

August 2012

Mobile Technology for Diabetes Care High-tech options may usher in a new era of interactivity

By Erika Gebel, PhD

The thing about cell phones is that, for the most part, they're always with us. They've revolutionized our lives, connecting people across the globe. Some 85 percent of U.S. adults have cell phones, and 7 out of 10 use text messaging. As phones have gotten smarter, the possibilities have grown. One area of rapid growth is mobile health, which may be a boon for people with diabetes, who are likely to benefit from care that goes everywhere.

Health to Go

Mobile health, as defined by the National Institutes of Health, uses mobile technologies as tools and platforms for health research and delivery of care. Most often the technology is a cell phone, though blood glucose meters can also qualify (more on that below). Mobile technology allows users to send information, such as results of blood glucose tests, to a centralized program that manages, tracks, and responds to data. While there are a variety of diabetes apps that can basically act as mobile logbooks, the crucial characteristic of this new wave of mobile-health technologies is their responsiveness.



"The opportunity in mobile health is providing people with actual feedback," says Charlene Quinn, PhD, RN, an assistant professor of epidemiology and public health at the University of Maryland. "It's not just collecting information." The feedback can come from a health care provider or a computer program that analyzes the patient's information and provides pertinent motivational and educational messages.

There isn't much good data yet on the effectiveness of mobile-health technologies, but the best study to date had some encouraging results. The July 2011 study in *Diabetes Care* tested cell phone-based software, produced by WellDoc, on 163 people with [type 2 diabetes](#). The participants sent phone messages about glucose levels, exercise habits, or taking medication to the program and then received personalized responses from either a computer program or provider. By the end of the one-year study, those in the mobile-health program had lowered their [A1Cs](#) by 1.9 percentage points while those of people receiving usual care had dropped by 0.7 percentage points. This would be considered a success if it were a medication, says Quinn, who coauthored the study. The WellDoc software is only available through health care providers.

Texting

You can access a variety of websites and apps for diabetes management through a computer or cell phone, but those are things you have to "go and do," says Paul Meyer, president of Voxiva, a company that has developed text-messaging services that aim to improve health. The advantage of text

messaging, Meyer says, is in the numbers. “The reasons we are big believers in text messages is that 99 percent are read and most are read within three minutes. Less than 40 percent of e-mails are ever read,” says Meyer. “That means when you remind someone to take their medication, there’s a 90 percent chance they will read it within three minutes.” Voxiva is just one of several companies and organizations developing texting services for health.

Voxiva’s service for smokers, text2quit, is similar to a British program, txt2stop, that helped people quit smoking at twice the rate of a control group, a 2011 study in *The Lancet* reported. The company also offers a free program called text4baby that sends texts about pregnancy and caring for infants. A version for people with [gestational diabetes](#) is in development, Meyer says. For people with diabetes, Voxiva has care4life, but right now the service is available only through diabetes educators.

“When you sign up for care4life, you basically enter in things like what medications you’re taking, how many days a week you want to exercise, or what your goal weight is,” says Meyer. Then you can opt to get reminders to help you achieve your goals. “A text will ask, ‘Did you remember medication today, yes or no?’ or ‘How many days did you exercise this week?’ If you missed your exercise goal, it says, ‘Let’s do better next week.’”

Users can also text blood glucose levels to the program, which will time-stamp the measurement and send it to a centralized Web portal. Users can log on and view all their health information to look for trends. Meyer says Voxiva is doing two studies to determine whether care4life can make a real difference in blood glucose levels, weight, and other health measures.

Beyond the Cell Phone

Just this year, the Food and Drug Administration approved the first wireless [blood glucose meter](#) with the technology to automatically send blood glucose measurements directly to a Web portal for storage and analysis. The meter, Telcare, is itself a type of mobile-health tool. Another recently approved mobile-health device is the AgaMatrix blood glucose meter iBGStar. It attaches to an iPhone, allowing a mobile app direct access to blood glucose measurements. Data can be shared with a doctor, accessed by a parent of a teen with diabetes, or used exclusively by the patient.

Devices such as the Fitbit fall under the umbrella of mobile health, tracking physical activity levels and offering support. Further afield, Quinn says, articles of clothing that can track vital signs like blood pressure are being developed to make health monitoring even easier. “This whole movement of mobile health is changing the way people communicate about themselves,” she says. “It’s just going to get more sophisticated.”