



Manage Your Diabetes With Your Cell Phone

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Researchers at the University of Maryland School of Medicine are studying the effectiveness of an interactive computer software program to help patients manage their Type 2 diabetes using their cell phones.

The software, designed by a Baltimore company, WellDoc Communications, Inc., provides real-time feedback on patients' blood sugar levels, displays medication regimens and serves as a "virtual coach." For example, a patient's blood sugar test results can be sent wirelessly from a blood glucose monitor to the cell phone. If the level is too low or too high, the software on the phone will prompt the person to take steps to correct it. The system also analyzes blood sugar levels and other patient information and sends computer-generated logbooks and suggested treatment plans to the patients' primary care doctors.

Charlene C. Quinn, Ph.D., R.N., an assistant professor of epidemiology and preventive medicine at the University of Maryland School of Medicine and the principal investigator, says many diabetes patients struggle to manage their disease. Only 37 percent of those with Type 2 diabetes meet the guidelines for controlling their blood sugar, and only 7 percent meet the combined blood glucose, lipids and blood pressure goals.

"We tell patients that they can meet these goals if they eat a healthy diet, exercise daily and take their medication as directed, but we don't really give them the tools to do that," says Dr. Quinn, who works in the Gerontology Division of the Department of Epidemiology and Preventive Medicine.

"This study looks at whether this cell phone-based system will help them control their blood sugar levels and better manage their diabetes. We hope it will reduce the number of trips to the doctor or emergency room for diabetes-related problems. We also will look at the benefits to primary care doctors to see if the system saves them time and helps them better care for their patients. This system may provide them with data about their patients they might not otherwise receive."

People with Type 2 diabetes either do not produce enough insulin to convert sugar into energy or their cells ignore the insulin. A key measure of blood sugar control is the amount of hemoglobin A1c in a

person's blood. A1c is a molecule in red blood cells that binds itself to blood sugar. The higher the level of sugar in the blood, the higher the level of A1c.

"An A1c test provides a snapshot of a patient's average daily blood glucose levels over the previous two to three months. The American Diabetes Association recommends that a person's A1c be less than or equal to 7 percent," Dr. Quinn says. "The majority of people in the United States with Type 2 diabetes have an average level of more than 9 percent, which greatly increases their risk for complications such as heart disease, stroke, blindness and kidney failure."

A pilot study, conducted by the University of Maryland Department of Epidemiology and Preventive Medicine and WellDoc Communications, showed that patients who used the cell phone-based system experienced an average two-point drop in their A1c within 90 days. According to WellDoc, each one-point drop in A1c can reduce the risk of complications by up to 40 percent.

Dr. Quinn says researchers plan to enroll 260 patients in the new clinical study over the next year and are enlisting the help of primary care doctors in Baltimore County, Baltimore City and Anne Arundel County to recruit participants. So far, 35 physicians have agreed to take part in the study. Patients will remain in the study for a year.

To qualify, patients must be under 65 and have poorly controlled diabetes, private health insurance and access to the Internet. According to Dr. Quinn, study participants will be divided into four groups. Three groups will receive cell phones loaded with the WellDoc software, some with the most basic features and others with the most sophisticated features, and the fourth group will serve as a control group. People in that group will receive a free blood glucose meter.

All of the participants may receive a free hemoglobin A1c test if they haven't had a recent test.

In addition to cell phones, the WellDoc system uses secure Web servers for data storage, statistical models for data analysis and Web portals for patients and physicians to access information. All patient data is handled in accordance with federal patient privacy laws.

WellDoc Communications, Inc. and CareFirst BlueCross BlueShield are sponsoring the study. Part of the funding comes from a grant from the University of Maryland's Maryland Industrial Partnerships program, which funds research and development projects between companies and University of Maryland faculty members.

WellDoc Communications is a Baltimore company founded in 2005 by Suzanne Sysko Clough, M.D., an endocrinologist who specializes in treating patients with diabetes. Dr. Clough is the former medical director of the Center for Weight Management and Wellness at the University of Maryland Medical Center.