



Patient Safety Primer & Fact Sheet

Introduction

Although there are reports that as high as 24% of physicians utilize an electronic health record, that number drops to between five and nine percent when the system is described as “fully operational”, consisting of computerized physician order entry, computerized nursing documentation and bar-coding patient identification with an electronic medication administration report, and a computer-based medical record¹.

The majority of hospitals have a paper-based patient chart system, based off of a format that was developed over 100 years ago by the Mayo brothers. Physicians continue to manually write orders to care for patients contributing to paper-based systems that are inefficient and fraught with errors.

Research findings – Patient Safety Issue

Advisory Board Research:

What types of medical errors are there in hospitals?

The most common errors per 1,000 visits are:

- 65 incidents due to adverse drug events
- 60 incidents due to hospital acquired infections
- 51 incidents related to procedural complications
- 15 incidents related to falls

The National Center for Vital and Health Statistics

What are the problems with hand written physician orders?

- 78% have illegible signatures
- 58% have missing order time
- 24% are incomplete
- 20% are illegible

The cost of the medical error problem:

Adverse Drug Events (ADEs) are responsible for \$2 billion per year nationwide in hospital costs alone.² Dr. David Brailer estimated that a national health information infrastructure can save about \$140 billion per year through improved care and reduced duplication of services.³

The healthcare industry and HIMSS believe that clinical technologies have the ability to reduce errors, improve efficiencies and enhance quality.

¹ *Health Affairs*, 25, no. 6 (2006): w496-w507 doi: 10.1377/hlthaff.25.w496)

² *David Bates (Bates DW, et al. JAMA. 1997;277(4):307-11)*

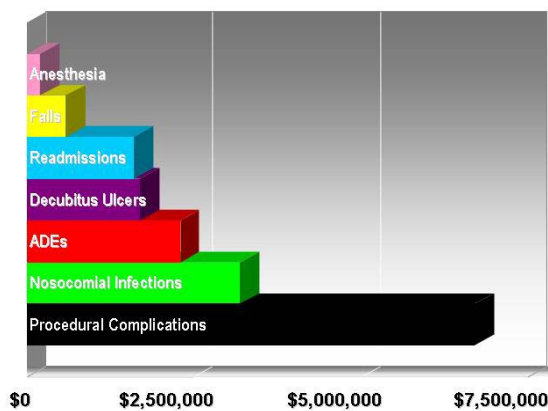
³ *David Brailer, National Health Information Technology Coordinator, at the HHS, Secretarial Summit on Health Information Technology, May 6, 2004*

- Medication errors are among the most common medical errors
- Medication errors harm at least 1.5 million people every year
- The extra medical costs of treating drug-related injuries occurring in hospitals alone conservatively amount to \$3.5 billion a year

*Preventing Medication Errors: Quality Chasm Series
Institute of Medicine
July 2006*

Bottom Line, the cost of Adverse Medical Events:

Average Adverse Medical Event annual costs: 400 bed hospital



Patient safety initiatives are putting pressures on HCOs and physician groups to “overhaul the practice of medicine” in the U.S.

The Advisory Board Company - 2001

From the Advisory Board in 2001, the sky rocketing cost of medical errors **PER** 400 bed hospital

Additionally, David Classen’s⁴ research estimates one ADE adds more than \$2,000 on average to the costs of hospitalization:

How to fix what is broken:

Insight from the Institute of Medicine: 5 key areas in which IT could contribute to an improved health care delivery system

[Crossing the Quality Chasm: A New Health System for the 21st Century](#) (2001)



Problem	Solution
Access to the medical knowledge-base	Through use of the internet, it should be possible to help both providers and consumers gain better access to clinical evidence.
Computer-aided decision support systems	Embedding knowledge in tools and training clinicians to use those tools to augment their own skills and experience can facilitate the consistent application of the expanding science base to patient care.

⁴ David Classen (Classen DC, et al. JAMA. 1997;277:301-306)

Problem	Solution
Collection and sharing of clinical information	The automation of patient-specific clinical information is essential for many types of computer-aided decision support systems. Automation of clinical data offers the potential to improve coordination of care across clinicians and settings, which is critical to the effective management of chronic conditions.
Reduction in errors	Information technology can contribute to a reduction in errors by standardizing and automating certain decisions and by aiding in the identification of possible errors, such as potential adverse drug interactions, before they occur.
Enhanced patient and clinician communication	Information technology can change the way individuals receive care and interact with their clinicians.

Formulating New Rules to Redesign and Improve Care *10 recommendations from IOM*

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| <ul style="list-style-type: none"> • Care based on continuous healing relationships • Customization based on patient needs and values • The patient as the source of control • Shared knowledge and the free flow of information | <ul style="list-style-type: none"> • Evidence-based decision making • Safety as a system property • The need for transparency • Anticipation of needs • Continuous decrease in waste • Cooperation among clinicians |
|--|---|

The Pros and Cons of Using Technology to Address Patient Safety

At the very core of patient safety is the technology that supports Computerize Physician Order Entry (CPOE) and Bar Coded Medication Administration (BCMA). The technology is not yet perfect, as cited in "Who's counting now? ROI for patient safety IT initiatives"⁵, but most agree that the benefits from a patient safety perspective FAR outweighs the limited disadvantages.

