Bedford, Ohio, once a month.

Knowing that the data can be transmitted wirelessly no matter where Jesse is in the U.S. also gives his wife Paula peace of mind, he said. "She gets email alerts saying what my blood pressure is, and if I don't send a reading I get a call from her."

Wireless health-care protocols, which industry insiders also call mobile health or mHealth, promise to make home-health technology more user-friendly, portable and real-time. They also have the potential to improve

health results while saving patients and the health system money if insurers will pay, proponents say.

"This is the year that wireless health services will break out into the consumer market," said Brian Dolan, editor and co-founder of MobiHealthNews.com, a daily online news Web site covering the wireless health industry. "I wouldn't say that we're going to see mass adoption this year, but there's going to be an introduction of wireless health to the masses."

IMPROVING MANAGEMENT

By early 2012, Americans will use about 15 million wireless health-monitoring devices, according to a forecast from ABI Research, which tracks mobile technology trends. The mobile health market is projected to more than triple to \$9.6 billion in 2012 from \$2.7 billion in 2007, according to study from Kalorama Information Inc.

Jesse received his HealthPAL as part of the first pilot project in the nation to assess whether the use of remote digital devices with data sent over the Internet to a doctor's office improved management of multiple chronic diseases -- diabetes, heart disease and high blood pressure, also known as hypertension.

Administered by Cleveland Clinic in partnership with Microsoft, the pilot has followed 255 participants for periods ranging from three months to just over a year. Of them, 129 used HealthPALs to upload blood pressure, blood sugar, weight and/or heart-rate readings, depending on their conditions. Another 126 used non-wireless devices such as a home computer with a broadband modem.

While the study didn't meet the rigorous scientific standards of a clinical trial, initial results announced March 1 do suggest that patient remote

monitoring with data sent over the Internet to health providers could improve disease management and warrants more research, said Dr. C. Martin Harris, Cleveland Clinic's chief information officer.

Diabetics and hypertensive patients increased the number of days between appointments by 71 percent and 26 percent respectively, suggesting they had better control of their conditions, he added.

"One of the great promises of wireless (health) is making it a part of the patient's daily life, not an interruption to what they're doing every day," Harris said.

Before joining the free program, Jesse kept a written notebook of his blood-pressure readings, but being on the road during business hours made it hard to call them into his doctor's office, he said.

Meanwhile, heart-disease patients in the pilot visited their doctors 27 percent more often, suggesting that continuous heart-rate assessment was more likely to identify anomalies that required medical intervention.

Those latter results are consistent with a 300-patient clinical trial by Conshohocken, Pa.-based CardioNet, Inc., of its Mobile Cardiac Outpatient Telemetry, a home wireless product which monitors a patient's heart rate for arrhythmias, or abnormal rhythms. The trial showed MCOT to be nearly three times more effective at identifying cardiac arrhythmias than prior technologies.

PAGING THE PATIENT

Two weeks after starting use of MCOT last November, Donald Bakken, of Surprise, Ariz., received a call from a CardioNet technician saying that the device had detected a six-second pause in his heartbeat and he should proceed immediately to the emergency room. Within a few days,

the now-73-year-old was in surgery being fitted with a pacemaker.

"Because CardioNet was monitoring me 24 hours a day, they were able to find these strange things that happen where my pulse would drop and pause," Bakken said. "I think that if they wouldn't have found it, it might have paused forever."

Bakken could move anywhere in his home while wearing the mobile device, which consists of three Band-Aid-sized electrodes taped to his chest, then clipped to three wires that fed into a sensor on his belt. The latter transmitted the data wirelessly to a small portable monitor, which uploaded the data to a monitoring center.

More examples of mHealth products either available or under development include handheld ultrasound monitors and fall-prevention tools smart enough to dial for help even if the wearer has lost consciousness.

While this first generation of wireless health devices transmits readings to your doctor's office via a dedicated device, in the future, all these functions likely will be performed by your smartphone, said Dr. Eric Topol, a cardiologist and chief medical officer of West Wireless Health Institute, a San Diego, Calif., nonprofit medical research group that researches mobile-health technologies.

"You'll put a wristband on like a watch and (your vital signs) will continuously be going to your phone," he said.

The biggest barrier to widespread wireless health use, however, is uncertainty about who will pay for applications and devices, said Kenneth E. Thorpe, executive director of the Partnership to Fight Chronic Disease. By and large, insurers will look to Medicare, the largest national payer for health services, to take the lead in setting payment

rules, he said.

Market forces favor preventive strategies such as mHealth devices if they can be clinically proven to reduce costs and improve outcomes, Thorpe said. Between 1987 and 2006, Medicare spending increased by \$320 billion, and about one-third of those costs went to treat five common chronic conditions -- diabetes, hypertension, high cholesterol levels, kidney disease and arthritis.

PAYMENT WOES

Investment in clinical trials was crucial to assure a viable profit model for MCOT, and positive research results were pivotal in convincing Medicare and several national insurers to cover up to 30 days of mobile cardiovascular monitoring when prescribed by a physician, said Randy Thurman, CardioNet's chief executive and chairman of the board.

More than 300,000 patients nationwide have used MCOT, and multiple companies are developing wireless heart-rate monitoring devices. But the industry suffered a setback when Highmark Medicare Services, the company that is the administrative contractor for Medicare in Pennsylvania and four other states, cut its reimbursement rate for mobile cardiovascular technology by 33 percent from \$1,123 to \$754 in September of last year.

CardioNet now is making a case to the Centers for Medicare and Medicaid Services, the federal agency which administers the program, to set a national rate that provides higher reimbursements to cover MCOT's development and implementation costs, Thurman said.

Still, not all insurers are waiting for Medicare. Blue Shield of California currently pays for home-health monitoring tied to a grounded phone line in certain doctor-prescribed circumstances, and is watching the evolution

of mHealth applications, said Dr. Andrew Halpert, the insurer's senior medical director.

Blue Shield of California hopes to be able to roll out cell-phone-friendly, disease-management services, such as medication reminders that include a picture of the pill in the near future, he said

"The technology is there now, but it's a matter of integrating it into our programs and getting members to use it," Halpert said.

Indeed, user-friendliness, especially for notoriously tech-shy seniors, is a necessity for wireless home-health applications to pay off in improving health results, said David Inns, chief executive of San Diego, Calif.-based Jitterbug, which specializes in easy-to-use cell phones and wireless services.

"For mHealth to work in the older population, it's going to have to work right out of the box with no downloading of applications," Inns said.

Jitterbug is keeping its first health offerings simple, he said. Products include LiveNurse, which connects customers to 24-hour registered nurses, and "Samsung in Red" cell phones, which send out daily heart-healthy tips from the American Heart Association.

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