

In Search of the ROI from CPOE

Rick Krohn, MA, MAS

Once again this year, reducing medical errors and improving patient safety has led the list of information technology priorities for CIOs, according to the 14th annual HIMSS Leadership Survey. Past reports from the Institute of Medicine (IOM) and The Leapfrog Group detailing the extent of medical errors, plus a steady stream of recent clinical studies that reinforce the persistence of medical errors throughout healthcare delivery¹, have forced the industry to focus on patient safety as the defining characteristic of near-term IT strategic planning.

But patient safety is about more than just medical error prevention. It is also about correct treatment planning, clinical excellence, correct diagnoses, correct processes and procedures, and correct patient therapies. Patient safety is a somewhat ambiguous term, but in its truest form it demands perfect information, perfect processes, and perfect clinical decisions across the spectrum of patient care. That's just unrealistic, but patient safety can be improved by removing its main obstacle — medical errors.

Advocates of e-healthcare have championed computerized physician order entry (CPOE) as the single most important technology solution to the issue of medical errors as well as a catalyst of healthcare's digital transformation. Supporters claim that CPOE reduces cost, improves patient safety, minimizes risk, and supports clinical efficiency. It's a growth industry — according to a recent study by Frost and Sullivan, the CPOE market could reach \$363.3 million by 2007, up from \$224.4 million in 2002.²

But there's another side to the CPOE story. Today only about 10 percent of U.S. hospitals have full CPOE systems, and few use them to their

full potential. And according to the 2002 Dorenfest IHDS Survey of 1,426 delivery systems, only 30 percent are in the process of evaluating or implementing CPOE systems. In the same survey, less than 25 percent respondents had most physicians entering orders electronically, 8 percent had over half of their physicians entering some orders electronically, and 21 percent of respondents had "some" physicians entering some orders electronically.³ This represents an unrealized business value of CPOE due to underutilization.

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Despite mounting industry pressure to “do something” about medical errors, CPOE has yet to gain wide acceptance, but why? CPOE systems have a baseline price tag of around \$2 million to \$5 million, which places them beyond the reach of most non-institutional providers. CPOE also demands cultural change and the adoption of standardized workflows — not an easy task across the entire organization. In a study of CEOs, CIOs, CFOs, and COOs conducted by Modern Healthcare, the major reasons CPOE is not being implemented include: pushback from physicians and clinicians (53%); focus on HIPAA

(39%); a perception of cheaper, friendlier solutions (36%); and lack of money (19%).⁴

Has CPOE Been Oversold?

There have been a number of high profile successes — and setbacks — in CPOE implementation, some within the same institution. For example, following a \$5 million initial investment in CPOE, Ohio State University Health System reported the following results: turnaround time for medications was reduced by 64 percent, turnaround times for radiology tests decreased by 43 percent, and lab test turnaround was reduced by 25 percent.⁵ But in a CPOE study of the same hospitals conducted by the Journal of American Medical Informatics Association using financial metrics, it was found that, although cost per hospital admission declined slightly among all participating hospitals (from \$5,967 to \$5,661), cost per admission at one participating hospital (The Arthur G. James Cancer Hospital) actually rose from \$6,427 to \$6,518.⁶ Such results provide a confusing picture, from a business perspective, of CPOE's value.

At Cedars-Sinai Medical Center in Los Angeles, there is no uncertainty about CPOE's impact. After a multi-year commitment to CPOE that went live in 2002, Cedars-Sinai suspended its CPOE program in early 2003 in the face of a physician revolt, sparked by a complex, error-prone rollout of the CPOE application. According to Dr. Langberg, CMO at Cedars Sinai, four complex factors led to the decision to temporarily suspend implementation of CPOE: physician resistance, insufficient workflow planning and analysis, lack of physician input, and the need for greater training and support.⁷

To be fair, there have been some

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clear victories. Brigham and Women's Hospital in Boston has reported that CPOE accounted for an 81 percent decline in medical errors over the course of the implementation. Interestingly, 64 percent of the overall decline occurred following the implementation of the first, and simplest, version of the technology, which included features such as predetermined lists of medications and doses, display of patient data, basic drug dosage, interaction, and duplication checking. The net savings of the BWH system are estimated at between \$5 million and \$10 million per year.⁸

Montefiore Medical Center in New York has also scored some CPOE success, albeit during a prolonged period of development and implementation. Since 1999, Montefiore's CPOE system has yielded a 50 percent reduction in prescribing errors, a 60 percent improvement in the time elapsed between prescription writing and prescription receipt; and improved workflows.⁹ Christus Health in Texas and Parkview Health in Indiana have reported similar successes.

