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Medical Advances—Through Your iPhone?

Researchers are beginning to understand how mobile phones can cut costs, help solve rural health-care problems, and even reduce medical errors

by Olga Kharif

Bioengineering professor Boris Rubinsky has what he hopes is the perfect antidote to bulky, expensive, hard-to-use medical machines: the mobile phone.

The University of California professor says that by reducing a complex electromagnetic imaging machine to a portable electromagnetic scanner that can work in tandem with a regular cell phone and a computer, he has essentially replicated a $10,000 piece of equipment for just hundreds of dollars. The mobile scanner plugs into the phone, which beams the data to the computer, generating an image that can be transmitted to a doctor or hospital far away.

Despite all the advances in medical diagnostics, two-thirds of the world's population has no access to imaging technologies. Worse, about half of the imaging equipment sent to developing countries goes unused because local technicians aren't trained to operate it or lack spare parts, according to the World Health Organization. But thanks to the proliferation of cellular and other wireless networks, researchers are stepping up efforts to deliver crucial medical services from afar. "You go through India, anywhere, in the middle of the road, there's someone with a cell phone. A friend calls me from the jungles of Costa Rica," says Rubinsky. "I can see so many applications in which the cell phone becomes an integral part of a medical device. A cell phone can cut the cost of almost every [diagnostic] device."

From Ultrasounds to Heart Monitors

Rubinsky is hardly the only medical researcher who sees this potential. Indeed, of some 30 health-care-related projects at various universities recently funded by Microsoft (MSFT) Research, 17 involve cell phones. One team, at Washington University in St. Louis, is attempting to take ultrasound readings using a cell phone and a TV. Scientists at the University of Pittsburgh are working to create a heart monitor that relies on a cell phone to analyze the readings and dial 911 whenever a person's cardiac activity careens into dangerous territory, providing emergency responders with a location and a preliminary diagnosis. "The cell phone is going to solve rural health-care problems,

whether it's rural India or rural Indiana," says Kristin Tolle, Microsoft Research's program manager for external research in biomedical computing.

Cell phones may also help reduce the frequency of medical errors. Researchers at startup Gentag have developed disposable wireless Band-Aids containing radio frequency identification (RFID) chips that transmit key information to a cell phone. As a nurse is about to administer a drug, the Band-Aid may warn that the patient is allergic to it. The Band-Aids, expected to be introduced commercially in Europe this summer, can also enable a phone to monitor a patient's temperature or glucose levels, alerting a nurse if there's a spike.

Apple's (AAPL) hit iPhone, with its large color screen and full Web access, has been a boon for some graphics-rich medical applications. A software company called Life Record is using the iPhone to help physicians view patients' medical records, including electrocardiograms and brain scans, on the go. "Since the iPhone release, our business has quadrupled," says Michael Pike, Life Record's chief software architect. Doctors can also use Life Record to order prescriptions, an area where many medical errors occur. With the iPhone spurring more handset makers to introduce similarly robust devices, the U.S. market for medical cell-phone software is expanding rapidly. Sales of phone applications for medical professionals are expected to rise from $111.8 million last year to $276 million in 2011, according to consultancy Ambient Insight.

Medical Record-Keeper

Consumer versions of mobile medical software may also see a boost. This June, Life Record plans to introduce an application that will allow individuals to have access to their own medical records via an iPhone for $50 a year. When visiting a new doctor or specialist, iPhone-toting patients will be able to pull up all of their medical information, including past X-rays and another physician's notes, by connecting with Life Record's servers over the Internet.

Cell phones can also play an integral role in remote care for patients with chronic illnesses. BeWell Mobile, based in San Francisco, has created an application that lets asthma or diabetes sufferers enter their home test results into their cell phones and send them to the doctor daily. If a patient's glucose levels spike, the software suggests the patient hold off on certain foods or try a different medication. Or a doctor may call the patient with more personal recommendations.

A recent two-year trial with BeWell at clinics operated by San Mateo Medical Center in California has shown the software can drastically cut down on emergency room visits. The trial involved 50 asthmatic patients, ages 12 to 20, who had previously landed in the ER four to five times a year. But using BeWell, none of the participants came to the emergency room during the trial. "We can actually change patients' behavior, and that's the big breakthrough," says Peter Boland, business development director at BeWell.