

Results of the 2014 Leapfrog Hospital Survey: Computerized Physician Order Entry

Developed for The Leapfrog Group by Castlight Health®



Table of contents

Introduction	3
Computerized Physician Order Entry (CPOE) and Medication Errors	4
Continued progress but challenges remain	5
Computer Physician Order Entry System Adoption and Use	5
Good news: an all-time record number of hospitals are adopting CPOE systems that work.....	7
Testing the safety and effectiveness of CPOE systems	8
Good news, bad news: challenges still remain	9
Conclusion and calls-to-action.....	10

2014 Leapfrog Hospital Survey results

Every year, The Leapfrog Group and its membership (employers and other organizations that purchase health insurance coverage for employees and their families, as well as business coalitions on health) ask every adult general acute care and freestanding pediatric hospital in the U.S. to voluntarily complete the Leapfrog Hospital Survey. Leapfrog uses the survey data to publicly report on issues that matter to health care purchasers and consumers, including high-risk surgeries, maternity care, hospital-acquired infections, and more. Measures included on the Leapfrog Hospital Survey are endorsed by the National Quality Forum and/or aligned with those of other significant data-collection entities, including the Center for Medicare and Medicaid Services (CMS) and the Joint Commission. Leapfrog partners with the Armstrong Institute for Patient Safety and Quality at Johns Hopkins Medicine to review survey measures and standards, and updates them annually to reflect the latest science. Additionally, panels of experts volunteer to meet regularly to review the survey measures and recommend performance standards for each subject area covered on the Leapfrog Hospital Survey.

This is the third in a series of reports Castlight Health is preparing on the results of the 2014 Leapfrog Hospital Survey. To read the first two reports on Maternity Care and High-Risk Procedures, [click here](#).

Computerized Physician Order Entry (CPOE) and Medication Errors

Medication errors are the most common mistakes made in hospitals, with one occurring on average every day per inpatient stay.¹ Studies such as one led by Dr. David Bates, MD, Chief of General Medicine at Boston's Brigham and Women's Hospital,² suggest that a well-designed computerized physician order entry (CPOE) system could substantially reduce these errors.



¹ Institute of Medicine. Preventing medication errors. Washington, DC: National Academy Press; 2007

² Bates DW, Leape LL, Cullen DJ, Laird N, et al. Effect of computerized physician order entry and a team intervention on prevention of serious medication errors. JAMA. 1998;280:1311-6.

Continued progress but challenges remain

The Leapfrog Group's survey shows continued progress in the adoption of CPOE systems but there is still work to do. Key findings include:

- **Record number of hospitals adopting CPOE systems:** In 2014, an all-time record of 1,339 hospitals reported using a CPOE system in at least one inpatient unit, compared with 384 in 2010.
- **Growing number of hospitals meeting Leapfrog's standard:** 59% of those hospitals reported using CPOE to enter at least 75% of their inpatient medication orders and passed the Leapfrog CPOE evaluation test for effective alerting.
- **Challenges in safety and effective of CPOE use remain:** Performance has held relatively steady, with the proportion of all potentially harmful orders that did not receive an appropriate warning remaining at 36%, and the number of potentially fatal orders that weren't flagged falling from 15.2% in 2013 to 13.9% in 2014.

Computer Physician Order Entry System Adoption and Use

Each year in U.S. hospitals, serious preventable medication errors occur in 3.8 million inpatient admissions³ and cost \$16.4 billion. Errors such as incorrect dosing, mislabeled drug allergies, harmful drug interactions or dispensing problems are frequent, and the harm they cause can be significant, even resulting in death. They are also extremely expensive, costing approximately \$4,300 per error.

³ Massachusetts Technology Collaborative and NEHI, "Saving lives, saving money: The imperative for CPOE in Massachusetts", 2008



Figure 1: Inpatient preventable adverse drug events

CPOE systems are used by clinicians in hospitals to directly enter medication orders into a computer system, with the orders electronically transmitted directly to the pharmacy. Because approximately 90% of medication errors occur during manual ordering and transcribing (writing and interpreting the prescription), the use of CPOE systems could help eliminate these types of errors. CPOE integrates the medication order with patient information, such as allergies, lab results and other prescription data. The order is then automatically checked for potential errors or problems such as drug and allergy interactions or drug-to-drug interactions. CPOE systems also suggest default values for drug doses, as well as routes of and frequency of administration. Effective use of CPOE systems can help reduce the risk of a wrong drug or dose being delivered to a patient, and avert problems caused by poor handwriting, similar drug names, drug interactions and specification errors. Any of these types of mistakes can lead to serious consequences for patients, from not receiving the benefit of the intended medication to death from a severe allergic reaction.

