The Future Of Wireless Medical Devices

Globally there are more than a billion overweight adults, of whom at least 300 million are clinically obese. Both these conditions are major risks in the development of chronic diseases including type 2 diabetes, cardiovascular disease and certain types of cancer. The global population is also getting older— the proportion 60-year-olds or above is projected to grow from 10 percent in 2005 to 21 percent by 2050.

With an upward trend in chronic diseases and an ageing population, more and more people in the West are being encouraged to take preventative measures to self-manage their health and wellbeing. This represents an opportunity for companies to develop a range of medical devices and services that empower individuals to manage their own healthcare. An important aspect of this is better connectivity and communication between both patients and their care providers, and between devices. For the latter, a number of leading healthcare and technology companies have already come together to collaborate and steer future solutions within this area.

For example, the Continua Health Alliance, an open industry alliance of global healthcare and technology companies, is working towards improving personal healthcare and fitness by building a compatible communications platform and an ecosystem of interoperable medical devices.

As part of this collaboration, a number of companies— including Cambridge Consultants—are developing platforms that will enable the next generation of medical devices to connect seamlessly to one another. These platforms will act as enabling tools to integrate the devices with co-developed systems, promoting the transition of care beyond the hospital and doctor’s office to the consumer’s home and beyond.

The services that will be on offer as a result will range from disease management and monitoring products that can track vital signs such as heart rate, blood pressure, blood oxygen levels and blood sugar or cholesterol levels, to fitness-promoting products and gaming platforms that can monitor activity and performance as part of an online personal training system.

As part of this ecosystem of interoperable devices, medical devices can also communicate with consumer electronic products, with data sent wirelessly to a mobile phone, personal computer or dedicated health hub. Putting Health 2.0 into practice, results can be uploaded and stored online in electronic health record systems such as Google Health and Microsoft HealthVault, accessible by the individual and authorized care providers in remote locations, enabling a more efficient exchange of health and medical information.

One of the first types of service to emerge from within this developing field plays to the need to get people more physically active. For example, MiLife is an online, personalized coaching system that uses the MiBand, a wristband containing a three-way accelerometer, to continuously track an individual's activity levels throughout the day. The user's physical activity data is captured along with weight measurements from a set of Bluetooth®-enabled weight scales, and is transmitted wirelessly via a personal computer to the individual's online personal health record. In this way, time-poor individuals are motivated to increase their overall level of activity throughout each day, and to track their progress online at a time that suits them, setting personal goals in relation to a community of other users. Cambridge Consultants' own Continua-compliant Vena platform will enable a host of similar systems over the next few years.

While fitness devices represent the tip of the wireless medical iceberg, it is likely that the majority of future developments will be in the arena of chronic disease management. A good example of how this is likely to pan out is the GlucoPhone from HealthPia and LG Electronics, which provides the ability for diabetes sufferers to connect a blood glucose monitor with their mobile phones. Test results are sent and recorded on an online database, which is accessible to authorized care providers who can monitor the patient's blood sugar levels and provide advice or therapy where due.

Home telecare for the elderly is a third area where wireless-enabled devices can play a significant role. Philips' Motiva is a remote patient monitoring system that connects patients with chronic conditions to their care providers through a home television and broadband internet connection. By interacting with their care providers and receiving personalized feedback, patients become better informed about their condition. This in turn gives them the support and motivation needed to become more active in managing their health.

For the healthy and 'worried well', innovative incentives can provide the encouragement and motivation required to be more proactive in adopting disease-preventing behavior. Prudential Health Vitality, for example, is a rewards program that encourages and supports an individual's effort to look after their health. By leading a healthy lifestyle, an individual accrues Vitality points which can be used to lower their health insurance cover.

Rising healthcare costs have the potential to limit the adoption by healthcare providers of the relatively expensive new technologies developed to treat the chronically ill and elderly. For these to succeed, the cost benefits—like reducing hospitalization rates and treatment times, for example—will need to be made clear.

This is a health system level objective, but it is achievable. For example, Philips' HeartStart MRx monitor and defibrillator system enables paramedics to wirelessly transmit the 12-lead ECG data of a suspected heart attack patient while they are transported to the hospital, allowing the hospital team to triage the patient before they arrive. Percutaneous coronary intervention and thrombolytic therapy can be administered as appropriate. By enabling the hospital team to carry out several steps in parallel with patient transport, the 'door-to-balloon' treatment time can be

significantly reduced.

In summary then, connectivity technologies and online health record systems will be key enablers in a number of emerging wireless medical devices and services, empowering individuals to take a more active approach to their health. Further developments will aim to optimize integration of these products within a range of care settings, from the hospital to the home. Although global health and age trends will drive interest and demand, the success of these products depends to a large extent on cost-driven decisions within healthcare systems. Widespread development and systemic adoption will take time, and further evidence will be required to demonstrate the cost benefits in detail. What is clear though, is that a significant and diversified wireless medical market is emerging, providing a great many opportunities for device developers, and a great many benefits for the users.

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