

# Chapter 1.9

## Benefits and Barriers to Adoption of Information Technology in U.S. Healthcare

**James G. Anderson**  
*Purdue University, USA*

### ABSTRACT

Information technology such as electronic medical records (EMRs), electronic prescribing, and clinical decision support systems are recognized as essential tools in all developed countries. However, the U.S. lags significantly behind other countries that are members of the Organization for Economic Cooperation and Development (OECD). Significant barriers impede wide-scale adoption of these tools in the U.S., especially EMR systems. These barriers include lack of access to capital by healthcare providers, complex systems, and lack of data standards that permit exchange of clinical data, privacy concerns and legal barriers, and provider resistance. Overcoming these barriers will require subsidies and performance incentives by payers and government, certification and standardization of vendor applications that permit clinical data exchange, removal of legal barriers, and convincing evidence of the cost-effectiveness of these IT applications.

### INTRODUCTION

Information technology has been proposed as an essential tool in solving the problem of fragmented and inaccessible clinical information (Kohn, Corrigan & Donaldson, 1999). The current largely paper-based system adversely affects both the cost and quality of health care as well as compromises patient safety (Leaning, 1993; Dick & Steen, 1997; President's Information Technology Advisory Committee, 2004a,b). Information technologies (IT) such as electronic health records, e-prescribing, clinical decision support systems, electronic management of chronic disease, and bar coding of drugs and biological products have been proposed as ways to reduce health care costs and improve patient safety (Agency for Healthcare Research and Quality, 2001; Aspden, Corrigan, Wolcott & Erickson, 2004). For example, a Rand study estimated that the potential savings of widespread adoption of EMRs in the U.S. could be as much as \$81 billion annually (Hillestad, Bigelow, Bower et al., 2005). However, critics question these estimates arguing that the reality of health care practice in the U.S. will make it difficult

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to realize savings of this magnitude (Goodman, 2005; Walker, 2005; Himmelstein & Woolhandler, 2005; Miller, West, Brown et al., 2005).

As many as three quarters of a million people are injured or die each year from adverse drug events (ADEs) (Bates, 1996; Lazarou, Pomeranz & Corey, 1998). It has been estimated that adverse drug events (ADEs) occur in from two to seven out of every 100 patients admitted to a hospital in the USA (Bates, Cullen, Laird, et al., 1995; Classen, Pestotnik, Evans, Lloyd, & Burke, 1997). The annual cost of morbidity and mortality due to drug therapy in 1995 for the U.S. may be as much as \$76.6 billion. (Bates, Spell, Cullen, et al., 1997; Johnson and Bootman, 1995).

ADEs also occur among outpatients. One study estimates a rate of 5.5 per 100 patients (Honigman, Lee, Rothschild, et al., 2001). Another analysis of hospital emergency departments in the U.S. estimated that ADEs account for 2.4 out of every 1,000 visits (Budnitz, Pollock, Weidenbach, Mendelsohn, Schroeder, & Annest, 2006).

Information technology has been shown to be effective in preventing serious medication errors (Anderson, Jay, Anderson & Hunt, 2002; Bates, Evans, Murff et al., 2003a,b; Bates & Gawande, 2003). A review of research of the effects of computerized physician order entry (CPOE) and clinical decision support systems (CDSSs) on medication error rates found evidence that both CPOE and CDSSs can substantially reduce medication error rates (Kaushal, Shojaania & Bates, 2003). Also electronic prescribing has been shown to reduce prescription errors and improve compliance with managed care formularies (Galanter, Didomenico, & Polikaitis, 2005). Point-of-care decision support tools can provide providers with alerts for contraindicated medications (Miller, Gardner, Johnson & Hripcsak, 2005).

A number of countries that are members of the Organization for Economic Cooperation and Development (OECD) have experienced widespread implementation of information technology. The Harvard School of Public Health

and the Commonwealth Fund's International Symposium survey of primary care physicians in 2001 found the following use of electronic medical records among primary care physicians: U.S. (17%), Canada (14%), Australia (25%), New Zealand (52%), and the U.K. (59%). The use of electronic prescribing by primary care physicians was: U.S. (9%), Canada (8%), Australia (44%), New Zealand (52%), and the U.K. (87%) (Harris Interactive, 2001). Only three OECD countries, Portugal, France and Spain lag behind the U.S. (Harris Interactive, 2002).

By 2006, the gap between physicians in the U.S. and other OECD countries had widened. Table 1 shows the results of a survey of U.S. primary care physicians (Anderson & Balas, 2006). Overall only about one out of four primary care physicians reported that they had implemented electronic medical records or clinical decision support tools in their practices. Even fewer physicians surveyed reported using electronic prescribing (20.1%) in practice. Internists were the most likely to have implemented these information technology tools in their practices; obstetricians and gynecologists were the least likely.

When compared to the results of a recent study of primary care physicians in seven countries (Australia, Canada, Germany, New Zealand, the Netherlands and the U.K.), the U.S. continues to trail European countries in the use of information technology in patient care. U.S. physicians were the least likely to have clinical information systems in their offices; while ninety percent or more of physicians in the Netherlands, New Zealand and the U.K. use electronic medical records in their practices (Schoen, Osborn, Huynh, Doty, Peugh, J. & Zapert, 2006). The majority of physicians in these countries also reported routinely using electronic prescribing and electronic access to test results. In contrast our survey found that only 28% of U.S. physicians reported using EMR; 20% used electronic prescribing of medications; and 22% accessed test results electronically. The functionality of these EMR systems varies

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