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When Smart Mobile Technology Meets Good Science

Tablets, smartphones, and mobile apps have the potential to improve patient care--but without quality clinical research to back them up, you may be wasting your IT budget.

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By Paul Cerrato

A recent *New York Times* article listed several mobile IT tools worth looking into, including a small blood glucose meter that plugs into an iPhone or iPod Touch, a blood pressure cuff that attaches to a smartphone, and a phone app that reminds patients to take their medication.

But when I was interviewed for this *Times* story, one point I thought worth mentioning was that the best mobile health tools are supported by strong clinical research.

One example: WellDoc's DiabetesManager. In a year-long study, Charlene Quinn, MD, and colleagues from the University of Maryland school of medicine found that patients who had access to the WellDoc mobile app for treatment and behavioral coaching lowered their glycated hemoglobin (A1c)--a measure of long-term blood glucose control--significantly more than those who received care only during occasional doctor visits and through self management.

During the trial, patients were divided into four groups: A control group received traditional, office-based care; another group was given WellDoc coaching and a secure Web portal so they could communicate with their physicians; a third group used the WellDoc system and their doctors could see data that the patients entered; and a fourth group used WellDoc and worked with physicians who had clinical decision support that linked data to standards of care and evidence-based care guidelines.

All patients in the study used glucose meters. Those in the three experimental groups also received mobile phones with service and data plans, plus the WellDoc mobile diabetes management software that delivered more than 1,000 self-management messages, as specified by an algorithm that considered factors such as blood-glucose levels, medications, and carbohydrate consumption. The Web portal included personal health records for reporting diabetes-related information such as test results.

The study, which was published in the September 2011 issue of the journal *Diabetes Care*, found that the group whose doctors had access to clinical decision support saw their A1c levels decline by 1.9 percentage points, while patients in the control group had a median reduction of only 0.7 percentage points. Patients in intermediate groups, who also used the WellDoc system, likewise saw significantly better blood glucose readings, when compared to the control group.

A more recent mobile technology experiment reported in the *Archives of Internal Medicine* also emphasized the value of good research support.

Bonnie Spring, a researcher at Northwestern University, along with colleagues from several other universities, gave more than 200 adults with poor nutritional habits and a sedentary lifestyle Palm Pilots loaded with nutritional software and tools to monitor food intake.

Using CyberSoft's Nutribase software and accelerometers, which patients wear to track physical activity, subjects monitored their activity level, along with their intake of saturated fat, fruits, and vegetables. They

also received coaching via phone and email from trained assistants on how to improve their nutrition and exercise habits.

The "mobile therapy" worked. Patients more than tripled their daily fruits and vegetables, and sedentary leisure activities significantly decreased. Mobile tools like this can have a major impact on patient outcomes because they serve as "physician extenders."
Given the limited amount of time the average physician has to see patients, it's impossible to provide the kind of detailed lifestyle advice so urgently needed by many patients with nutrition- and obesity-related disorders. Prescribing these kinds of research-driven mobile interventions can have a real impact on quality of care and costs.