The Leapfrog Group, a national employer-driven nonprofit watchdog organization, has annually tracked how hospitals adopt and effectively use CPOE systems in order to assess a hospital's ability to prevent medication errors. Leapfrog makes this information public so health care consumers and purchasers can use it to compare hospitals and make smarter choices for care.

Leapfrog's standard for CPOE:

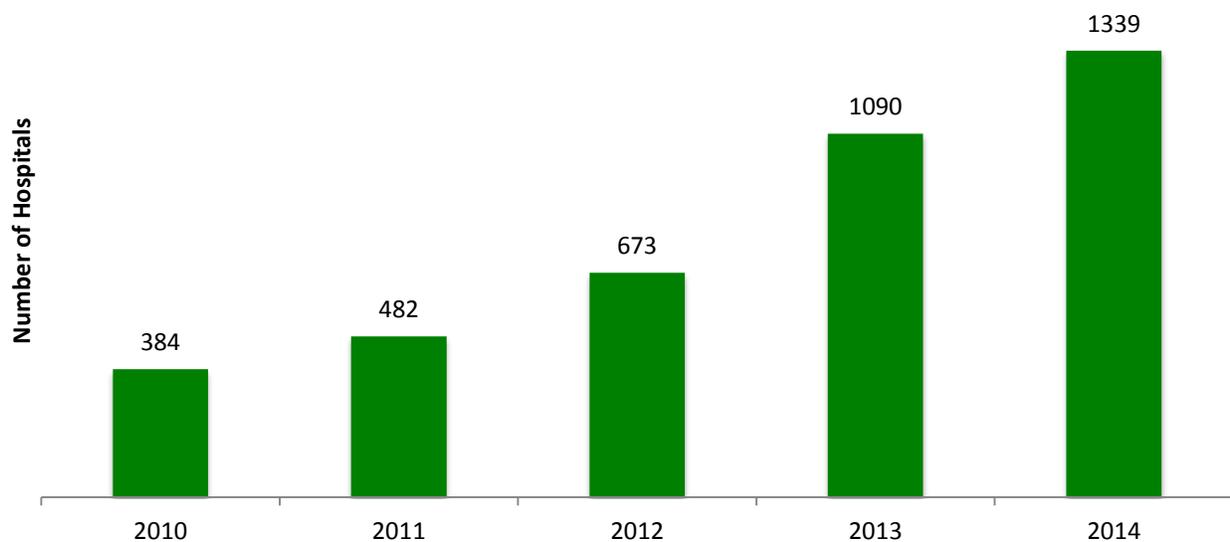
The Leapfrog standard is aimed at ensuring patients are being prescribed medications through a computerized order entry system that alerts prescribers to drug-drug interactions, drug-allergy interactions and other potential prescribing errors, and requires that:

- At least 75% of medication orders across all inpatient units are ordered through a CPOE system
- The hospital has tested the system to ensure that physicians are alerted to common, serious medication errors and demonstrated that their inpatient CPOE system can alert physicians to at least 50% of common, serious prescribing errors

Good news: an all-time record number of hospitals are adopting CPOE systems that work

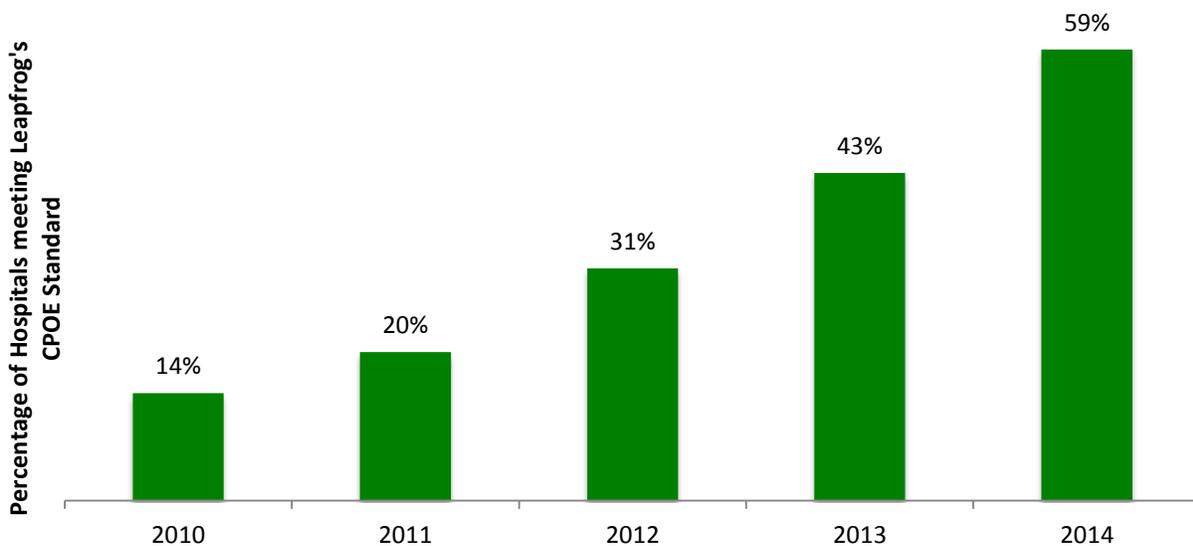
In 2014, an all-time record of 1,339 hospitals reported using a CPOE system in at least one inpatient unit, compared with 384 in 2010.

