CPOE

Q&A

With Wendy Everett, ScD, President, New England Healthcare Institute

The Clinical and Financial Impact of CPOE

Q: What was the impetus behind the Massachusetts Technology Collaborative (MTC) and the New England Healthcare Institute's (NEHI) Clinical Baseline and Financial Impact Study on CPOE?

A: MTC and NEHI formed a partnership four years ago to look at all of the health technologies that could both improve patient care and reduce cost. We created a list of seven technologies that met both of those criteria, and of those seven, many of them were starting to be championed by other groups, but CPOE had no champion. In our minds, it was a highly valuable, but underused, technology with tremendous promise for decreasing medication errors and reducing costs in hospitals. In Massachusetts, 63 out of our 73 hospitals did not have CPOE and were not thinking about putting it in. So we formed a coalition with the Massachusetts Hospital Association, the Massachusetts Council of Community Hospitals, and a broad spectrum of health care stakeholders, including payors and quality groups, to perform some modeling and uncover the savings and error reductions we could achieve if 100% of the hospitals in Massachusetts were to adopt CPOE. We came up with significant numbers, so a year and a half ago, we created and executed the Clinical Baseline and Financial Impact Study to better understand the current baseline for medication errors and the cost associated with those errors before CPOE implementation.

Photo courtesy of Eclipsys Corporation

MTC and NEHI's study indicates that CPOE can prevent 81% of medication errors.

Q: What methods did you use to conduct the study and analyze the results?

A: We're fortunate to be in Massachusetts and to work very closely with Partners HealthCare, of which Brigham and Women's Hospital is a member. In the mid-'90s, Brigham & Women's created its own CPOE system, based on the academic research conducted by Dr. David Bates. Brigham & Women's has excelled at driving home the point that CPOE is not about clinicians entering orders on a computer; rather, CPOE is a sophisticated clinical decision support system. MTC and NEHI were able to get funding from the state legislature to contract with Dr. Bates and his team of physicians and nurses to audit 4,200 medical charts from community hospitals in Massachusetts over a 12- to 18-month period.

The study team looked at five patient safety and cost-related variables in collecting this primary research data from the hospitals: the number of adverse events associated with medication errors; the number of times an expensive drug was used when a less expensive or generic drug could have been used; the number of missed opportunities for IV to PO therapeutic substitutions; the number of redundant lab tests that were ordered; and the number of renal dosing errors. We believe our results are exceptionally conservative, because we only counted very serious medication errors. We didn't count rashes or near misses in the final analysis. So the study addresses serious preventable medication errors and redundant tests that could have been avoided if the hospital had a CPOE system.

After Dr. Bates' group completed its work, PricewaterhouseCoopers did a complete financial analysis of the costs associated with each error and, if an error had been prevented, to whom the savings would have accrued. Previous research in this area has not been able to drill down to this level of detail. Because PricewaterhouseCoopers audits almost all of the hospitals in Massachusetts, they know the books, the payor mix, and so on, and are in a unique position to calculate those allocations.

Q: What were some of the study's key findings?

A: The findings were stunning The most heart-stopping thing we learned is that, upon being admitted to a community hospital in a state that offers high-quality medical care, you have a 10% chance of being seriously harmed in a way that could have been prevented. We found that one in 10 patients admitted to a community hospital in our study period had a very serious and completely preventable medication error — a significantly higher number than we anticipated. We also found that IV to PO substitutions and the elimination of redundant lab tests don't have the same cost-savings potential outside an academic medical center as they do in an academic medical center. So we learned we don't need to put a lot of time and energy into implementing specific formularies in community hospitals, because they just don't use the number of drugs that academic medical centers do. In addition, the study found that renal dosing errors were far more serious and expensive a negative outcome than we had originally anticipated.

In our report, we chart the nature and essence of the medication errors the study uncovered, and we map the degree to which a CPOE system could have prevented a specific kind of error. Looking at the whole universe of potential medication

