

How Hospitals Can Use Mobile Health Device Technology to Better Care for Patients

The Journal of Mobile Technology in Medicine (JMTM) agrees that mobile health technology is a step in the right direction for the field healthcare. Some of the benefits, they say, include fostering a sense of patient efficacy, increasing the accuracy of patient self-reporting, and improving medication compliance. The devices can also provide vital data that enables physicians and patients to partner together, ultimately allowing them to make more informed healthcare decisions and improve patient outcomes.

This technology has already begun to change the landscape of hospital culture because it gives physicians and clinicians the ability to access a wealth of important patient information in new ways, and in some cases on-demand and in real time. If your hospital or organization hasn't yet jumped on this trend, maybe it's time to take a look. There are a wealth of potential benefits to mobile health devices that, when implemented properly, have the potential to dramatically improve patient outcomes as well as a physician's ability to provide appropriate care.

Spotlighted in this article are four different types of mobile health devices and a discussion of how they can help physicians have a better relationship with, and better care for, their patients.

Fitness and Wellness Devices – Tinké

One of the cutting edge mobile fitness devices on the market is *Tinké*, an optical sensory device that measures heart rate, respiratory rate, blood oxygen levels, and heart rate variability. Consumers love it because it is compatible with the iPhone, iPad, and Samsung Galaxy. They also enjoy being able to self-monitor with a simple touch of the thumb on the sensing platform.

But with regards to improving treatment outcomes, the possibilities could be remarkable. *Tinké* is an absolutely free application (essential for tight budgets) that can give doctors important information such as:

- Long- or short-term monitoring of heart rate variations, blood oxygen saturation, and respiratory rate
- A snapshot look at resting heart rate based on historical data
- A graphical view of patient data over time, helping identify improvements or a worsening of symptoms
- The ability to share results with other physicians or family members through the *Tinké* network

The data can be exported to an Excel spreadsheet for easy inclusion into electronic health records, or printed out for patient charts to offer a hard copy version of historical trends. And the accuracy of *Tinké* is commendable:

- Heart rate: +/- 2 beats per minute
- Respiratory rate: +/- 2 breaths per minute
- Blood oxygen saturation: +/- 3%

Because it is based on mobile technology, *Tinké* can give patients a constant lifeline to their physician. This technology is especially important after discharge or implementation of a maintenance plan, because patients can now continue their own care and take charge of their health by committing to the *Tinké* monitoring program. The doctor can quickly pull up readings and get a more accurate picture of

their patient's overall health, and the patient can rest assured that their doctor has the best information available to make the right decision for care.

EKG Heart Monitoring – Cardiac Designs

For patients and doctors looking for an FDA-approved mobile device to help monitor heart health, Cardiac Design's *ECG Check* fits the bill. Compatible with iPhone 4S and 5, the application turns a phone into a powerful heart monitor that records and analyzes heart rhythm on demand.

The monitor attaches to the back of an iPhone just like a protective case and then records and stores single-channel electrocardiograms that are sent wirelessly for analysis. The patient simply places their finger on a sensor – no electrodes or special devices are required.

For physicians, this mobile device could be groundbreaking. It has the potential to:

- Eliminate the cost of an electrocardiogram test (which can be prohibitive for many patients)
- Reduce the need for patients to regularly come to a specialized facility to check for heart rate abnormalities (which burdens the healthcare system and is also cost-prohibitive)
- Empower patients to monitor their own heart health and create a partnership with their physician(s)
- Allow doctors to engage in preventative medicine more often by catching symptoms early

For only \$99, this portable device uses a free application (the ECG Check app, available in the iTunes store) to gather heart data and transmit it to the company's ECG Web Center, where it is analyzed for arrhythmias or other abnormalities. Results are returned in just seconds, alerting the patient of problems and also giving physicians access to important historical information for their heart patients.

