

## Chapter 83

# Home Telecare, Medical Implant, and Mobile Technology: Evolutions in Geriatric Care

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### ABSTRACT

*With a rapidly expanding global aging population, alternatives must be developed to minimize the inevitable increase in acute and long-term care admissions to the health care system. This chapter explores the use of home telecare as an alternative medical approach to managing this growing trend, while also providing superior care to geriatric patients. To address some of the emergent disadvantages of home telecare concerning usability, self-management, and confinement to the home, the use of a cardiac implant in conjunction with a mobile device—to assist in the management of chronic heart failure in seniors—is proposed as a promising technological solution to overcoming these limitations. Ultimately, it seems that the growth of home telecare, as well as the great potential to enhance its services with the use of mobile wireless technology, stands to drastically improve clinical decision-making and management of health services in the future.*

### INTRODUCTION

We are living in an era when the world's aging population is rapidly expanding. In the year 2000, 600 million people were aged 60 and over, with this number projected to increase to 1.2 billion in 2025 and 2 billion by the year 2050 (WHO, 2006).

At this rate of growth, the inevitable increase in acute and long-term care admissions is a significant concern for policymakers, managers and providers of health care. Concerns arise from the increased economic cost, as well as the potentially lower standard of care that is likely to result from a higher volume of patients seeking treatment in

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an over-burdened system. Currently, international trends indicate that health care needs increase as people become older, and that the number of people requiring *daily* health care over the age of 85 is now four times more than those aged 65 to 75 (Botsis et al., 2008). One proposed solution to managing this problem is home telecare – a sub-specialty within the larger field of telemedicine. This involves a shift in care with the use of new and emergent information technology in the home, utilizing an array of hardware, software and network services (Roback & Herzog, 2003). With this system, patients can be monitored, consult with their physicians, and receive care without physically leaving their private homes; thereby allowing them to maintain their independence, more conveniently and efficiently manage chronic conditions, and ultimately reduce health care costs to the system (Hébert et al., 2006; Koch, 2006).

In this chapter, we examine the growing arena of home telecare and assess its potential to enhance treatment and clinical decision-making in geriatric medicine. Following a review of important facets of home telecare, as well as a discussion of the advantages of this medical technology for policymakers and patients, we then outline the challenges that arise with this system, proposing the use of an implantable device—under the skin—as a means through which to increase convenience and overcome user-related challenges for seniors with chronic Heart Failure (HF). The use of a cardiac implant in conjunction with mobile wireless technology is a potentially promising solution that addresses some of the emergent challenges of home telecare concerning usability, self-management, and confinement to the home. This proposed technology would allow seniors in chronic HF, and under the monitoring of a home telecare system, to leave their home while maintaining a similarly comprehensive level of medical monitoring and management for their condition. Ultimately, it seems that the growth of home telecare, as well as the great potential to enhance its services with

the use of mobile wireless technology, stands to drastically improve clinical decision-making and management of health services in the future.

## **BACKGROUND**

Telemedicine refers to the delivery of medical care—and the sharing of health knowledge—from a distance with the use of telecommunication devices, the Internet, and various monitoring technologies (Allen & March, 2002; Hersh et al., 2002). Home telecare operates on the same premise, allowing health care practitioners to manage and treat patients in their homes from a remote location (Celler et al., 2003; Coughlin et al., 2006). Services encompass a wide array of technologies, including “virtual visiting, reminder systems, home security, and social alarm systems,” all of which support the larger goal of home telecare: to manage the care of geriatric patients where they live, and avoid lengthy stays in hospitals or nursing homes (Magnusson, 2004, pp. 224-225). It is a method of health care delivery that addresses many of the existing gaps and weaknesses in the current primary health care system, by providing a higher level of monitoring and medical consultation for patients in their everyday lives. The services provided by this branch of telemedicine are meant to increase convenience for patients, their families, and practitioners, where a higher level of patient autonomy and independence is supported, while also enhancing clinical management and decision-making.

Much of the strength in this system lies in the ability to extensively record and monitor patient data electronically. Clayton and Hripcsak (1995) suggest that the availability of patient information in an electronic format has been one of the most valuable and widely used Decision Support Systems (DSS) in health care. With patient information stored and tracked through home-based DSS, clinicians can potentially make more informed

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