

Chapter 36

Computer Physician Order Entry (CPOE): Benefits and Concerns – A Status Report

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ABSTRACT

In an effort to reduce Adverse Drug Events (ADEs) and to improve patient safety, funding has been earmarked to improve the rate of adoption of Computerized Physician Order Entry (CPOE) among healthcare providers. It has been shown that the ordering stage of medications is where most medication errors and preventable ADEs occur. The purpose of this study was to examine the implementation CPOE systems in hospitals to determine benefits and concerns of this technology in the United States healthcare system. A review of the literature published in the last 13 years (since 2000) in the English language was performed to complete this investigation. CPOE has emerged as a valuable tool to improve medical efficiency and to decrease medication errors and ADEs. Efficiencies were found to reduce the overall workload of nurses, clerical workers and pharmacists. CPOE has proven to be a secure way of transferring physician orders electronically thus helping hospitals and physicians practice a more effective and better quality of care with less medical errors which has led to decreased operating expenses. While barriers such as lack of professional buy in, and cost of implementation have hindered the widespread use and growth of CPOE systems, these barriers are being overcome with the financial incentives from the HITECH Act, and with the increased savings of CPOE implementation, which may motivate more healthcare systems to adopt CPOE.

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INTRODUCTION

Medical errors are a major problem in the United States because of their overall costs to the health-care system and effects on quality. An estimated 200,000 US citizens die from preventable medical errors, almost two times the amount reported by the Institute of Medicine [IOM] over 10 years ago (Hearst Corporation, 2009). The IOM also reported in 2000 that about 98,000 citizens died each year due to medical errors, and one million people were injured annually (Kohn and Corrigan, 2000). In 2001, the IOM released another report, *Crossing the Quality Chasm: A New Healthcare System for the 21st Century*, which called for fundamental changes within the United States healthcare system to better deliver uniform quality healthcare. The IOM have suggested improvement in six key areas: safety, effectiveness, patient-centered, timeliness, efficiency, and equality (IOM, 2001).

Despite much debate surrounding the accuracy of mortality estimates, general agreement exists that prescription transfer errors are frequent, costly, and often preventable (Kaushal, et al., 2001). Landrigan et al. (2010) reported that about 18% of patients in 10 North Carolina hospitals were harmed resulting from medical care. In a 2010 report, The Office of the Inspector General of the United States Department of Health and Human Services found that one in seven Medicare patients were hurt during hospital stays and adverse events during the progress of care contributed to the deaths of 180,000 patients each year (Levinson, 2010).

Computerized Physician Order Entry (CPOE) entails the provider's use of computer assistance to directly enter medication orders from a computer or mobile device. The order is also documented or captured in a digital, structured, and computable format for use in improving safety and organization (CMS, 2010). CPOE and Computerized Decision Support Systems (CDSSs) are promising interventions that target the ordering stage of medications where most medication errors and preventable

Adverse Drug Effects (ADEs) have occurred (Kaushal, Shojania, & Bates, 2003; Riedmann, et al., 2011). CPOE has allowed physicians to enter orders directly into a computer rather than handwriting them. By design, CPOE can eliminate illegible handwriting; avoid transcription errors; improve response time, accuracy and completeness; and improve coordination of care. Several outcome categories to assess beneficial outcome variables include: laboratory testing ordering, radiologic test ordering, medication errors, antibiotic patterns, clinical support systems, and dosing appropriateness (Kuperman and Gibson, 2003; Ash, Berg, and Coiera, 2004). Most all systems have a basic CDSS which may include suggestions or default values for clinically based best practices such as drug doses and frequencies. More refined CDSSs can perform drug allergy checks, drug-laboratory value checks, drug-drug interaction checks, in addition to providing cues about corollary orders (e.g., prompting the user to order blood pressure checks after ordering a beta-blocker) or drug guidelines to the physician at the time of drug ordering (Shojania, Duncan, & McDonald, 2001; Hagland, 2011).

In the immediate future many Health Information Technology (HIT) systems are expected to be implemented as result of the mandate of the for Economic and Clinical Health (HITECH) Act, which is a part of the American Recovery and Reinvestment Act of 2009 (ARRA). HITECH directs \$20 billion towards the implementation of such technologies as the Electronic Medical Record (EMR), the Electronic Health Record (EHR), and CPOE by 2014, and also provides guidelines for "Meaningful Use" for reimbursement and quality measurement of how this HIT is implemented and used (Blumenthal, 2009; Hoffman & Podgursky, 2011). HITECH is a federal investment in computerized infrastructure and digitization of health records in an effort to reduce medical errors and to lower overall costs (Recovery Gov, 2012). Among the leading legal components to address medical errors is the requirement of Eligible Providers (EP)

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