Hospitals reporting CPOE system utilization in at least one inpatient unit



Moreover, in 2014, 59% of those hospitals reported using CPOE to enter at least 75% of their inpatient medication orders and passed the Leapfrog CPOE evaluation test for effective alerting, **thereby meeting the Leapfrog standard for CPOE use**. This is a dramatic increase since 2010, when only 14% met the standard. This may largely be due to the influence of federal funding for hospitals’ “meaningful use” of health information technology—authorized under the American Recovery and Reinvestment Act. Nonetheless, Leapfrog’s standard is far more rigorous than the federal requirements, so it’s very promising to see the growing number of hospitals reaching this milestone.

Percentage of hospitals fully meeting Leapfrog's CPOE standard



Testing the safety and effectiveness of CPOE systems

Not all CPOE systems are alike, and none are simply “plug-and-play” solutions that work effectively year after year. That’s why the Leapfrog standard also requires that hospitals continually test the safety of their CPOE systems. Hospitals must take the test every year using Leapfrog’s CPOE Evaluation Tool because both medications and the hospitals’ systems change on an ongoing basis. The tests provide valuable assurance to hospitals that their systems are up-to-date.

The Leapfrog Group’s CPOE Evaluation Tool, developed by Dr. David Bates, Dr. David Classen, Jane Metzger and colleagues—with funding from the Agency for Healthcare Research and Quality (AHRQ) as well as others—is the only tool in the U.S. that helps hospitals test whether or not their CPOE system is alerting physicians to

common, serious prescribing errors such as drug-to-drug interactions and drug-allergy interactions. The tool also tests how effectively a hospital's CPOE system is alerting physicians to potential drug overdoses, especially in the elderly or in patients with kidney dysfunction, as well as to drugs that are contraindicated in certain diagnoses.

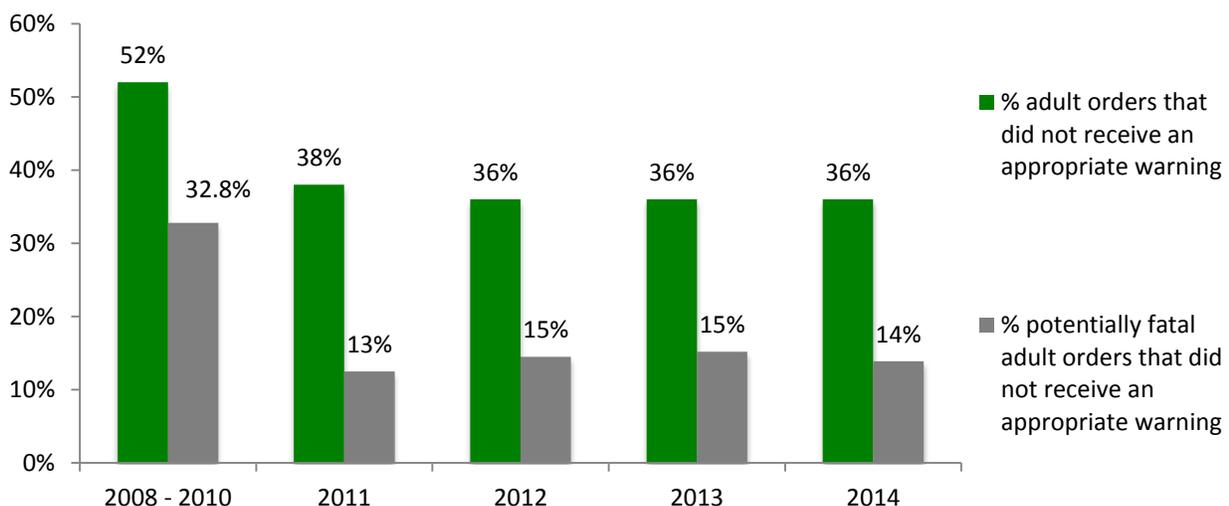
The tool requires hospitals to download a set of test patients and test orders, and then simulate how their CPOE system responds when they try to give the test orders to these test patients. Leapfrog scores each hospital on how well its system intercepts orders that would result in patient harm or death.