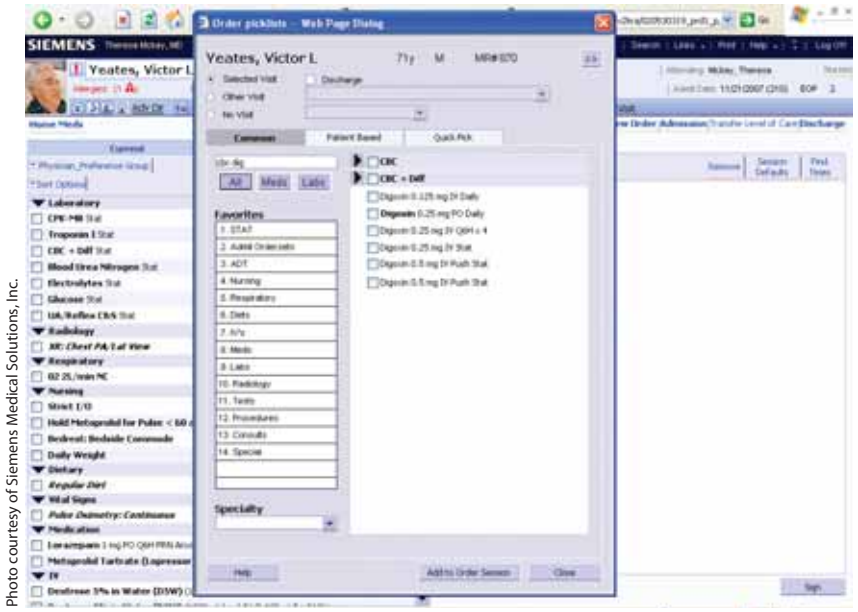

Photo courtesy of Siemens Medical Solutions, Inc.

Results of the Clinical Baseline and Financial Impact Study on CPOE indicate hospitals can expect a return on investment from a CPOE implementation within 26 months.

errors, CPOE can prevent 81% of them. So there's a lot of power in that clinical decision support application. You can't just use CPOE as a way to make orders more legible; you must use it as a robust clinical decision support system to identify drug-drug interactions and drug-allergy interactions and to connect physicians with the pharmacy and the laboratory.

Q: And what did the study reveal about CPOE's potential for cost reductions?

A: Many hospitals have not considered purchasing and implementing CPOE because of its cost, but I think this study demonstrated that hospitals can expect a return on their investment within 26 months – a quick payback. The acquisition cost for a CPOE system is about $2.1 million, and hospitals can expect annual operating expenses of about $450,000 a year. After breaking even on the initial investment, hospitals with 70% use ratings for CPOE can expect a net savings of about $2.7 million per year.

Q: How can hospitals apply the study's findings to their own operations? How can they extrapolate the data to best determine what financial and patient safety benefits CPOE can bring to their own institutions?

A: There is no reason any hospital couldn't use our methods to do their own random chart review, with Intermountain Healthcare's adverse events trigger tool. NEHI is more than happy to share its source tools with hospitals that would like to conduct their own studies, and in fact, we are in the process of developing an online toolkit to aid hospitals in calculating their baseline error rates and the potential CPOE would have to improve them.

Q: Is there information contained in the study that directors of pharmacy could use to impress the importance of CPOE adoption upon their hospitals' administrators?

A: Absolutely. Our study has a simple and direct message: CPOE saves lives and saves money – period. While that statement alone may not grab administrators' attention, you can follow it with: In a baseline study of representative hospitals, one in 10 patients had a serious, preventable medication error. That will get their attention. In our current health care climate, it's important for hospitals to be able to demonstrate that they are doing everything they can to prevent potential errors. Now that Medicare says it will not pay for what it calls negligent events, hospital CEOs are looking even harder for ways to prevent medication errors, particularly for technologies that can save their institutions $2 to $3 million a year. Now that this study has been published, there is a real accountability issue. The data is the first of its kind to look inside a hospital to show people what's going on and how to prevent it.

Secondly, since the study results have gone public, Massachusetts payors, led by Blue Cross/Blue Shield of Massachusetts, have made a policy decision to prevent hospitals that have not fully implemented CPOE by 2012 from participating in their 10% pay for performance incentive program. That's a significant carrot to dangle in front of hospitals as they begin to implement clinical decision support systems over the next four years.

CPOE technology has been in existence for more than 10 years, and we need to move hospitals forward in adopting this technology. It is a powerful innovation that can be used to the benefit of our patients and our bottom lines. ■

Wendy Everett, ScD, currently serves as the president of New England Healthcare Institute (NEHI), a post she has held since July 2002. With over 30 years of experience in the health care field, Everett has held executive positions at the University of California, San Francisco Medical Center (UCSF), and at Brigham and Women's Hospital in Boston. Everett holds two BS degrees, as well as master's and doctoral degrees in health policy and management from Harvard University.

To download an executive summary of NEHI's study, visit:
http://www.nehi.net/uploads/executive_summary/cpoe_executive_summary.pdf

To download the full report, visit:
http://www.nehi.net/uploads/full_report/cpoe20808_final.pdf

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