

mHealth Gives Home Health a Whole New Meaning



One of the most exciting trends in modern healthcare can be found at the intersection of two larger societal changes: the shifting demographics of an aging Baby-Boomer population, and the fast adoption of smart mobile devices and mobile application platforms. As robust, secure and intuitive mHealth applications are adopted, patients are more empowered to monitor and share their health data outside of a traditional medical office or hospital setting. As healthcare delivery system already short on providers becomes even more taxed, mHealth applications will allow the system as a whole (patients, caregivers, loved ones, and payers) to navigate health decisions in a more efficient and informed way.

This quote from the Deloitte Center for Health Solutions 2010 Survey of Health Care Consumers says it all:

“Boomers view tech-enabled health products as a way to foster control and ongoing independence for themselves, especially in light of the rise in incidence in chronic disease with aging, and their desire to reduce costs. Nearly 56% of boomers show a high willingness to use in-home health monitoring devices in tandem with care of their primary physician.”

What are the advantages of pushing home health medical data from the source to the care provider?

- Minimum lag time between data collection and the clinician's ability to review it.
- Reduction in errors associated with human intervention in data entry.

- Intuitive and simple interfaces promote active patient involvement and caregiver communication in healthcare management.
- Secure sharing of PHI (Protected Health Information) with patient, family members, and approved internal and external stakeholders in health.

Here are just a few of the companies and products available now (or in the near future) that might change your mind about where and how health data is captured and shared. Each of these products automates the capture of health data and the transfer of the data in a usable format to an Electronic Health Record.

Near Field Communications

NFC (Near Field Communications) is a wireless technology that allows for quick transfer of data between two sensors that are fairly close (an inch or two) together. The secure transfer allows for seamless data tracking inside caregivers' workflow. For example: medical supplies, drugs, injectables and fluids can be fitted with low cost sensors that are swiped past a patient's sensor to indicate they will be administered to the patient, and then again past the provider's sensor to indicate a finished procedure, capturing time of administration, dosage, and patient information without slowing down the care to enter this critical data by writing them down, typing them in, or just resolving to remember them for later entry.

Gentag makes the data sensors and applications that manufacturers can use to send data via cell phone to the hospital or physician for seamless inclusion in the electronic medical record (EMR). Monitoring of blood pressure, fever, weight management and urinalysis are just a few of the ways Gentag has improved data capture in healthcare.

iMPak Health makes a cholesterol monitor the size of a credit card that accepts a small blood sample to process for

triglyceride levels. The data is uploaded wirelessly to a cell phone that transmits it to a health provider.

Smart Fabrics and Wearable Monitors

Researchers at the Universidad Carlos III de Madrid in Spain developed a fascinating concept for an “**Intelligent T-Shirt**” that uses sensors woven into a washable fabric to create a hospital garment that does more than preserve the patient’s modesty. The sensors in the fabric can detect and record temperature, bioelectric impulses (for ECG monitoring), as well as the patients location, current resting position, and level of physical activity.

Copenhagen Institute of Interaction Design graduate Pedro Nakazato Andrade has designed a dynamic cast called **Bones** that collects muscle activity data around a fracture area by using electromyographic (EMG) sensors to report the patient’s progress to physicians automatically. This could reduce the need for follow-up visits and imaging, or change the specifics of rehabilitation.

The **Basis Band** is a wristwatch-type accessory that monitors heart rate by directing light into the skin to image blood flow. It also uses a heat sensor for skin temperature changes, an accelerometer for recording movement and activity, and sensors for galvanic skin response. The band also gives customers access to a free, web-based health dashboard to oversee the data the device collects and transmits.

There are still some considerable hurdles to full adoption of mobile home health monitoring. Very few patients use only one medical device, so not only do monitoring devices need to work with networked EHR technologies, they have to be integrated with each other to present a comprehensive picture of health to providers and Health Information Exchanges (HIEs). Also, as patients navigate the system of generalists, specialists, and emergency care providers, the possibility of encountering

multiple software and hardware platforms will require flexible, integrated solutions that can run on any device. As with any networked application of sensitive data, security and availability are major factors in a success deployment. Unless patients can count on the privacy of their data, and providers can count on the uptime of their software, healthcare systems won't be able to realize the full benefit of mHealth installations. On top of that, more monitoring of patient health means that there will be even more data to be collected on each patient, and on the population as a whole. While more data means more opportunity for large scale research and analysis for the public benefit, it also means more data has to be secured and protected as a part of the health record, requiring even more security and storage resources. And finally, the Food and Drug Administration will have a large say in the future of mHealth application development through industry regulation. Device makers and application developers will certainly have to work within a governmental framework which will have a large say in the time-to-market of many possible products.

With all that being said, the opportunity to meet the demographic challenges of an already stressed healthcare system with mobile home health monitoring and Electronic Health Records will be one of the major themes of the future of both the health and technology industries.