



New Smartphone Software Provides Groundbreaking Opportunity for Medical Research *By M. Maggie Lester*

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Smartphone applications ("app") are saturating the health care world in numerous and various ways. There is an app to track your sleep, one to track your heart rate, one to track steps and even one to measure your blood pressure. The prevalence of this technology is allowing consumers to utilize an inexpensive and convenient method for getting healthy and staying healthy. Now, iPhone users have the opportunity to become a part of groundbreaking research and sign up for medical research studies through an app on their iPhone. Last week, Apple announced that its new software, ResearchKit, will provide researchers with a platform to develop apps that will be used for clinical studies.

This technology is the first of its kind and researchers are extremely excited about the opportunities this software provides. The key component for any medical research is data, and this new software promises plenty of it. Currently there are over a million users of IOS software across the globe. Right now, the software is only available in the United States on the iPhone 5, iPhone 5s, iPhone 6, iPhone 6 Plus and the latest generation of iPod touches, so some critics worry that the sample size will necessarily be limited to those who can afford these devices. However, even though the studies are limited to iPhone users, that number is still larger than any number medical researchers have been able to reach before. Accordingly, the implications from these studies could be significant for health care providers and patients alike.

Apple worked with research institutions like UCLA's Jonsson Comprehensive Cancer Center, Stanford Medicine, University of Rochester, Icahn School of Medicine at Mount Sinai and Massachusetts General Hospital. These institutions then developed five different apps that will collect data in the following areas:

- (1) asthma;**
- (2) breast cancer;**
- (3) cardiovascular health;**
- (4) Parkinson's disease; and**
- (5) diabetes.**

In developing this software, Apple has implemented a requirement that each institution developing an app must comply with the laws of the territory in which the app will be used and must also obtain approval from an institutional review board (otherwise known as an IRB). Users may sign up for the apps via electronic signature on their phones. Research institutions utilizing the ResearchKit software

are able to develop an interactive consent form for users. Additionally, users are able to control what information is sent to the app in order to alleviate privacy concerns.

The ResearchKit software works by allowing the institutions to develop apps that can track disease signs and symptoms right from their iPhones. Take, for example, the University of Rochester's app for patients with Parkinson's Disease, called Parkinson mPower (Mobile Parkinson Observatory for Worldwide, Evidenced-based Research). Parkinson mPower allows patients to take a proactive approach to managing their disease by allowing them to actively participate in the study and receive frequent feedback on their condition. Typically Parkinson's patients visit their doctors every six months, and their trajectory is based on those two visits. With the Parkinson mPower app, patients are able to track their disease day-by-day and week-by-week which gives researchers a more accurate way to measure users' symptoms on a consistent basis. By receiving the data from a larger number of people and on a more consistent basis, researchers will be provided with a better understanding of the disease which will hopefully result in better patient care.

The app will perform a variety of functions to test and monitor users' symptoms and motor skills. For instance, there is a function that allows the user to say "Ahhhhh" and the app will measure the user's tone, pitch and the presence of any tremors. Researches maintain that tremors found in a user's voice are an accurate way to gauge the severity of Parkinson's symptoms. There is also a function that will measure the user's gait when walking. Additionally, there are "games" that track motor skills and dexterity exercises that users may perform. In addition to providing a better understanding of the disease, the app also allows users to monitor their symptoms and to keep track of how any medication or exercise effects those symptoms.

Another research institution, Stanford University, has launched an app for cardiovascular health. Through the app, MyHeart Counts, Stanford is hoping to conduct the largest study of cardiovascular health to date while also learning what modification behaviors actually impact a person's cardiovascular health and well-being. The app will utilize the iPhone's built in motion sensors to track and collect data on the user's physical activity. Additionally, users will be allowed to enter information regarding their heart health and any risk factors they may have for heart disease.

The Parkinson mPower app and the MyHeart Counts app are just two examples of the forerunners of this technology. While users might be unaccustomed to this technology right now, there is no doubt that it is an exciting time for medical researchers and the subjects they study. Proponents of this new technology believe that it will redefine how we think about health care and that the results from these studies will ultimately have a significant, positive impact on people's lives.

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