

## Knowledge on call: Finding new uses for smartphones

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By Pam Dolan

If Dan Diamond, MD, leaves for work in the morning and forgets his white lab coat -- it's no big deal. But if he forgets his iPhone?

"I either go home and get it ... or I have a family member bring it to me. It's as important as the stethoscope," said Dr. Diamond, a family physician from Silverdale, Wash.

Many physicians like Dr. Diamond are finding that personal digital assistants and smartphones – mobile phones with advanced features such as built-in PDAs, Internet access and customized applications -- not only keep them connected but also can serve many functions in the practice of medicine.

According to New York firm Manhattan Research, doctors are adopting mobile technology more quickly than is the general public. The group published a report in September 2008 saying 54% of U.S. physicians own a PDA or smartphone. Separate research by Dallas-based Diffusion Group predicts that by 2011, 70% of physicians will own a smartphone or PDA.

That compares with only about 20% of physicians who have adopted electronic medical record systems, though there's hope that increased smartphone use will raise that number. Already, developers are creating EMRs that operate from a cell phone.

"We see a major shift, almost a revolution, coming like a tsunami to all physicians, which will really change the role of mobile phones from gadgets to one of the most prized aids and companions to physicians," said C. Peter Waegemann, CEO and president of Medical Records Institute, a Boston-based Health IT research and consultancy firm.

Part of the cause for the penetration is the fact that cell phones, which initially were designed to simply make and receive calls, have become so technically advanced that it's more difficult to find a cell phone without smart features than one with them. And once physicians have the phones, the applications are easy and inexpensive to adopt -- many are free or cost only 99 cents.

"The reason I jumped on it ... is because I wanted to have more information at the point of care, but I didn't have room for a wheelbarrow in the exam room," Dr. Diamond said.

Manhattan found in its research that drug references are the No. 1 function accessed by physicians who use smartphones and PDAs. But that certainly isn't the only application available. If a resource is available in paper form, chances are it's available for the smartphone.

Medical calculators, normal lab value charts, decision-support tools and EMRs are available for download. Netter's Anatomy Flash Cards are available in electronic form and can be downloaded onto phones for \$39.99.

Russ Horowitz, MD, emergency medicine physician at Children's Memorial Hospital in Chicago, has several medical applications downloaded onto his iPhone. He said the handheld system saves him at least an hour each shift. With his iPhone, he can prescribe a medication, look for side effects or interactions, find out if the medication is covered under the patient's insurance and tell the parents how much the prescription will cost, all without leaving the exam room.

Dr. Diamond, who also uses several applications, said staying at the patient's bedside while seeking information makes patient visits more efficient. Because he doesn't have to leave the room to look up formularies or dosages, he can answer almost any patient question on the spot, even if it requires some research.

Erika S. Fishman, director of research for Manhattan Research, wrote in an e-mail to AMNews that one potential downside to the handheld devices is that "some consumers may be uncomfortable and miss the traditional doctor-patient roles of face-to-face interaction without a 'third-party' device."

But some users say that hasn't been the case.

"[Patients] love that I admit I don't know everything, but also that I use technology effectively to find the answers I need," Dr. Diamond said.

Michelle Snyder, spokeswoman for Epocrates, a widely used drug reference application, said an internal survey found 80% of physicians with Epocrates were using it during patient visits, and most say their patients feel more confident because the doctors are looking up information.

### **Improving technology**

Epocrates is one of many companies adapting their products. It started nearly a decade ago with providing online data to download before recently offering its product on smartphones.

Another example is Modality. CEO and founder S. Mark Williams, PhD, an adjunct faculty member in the Dept. of Neurobiology at Duke University, developed a CD-ROM several years ago that dissected the brain, giving the terminology and a brief description of each function. As technology evolved, the CD-ROM application turned into a Web-

based application that then turned into a mobile application in 2005. Modality now has nearly a dozen applications for the iPhone and iPod Touch, including Netter's Anatomy, and has about a dozen more in development.

"Students study within very limited windows of time," Williams said. "In my day, you had to lock yourself in the basement for several hours. I'm not sure that happens anymore." Because mobile devices can carry literally an entire medical library, learning can occur anywhere the student is. Williams said his "eureka" moment was the day a student told him he had learned five new brain terms while waiting in line for his latte.

Williams said the applications also are used by practicing physicians for patient education. "That was something we did not anticipate," he said.

Because of the enhanced memory, access to a wireless network and even wireless reception are no longer issues, as the applications are able to live on the phones as opposed to being Web-based applications, which require Internet access. But wireless access is crucial for another advanced feature of the devices: no more syncing.

Many applications provide the latest information or research crucial to patient care, and physicians no longer have to search for updates or sync their PDAs to their stationary computers to receive them. With newer mobile devices, updates are sent automatically to the user when they are released.

### **An essential tool**

Dr. Horowitz believes the use of mobile devices in medicine will continue to grow. Students coming out of medical school have never known life without a cell phone. And there also has been a trickle-down effect, he said.

Dr. Horowitz, 38, in his third year as an attending, said residents seek him out for consults because they can send images or reports to his iPhone. He said it's useful for teaching because he quickly can send links or articles he wants a resident to review.

His iPhone has become such a staple of his daily routine that when he forgot it one day, "I felt powerless."

According to Fishman, more than half of physicians who use a handheld device claim the device is "essential" to their professional practice.

"And since the time and cost of integrating mobile devices into a practice is much less steep than other technologies, such as electronic medical records, mobile use will continue to spread throughout the medical field," Fishman wrote.

According to Waegemann, the growth of mobile clinical applications for physicians is expected to surpass the growth of EMRs. The institute has been working on driving EMR

adoption for 25 years. By 2012, use of EMRs and clinical cell phone applications are both expected to be about 30%.

Waagemann and Fishman agree that mobile devices will foster adoption of EMRs and other health IT. "Efficiency gained from mobile-device use can help physicians realize other technology can streamline the day as well," Fishman says.

Waagemann said the development of technology that works in conjunction with mobile devices will help speed up adoption of EMRs. For example, patients can now store continuity of care records on their cell phones and send them to physicians' offices ahead of any visit. In the absence of an EMR, that record would go to a fax machine, which would cause more trouble, he said.

"Access to information is what separates good care from great care," Dr. Diamond said. "And I want to deliver great care."

## **ADDITIONAL INFORMATION:**

### **Popular applications**

The top five paid, and free, downloads from Apple's iPhone App Store include:

#### **PAID**

Medical Abbreviations: List of 1,600 common medical abbreviations (\$0.99, QD Ideas LLC)

Medical Terminology and Abbreviations: Commonly used abbreviations and medical terms (\$1.99, Phantom Particle)

ACLS: Quick reference for advanced cardiac life support algorithms (\$4.99 Marketwall.com)

The Human Body 2: A frequently updated, illustrated encyclopedia of the body (\$2.99, Jose Barrientos)

Medical Calculator: Helps physicians and nurses compute formulas and equations (\$0.99, Marketwall.com)

#### **FREE**

Epocrates Rx: Drug reference (Epocrates)

Skyscape Medical Resources: Drug information, medical calculators, disease and symptom outlines, and medical news feed (Skyscape)

ReachMD CME: Continuing medical education content (MedicinePhone)

MedCalc: Medical calculator (Mathias Tschopp & Pascal Pfiffner)

Eponyms for students: List of 1,600 common and obscure eponyms, with descriptions (Pascal Pfiffner)