Good news, bad news: challenges still remain

With the Leapfrog CPOE Evaluation Tool, hospitals have an effective resource for evaluating and improving their use of CPOE systems. In 2014, hospitals performed 1,249 tests of their CPOE systems using Leapfrog's tool, 30% more than in 2013, when 931 tests were performed. While this increase in the number of tests being run is welcome, performance has held relatively steady, with the proportion of all potentially harmful orders that did not receive an appropriate warning remaining at 36%, and the number of potentially fatal orders that weren't flagged falling from 15.2% in 2013 to 13.9% in 2014.

Based on the results of the CPOE Evaluation Tool, Leapfrog finds that hospitals are improving their ability to detect potential medication errors through the use of decision-support software. However, it's troubling that not all CPOE systems gave the appropriate warnings to prevent patient harm.. The failure rate remains far too high and points to the critical need for hospitals to make additional improvements to their medication-ordering processes.

CPOE test orders that did not receive an appropriate warning



Conclusion and call to action

All hospitalizations carry some degree of risk, and medication errors are the number-one cause of harm to patients in hospitals.⁴ However, it's evident that some hospitals in the U.S. are capable of providing safer, higher-quality care, and patients deserve to know how well hospitals in their community are able to protect them from harm.

Many hospitals have already implemented CPOE systems to ensure their patients experience a safer hospitalization. Below are other steps that hospitals and other stakeholders can take to deliver the best care.

- **Hospitals** that haven't implemented a CPOE system or are not using CPOE systems in all of their units are encouraged to continue working toward a safer environment for patients—learning from other hospitals that have achieved high standards of care. Every hospital that employs a CPOE system should incorporate the Leapfrog simulation tool into its ongoing quality assurance and improvement processes and then should address the results by making needed improvements. For safe patient care, hospitals must test and monitor their CPOE systems on an ongoing basis to achieve true meaningful use.
- **Employers** should urge hospitals to complete the Leapfrog Hospital Survey and should encourage their employees to choose hospitals that have tested CPOE systems in place to support safer care.
- **Patients and families** that need hospital care are encouraged to consult the Leapfrog Hospital Survey results before choosing a hospital and to understand as much as they can about their medications, any contraindications, and possible side effects.

Choosing a hospital for care is one of the most important decisions consumers can make. By taking strong action, hospitals, employers and consumers can each play a part in ensuring patients have the greatest possible chance for a positive outcome.

To learn more about Leapfrog's CPOE program, go to its Computerized Physician Order Entry [fact sheet](#).



⁴ Wachter, Robert, "Understanding Patient Safety, Second Edition, May 2012

About The Leapfrog Group:

National nonprofit watchdog The Leapfrog Group was founded in 2000 by employers and other purchasers of health benefits to collect data from U.S. hospitals and publicly report their performance by facility. Leapfrog has been the nation's premier advocate of transparency to galvanize giant leaps forward in quality and safety of care. Leapfrog's data by hospital from the [Leapfrog Hospital Survey](#) and [Hospital Safety Score](#) allow purchasers of healthcare to structure contracts and purchasing toward the highest performing hospitals, while providing consumers with potentially lifesaving information on hospital quality. The biannual Hospital Safety Score, which assigns letter grades to hospitals based on how safe they are for patients, empowers consumers to search for a local 'A' hospital for their life-long healthcare needs.

About Castlight Health:

Castlight Health, Inc. (NYSE:CSLT) is the leader in Enterprise Healthcare Management. We believe great healthcare builds great business and U.S. enterprises can gain control over the \$620 billion spent annually on healthcare, transforming a crippling cost into a strategic business advantage. Recognized as [a top 2014 software platform](#) by the HR Technology Conference & Exposition, Castlight's Enterprise Healthcare Cloud enables employers to understand and manage all their healthcare investments while helping employees make the best possible healthcare decisions. Castlight is a great place to work, honored with a [Glassdoor Employees' Choice award](#) and recognized by Rock Health for Diversity in Leadership. For more information visit www.castlighthealth.com. Follow us on [Twitter](#) and [LinkedIn](#) and Like us on [Facebook](#).