One of the greatest benefits of the *ECG Check* is that it can detect atrial fibrillation, which is essential in helping doctors reduce the risk of stroke. So it really is a win-win for everyone – for the patients, for the doctors, and for the healthcare system as a whole – as long-term heart monitoring moves into the patient's hands and out of the doctor's office.

Pulse Oximeters – Reflectance Medical and Nonin

Reflectance Medical and Nonin both offer mobile pulse oximeters that give doctors a noninvasive method of monitoring arterial hemoglobin oxygen saturation and pH. These devices produce a real time reading of SmO₂ and pHm as well as historical data to show trends over time.

Reflectance Medical offers a multi-parameter sensor that automatically performs SmO₂ and pHm readings every 30 seconds. Some of the benefits of their device include:

- It requires no patient measuring or calibration
- It works for all skin pigmentations
- It plugs directly into a patient monitor or smart display with a USB cable or Serial interface

Nonin, a leader in medical monitoring, also offers finger pulse oximeters with optional wireless transmission of SmO₂ and pHm data. Some of the benefits of their devices include:

- They can be used for patients of all ages – from infant to adult
- They can be used on fingers, thumbs, or toes

- They offer optional Bluetooth® technology to wirelessly transmit readings to physicians
- They are scientifically proven to work while in motion and for all skin pigmentations, including dark skin and low perfusion
- They come in two versions – one requiring a prescription (a medical device) and one for recreational use (for sports and fitness enthusiasts)

Mobile pulse oximeters offer a lower cost, easier way for patients with sleep apnea, heart problems, COPD, anemia, lung cancer, or pneumonia to have their conditions properly monitored by their doctors using equipment that they can take with them to the comfort of their homes. This technology is an amazing advancement in helping doctors better monitor oxygen levels and offer proper treatment for their patients regardless of physical location.

This device, like most other mobile devices, helps remove the burden of cost-prohibitive and sometimes unnecessary visits to the hospital to ensure patients remain stable. The physician intervenes only when a problem arises, making it a wonderful maintenance tool for patients who have been discharged from inpatient care or who are being moved to a new location.

Stroke Detection – Strohl Medical’s NeuroEPG™ System

Although millions of people visit the emergency room each year with stroke-like symptoms, hospitals know that only a small percentage of them are actually having a stroke.

Strohl Medical has developed a mobile, FDA-approved “EKG-like” testing device called the *NeuroEPG™ System* that gives doctors a cost-effective method of quickly detecting stroke through objective neurophysiologic data. This device allows physicians to better determine who should receive the t-PA treatment within the crucial 4 hour window by providing key data in mere seconds. Statistics show that less than 5% of the patients who need this treatment receive it in time to reverse the damage, and this device has the potential to eradicate this devastating statistic.

The device only requires a one-time investment in the unit (around \$18,000) and then a very marginal investment in disposable kits that can be used for each patient (around \$250 each). In the end, the total cost for hospitals to run the test is estimated at about \$300, with insurance companies reimbursing at \$355. This is an acceptable profit margin that creates a mutual benefit for patients and hospital systems, because it means that:

- Patients can be diagnosed quickly, treated properly, and administered the lifesaving t-PA drugs they need
- Hospital systems can eliminate unnecessary costs for the millions of patients who mistakenly think they are having a stroke

Some of the other benefits of this new technology include:

- Easy set-up by a tech, nurse, or anyone else who might need to do it
- Quick results that can be effortlessly handed off to the doctor for interpretation

Much like cardiac defibrillators have made their way into offices and other public locales, this device has the potential to become the next wave in emergency medical testing and to become more commonplace due to its mobile nature. The technology offers the potential to make a significant

difference in the numbers of patients who live or die because it offers an accurate detection method that quickly separates true stroke patients from the rest.

Learn More

Interested in learning more about the technologies spotlighted in the article? Browse our website to purchase a mobile device or application, or peruse our product listings to learn more about the multitude of options available in advanced mobile health device technology.