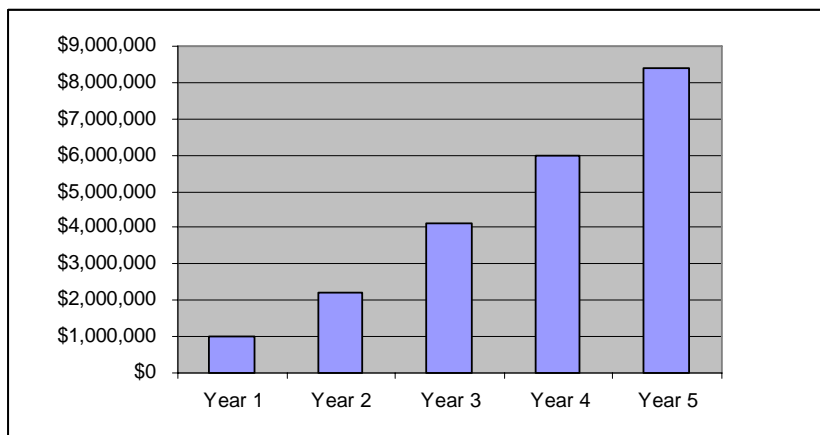
CPOE Advantages	CPOE Disadvantages
• Standardization of ordering process	• Full physician buy-in and utilization/ universal compliance and adoption commitment required
• Decrease in transcription errors	• Not as effective or useful unless it is well integrated with other core clinical information system components
• Real-time, online access to ordering information	• Issue: ease of use and intuitive flow is a requisite for physician adoption
• CPOE + clinical decision support tools + clinical repository = decrease in number of ordering errors	• Available types of end-user device(s) limited
• Ability to customize ordering process to physician needs	
• Virtual access to the electronic ordering process	
• Analysis of ordering information	
BCMA Advantages	BCMA Disadvantages
• Primary purpose: medication, dose, route, time, patient	• Current number of proven software applications are limited
• Reduce "human error"	• Integration and/or interfacing with other core medication management systems can be difficult, costly, and complex
• Immediate "electronic" documentation record - eliminate or reduce errors related to transcribing and documentation	• Relies heavily on being user-friendly and intuitive to the clinical end-user
• Caregiver with mobility	• Limited types of end-user device(s) supported
• Takes advantage of proven technology	• Ability to interface accurately with variety of applications
• Products developed to integrate across variety of technologies	• Solution does not focus specifically on medication errors (physician order)

⁵ Newell LM, Christensen D., J Healthc Inf Manag. 2003 Fall;17(4):29-35

Positive Financial Impact of Healthcare IT

Numerous articles are now being written on the positive financial impact of implementing advanced clinical systems in healthcare, both in the inpatient and outpatient settings as noted below.

Cumulative Financial Impact of EMR



The economic effect of implementing an EMR in an outpatient clinical setting⁶

5-Year Return on Investment Per Provider for Electronic Medical Records Implementation

A cost-benefit analysis of electronic medical records in primary care⁷

Next Steps

Following the guidance of the Institute of Medicine in *Crossing the Quality Chasm*, it is imperative for healthcare organizations to have a strong information infrastructure in order to coordinate care across clinicians and settings to improve patient safety and facilitate outcome measurements. .

	Initial Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Costs							
Software license	\$1,600	\$1,600	\$1,600	\$1,600	\$1,600	\$1,600	
Implementation	\$3,400						
Support	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	
Hardware	\$6,600			\$6,600			
Productivity loss		\$11,200					
Annual Costs	\$13,100	\$14,300	\$3,100	\$9,700	\$3,100	\$3,100	\$46,400
Present value of annual costs	\$13,100	\$13,619	\$2,812	\$8,379	\$2,550	\$2,429	\$42,900
Benefits							
Chart pull savings		\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	
Transcription savings		\$2,700	\$2,700	\$2,700	\$2,700	\$2,700	
Prevention of adverse drug events			\$2,200	\$2,200	\$2,200	\$2,200	
Drug savings			\$16,400	\$16,400	\$16,400	\$16,400	
Laboratory savings					\$2,400	\$2,400	
Radiology savings					\$8,300	\$8,300	
Charge capture improvement					\$7,700	\$7,700	
Billing error decrease					\$7,600	\$7,600	
Annual Benefits		\$5,700	\$24,300	\$24,300	\$50,300	\$50,300	\$154,900
Present value of annual benefits		\$5,429	\$22,041	\$20,991	\$41,382	\$39,411	\$129,300
Net benefit (cost)	\$(13,100)	\$(8,600)	\$21,200	\$14,600	\$47,200	\$47,200	\$108,500
Present value of net benefits (cost)*	\$(13,100)	\$(8,190)	\$19,229	\$12,612	\$38,832	\$36,982	\$86,400
<small>Assumes a 5% discount rate</small>							

Solutions such as Computerized Physician Order entry (CPOE) will eliminate errors from handwriting and miscommunication. Bar-coding and e-prescribing will reduce medication errors. Lastly, real time decision support will facilitate the practice of evidenced-base medicine and enable more patient-centric care. Decision support will only improve as healthcare IT matures, and we will feel it's full impact once it is derived from a clinical data repository, data warehouse, or a RHIO (Regional Health Information Organization), capturing the entire patient "life record" is in one place.

⁶ Barlow S, Johnson J, Steck J., J Healthc Inf Manag. 2004 Winter;18(1):46-51.

⁷ Wang SJ, Middleton B, Bates DW, et al, Am J Med. 2003 Apr 1;114(5):397-403.