Chapter 4.6
The Use and Evaluation of IT in Chronic Disease Management

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ABSTRACT

This chapter describes the broad array of information technologies currently used in programs that manage individuals with chronic diseases and discusses evaluation strategies to assess the impact of implementing programs that incorporate such technologies. More specifically, it describes the three components of a chronic disease management program and then details the technologies commonly used in each component. Three evaluation designs well-suited to measure DM program effectiveness are also discussed. The intent of this chapter is to educate readers on the range of approaches to incorporating information technology into chronic disease management and the most appropriate evaluation designs that will strengthen the understanding of which approaches are most successful.

INTRODUCTION

This chapter examines the use and evaluation of a broad array of information technology that is used in the outpatient management of individuals with chronic diseases such as diabetes, heart failure, and asthma. While chronic diseases are typically managed in traditional health care settings alongside acute conditions and preventive

care, there is growing consensus that chronic diseases merit special focus. This has led to the establishment of *disease management* as a distinct and systematic approach to managing chronic diseases (Ofman et al., 2004). Disease management has been defined as "an approach to patient care that emphasizes coordinated, comprehensive care along the continuum of disease and across health care delivery systems" (Ellrodt et al., 1997). In practice, an array of activities falls under the broad term "disease management". Nonetheless, well accepted approaches to disease management exist; one such approach, the chronic care model, integrates community resources, health system organizations, and self-management with the aid of decision-support and clinical-information systems (Wagner et al., 2001). This model delivers multidisciplinary, evidence-based care and offers patients the education and tools required to manage their disease(s). The chronic care model is rooted in the assumption that care for chronic diseases can only be improved by systems of care and that information technology plays a critical role in supporting these systems. Thus, a comprehensive understanding of the tools that are currently incorporated into disease management and strategies for their evaluation are essential for any effort to improve care for those with chronic diseases.

CHRONIC DISEASE MANGEMENT AND INFORMATION TECHNOLOGY

As the burden of chronic disease escalates, it has become clear that health care systems designed to deliver acute care do not meet the needs of the chronically ill population (McGlynn et al., 2003). Chronic conditions require ongoing, multi-disciplinary care that includes more frequent patient contact to assess changes in clinical status. Chronic conditions also require unique forms of care, such as patient education on self-management. In addition, assessments take place at both the patient level to inform the management of individual

cases, and at the population level to identify trends that should be addressed systematically. These three characteristics create substantial opportunity for information technology (IT) to improve the efficiency and effectiveness of chronic disease management efforts.

Many stakeholders have responded to the evidence that chronic care requires improvement. In the United States, the system with which the authors' are most familiar, a billion-dollar commercial industry has emerged, which offers stand-alone programs designed to address current shortcomings in chronic care; commercial health insurers as well as the Medicare and Medicaid programs have contracted with these companies to manage their members with chronic illnesses (Linden & Adler-Milstein, 2008). In parallel, traditional health care delivery systems are rethinking how to deliver care that meets the needs of the chronically ill population. As a result, a variety of stakeholders currently sponsor disease management programs. An individual care provider or medical group can initiate a program to manage the chronically ill patients in their panel. A private or public/government payer can implement a program to manage their chronically ill members or beneficiaries; this can be done by the payer itself or by contracting with a third party vendor to provide this service. Finally, integrated delivery systems and staff model Health Maintenance Organizations like the US-based Kaiser system can offer disease management. The type of sponsor influences the program structure and the associated IT tools that are incorporated. For example, a provider-sponsored program can leverage an electronic medical record system to support the program while a payer-sponsored program may not have access to this clinical technology.

The variety of stakeholders pursuing disease management has fueled the development of IT tools used to support these efforts. In disease management, IT tools both facilitate the use of large volumes of data in everyday patient management and assist in the data collection process

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