

# Chapter XXXVIII

## Remote Patient Monitoring in Residential Care Homes: Using Wireless and Broadband Networks

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### **ABSTRACT**

*The UK's National Health Service (NHS) is undergoing great reform. Driven by a demand for higher quality health care provision, information and communication technologies (ICT) are increasingly being used as tools to realize this change. We have investigated the use of remote patient monitoring (RPM), using wireless and broadband networks, in three community care homes between July 2003 and January 2006. The aim of the project was to determine for what conditions and in which setting the RPM was most useful and to establish an organizational and clinical infrastructure to support it. Evaluation of the project demonstrated clinical benefits such as the early detection of cardiac events, allowing prompt intervention and routine monitoring of other conditions. A change in work practices resulted in a more collaborative approach to patient management and led to an increase in communication between health care professionals from different sectors, as well as the establishment of protocols for seeking advice. Technically, the equipment largely met the users' needs. In conclusion, the monitoring proved a useful tool for the management of chronic diseases and has great potential to contribute to the reform of the NHS.*

## **INTRODUCTION**

The UK's National Health Service (NHS) has been and continues to be subject to major change. Driven by an increase in expectations, together with an aging population and the availability of new medical technologies (Department of Health, 2006), the government presented its vision for reform of the NHS in the NHS Plan in 2000. The main themes of this plan were to: (1) develop a service that would offer prompt and convenient care; (2) enable rapid access to diagnosis and treatment in modern facilities; and (3) give patients the choice over the time, place, and personnel involved in their treatment (Department of Health, 2001). Central to the plan was the creation of the National Program for IT (NPfIT), the largest IT program in the world. A national data spine and a national broadband network (N3) were designed to connect health care providers to a central secure system (Calkin et al., 1999) and support many e-health initiatives. These initiatives include the electronic patient record, repeat prescription, choose and book, as well as help with profiling, clinical governance, and reuse of data (Department of Health, 2002).

e-health is an umbrella term and can be defined as "the application of information and communications technologies (ICT) across the whole range of functions which, one way or another, affect the health of citizens and patients" (Maheu et al., 2001). This ranges from medical applications such as telemedicine, remote patient monitoring, and electronic patient records to telecare and beyond to tools that empower patients such as health Web sites.

The objectives of this chapter are to:

- Inform the reader about the potential of ICTs to reform health care
- Demonstrate the application of ICTs in form of a specific e-health case study
- Discuss future trends in the area

The case study, e-Vital, was a feasibility and market validation project providing remote patient monitoring (RPM). The UK element of the project investigated the use of RPM in two residential

care homes and one nursing home. The work was novel in that it exploited new forms of technology, wireless and broadband networks, to provide the communication infrastructure to small health care organizations.

## **BACKGROUND**

As the number of elderly people in society continues to grow, so do the health care costs associated with this section of the population and the need to find a means for efficient and effective provision of health care. Continued aging of the population is inevitable during the first half of this century, as the relatively large number of people born after the Second World War and during the 1960s baby boom become older (British National Statistics: Ageing, 2005). Chronic disease is more prevalent among the elderly, with almost 75% of the over 65 year-olds suffering from at least one chronic disease, while nearly 50% have two or more (Calkins, Boulton, & Wagner, 1999). Many require frequent medical attention, both in a clinical environment and at home. As a result of cost-issues, over-crowded hospitals, and the preference of elderly people to remain in their normal environment, there has been a trend to move away from hospital-based health care to home-based health care (Maheu, Whitten, & Allen, 2001).

The UK government has been actively promoting home-based health care as part of its program to move services into the community (Wistow, 2000). It has recently made available 80 million pounds for preventative technologies over a 2 year period (TeHIP, 2005). It is speculated that with the provision of home care services, patients can live in their usual environment for longer, thus avoiding the hotel costs of hospital; the patients' own care-givers can provide no-cost nursing; and the actual costs of primary care are often lower than the equivalent service provided from hospital (Hersh et al., 2002).

## **Remote Patient Monitoring**

RPM can be defined as the monitoring of physiological measurements in a setting other than a

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