How Do We Measure Success?

Determining the return on investment from clinical systems is a notoriously imprecise science; trying to devise numeric or statistical measures that demonstrate the ROI of such systems in business terms is even dicier. As a result, finding measurable evidence of CPOE effectiveness from a business perspective is elusive, due to the nature of the yardstick being used.

But if CPOE can't be substantiated by traditional business analysis, how can its value be proven? Indicators of CPOE effectiveness must not only include traditional financial benchmarks, but also such "squishy" non-financial metrics as quality and patient satisfaction. It's a problem-ridden methodology, easily challenged and derided.

Nevertheless, a fair ROI calculation of any clinical system must not only include quantifiable financial benefits, but also less tangible "soft returns" such as quality improvement, busi-

ness transformation, staff productivity and operating efficiency, patient satisfaction, and cost avoidance. Using a holistic approach to the ROI assessment of CPOE, the list of benefits includes direct and indirect, tangible and intangible measures, including:

Charge Capture. CPOE systems improve the accuracy of charge capture, which should result in streamlined billing (and payment), as well as preemption of billing disputes and government scrutiny, plus more efficient inventory and supply chain management.

Medical Errors. The marquee value proposition of CPOE is its impact on medical errors and clinical outcomes. CPOE systems have demonstrated the ability to measurably reduce the incidence of medical errors. Accurate, legible, timely orders that have been checked for possible errors yield better outcomes and improved patient satisfaction.

Decision Support. CPOE systems use rules-based logic to provide critical information to the physician at the point of care, which should result on a cumulative basis in better clinical ordering and outcomes.

Clinical Quality. Better clinical outcomes should translate into a reputation for quality — which radiates among staff, patients, and payers. This should create a competitive advantage in attracting qualified staff, creating brand preference, and improving payer-contracting relationships.

Productivity and Workflows. As a forerunner of digital transformation, CPOE serves to transform business and clinical processes, accelerate transactions, and streamline interactions. In addition to the economic benefits of improved efficiencies, CPOE can contribute to employee morale and retention.

Community Image. There is a public relations bump that comes from taking a high-profile approach to patient safety. Customer preference gravitates towards healthcare institutions that are on the cutting edge of healthcare delivery, and the resulting publicity often yields additional patient volume.

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Professional Ethics. Somewhat ethereal but still a factor in the ROI equation is the moral obligation of the U.S. healthcare industry to protect patients from avoidable errors in treatment. To the extent that CPOE contributes to this goal, it should be considered an investment whose return is measured in human rather than business terms.

Cost Avoidance. Perhaps the most compelling business case in support of CPOE is cost avoidance. According to the Institute of Medicine (IOM), the increased hospital cost of treating adverse drug events (ADEs) averaged \$4,600 per incident. In 2000, the median compensation award for medication errors was \$668,000. The risk management and legal liability issues are significant: in one study it was found that 19 percent of medications

in 36 hospitals and skilled nursing facilities were ordered erroneously. Of these errors, 7 percent were potentially harmful. This translates to 40

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potentially serious medication administration errors occurring every day in a typical 300-bed facility.¹⁰

Conclusion

From a planning perspective, the lesson of CPOE implementation — with an eye towards ROI — might be to keep it simple. The failure of Cedars-Sinai CPOE implementation can be clearly traced to a highly complex initiative that was attempted in the absence of an appreciation of the impact CPOE would have on physicians, systems, and workflows. A more reasoned approach, like the one being taken by Montefiore Medical Center, allows system integration to be conducted incrementally. In this way, the consequences of mid-course corrections tend to be less dramatic.

At the end of the day, it is unlikely that a business case can be made for the benefits of CPOE based on direct cost reduction or cost avoidance — there just isn't a clean way to measure

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a causal relationship that can be expressed in business terms. The ROI from CPOE must be viewed in a larger context, including its overall impact on outcomes, operations, productivity, and patient satisfaction,

Furthermore, CPOE must not be mistaken for the “magic bullet” of patient safety or medication error pre-

vention, whose impact is either absolute or insupportable. CPOE addresses an important aspect — but not the entire challenge — of patient safety. Finally, we’re in a climate of rising expectations regarding clinical quality and patient safety, and the value of technology solutions like CPOE may best be viewed simply as

a means of staying in the game.

About the Author

Rick Krohn, MA, MAS, is president of HealthSense, Inc., a leader in e-healthcare technology development and business transformation. He can be reached at rikrone@aol.com or 912-772-4018.

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