Overview of the Leapfrog CPOE Evaluation Tool

An educational update to the HIMSS EIS Steering Committee
August 13, 2009
Overview

• What is the CPOE Evaluation Tool?
• Development of the Tool
• Why is Tool like this needed?
• How does the CPOE Evaluation Tool work?
• Accessing the Tool and Preparations
• Screen Shots of CPOE Evaluation Tool
• Support
• Overall CPOE Leap Scoring
• Clarifications
• Q+A
What is the CPOE Evaluation Tool?

• The Computerized Physician Order Entry (CPOE) Evaluation Tool is embedded in the Leapfrog Hospital Survey

• A remote simulation test of a hospital's CPOE system

• Provides hospitals feedback on how well their CPOE system alerts users to common, serious prescribing errors
**Development of the Tool**

- Tool developed by First Consulting Group with assistance from patient safety experts and the Institute for Safe Medication Practices

- Developed and then tested in more than 12 hospitals in 2001-2007

- Funded by California HealthCare Foundation (CHCF), Robert Wood Johnson Foundation (RWJF), and Agency for Healthcare Research and Quality (AHRQ)

- Pilot tested with seven hospitals in Spring 2008 (5 adult/general hospitals; 2 children’s hospitals)

- Tested the tool with systems from most/all of the common CPOE vendors
Why is a Tool Like This Needed?

- More than one million serious medication errors occur in US hospitals; many are life threatening.

- CPOE systems with proactive use of decision support tools are recognized as one important investment to help avoid preventable medication-related adverse events.

- Implementing decision support is a multi-year project in any hospital using CPOE.

- Until now, hospitals have not had the ability to test how well their CPOE systems are catching common, serious prescribing errors.
How Does the Tool Work?

• Hospitals download a series of test patients and test orders
  – Sample test
  – Actual evaluation

• The test orders are entered into the hospital’s CPOE system (usually test system) for the test patients

• Hospitals record system responses on an answer sheet and report those responses on the tool website

• The evaluation tool compares responses and calculates how many times the implemented decision support helped to avert a potential adverse event
What types of test orders?

<table>
<thead>
<tr>
<th>Order Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapeutic duplication</td>
<td>Medication with therapeutic overlap with another new or active order</td>
</tr>
<tr>
<td>Single and cumulative dose limits</td>
<td>Medication with a specified dose that exceeds recommended dose ranges or cumulative dose</td>
</tr>
<tr>
<td>Allergies</td>
<td>Medication (or medication class) for which patient allergy has been documented</td>
</tr>
<tr>
<td>Contraindicated route of administration</td>
<td>Order specifying an inappropriate route of administration</td>
</tr>
<tr>
<td>Drug-drug interaction</td>
<td>Medication that results in known, dangerous interaction when used in combination with a new or existing ordered medication</td>
</tr>
<tr>
<td>Contraindication based on patient diagnosis</td>
<td>Medication either contraindicated based on patient diagnosis or diagnosis affects appropriate dosing</td>
</tr>
<tr>
<td>Contraindication based on age and weight</td>
<td>Medication either contraindicated for this patient based on age or weight or for which age and weight must be considered in appropriate dosing</td>
</tr>
<tr>
<td>Contraindication based on laboratory studies</td>
<td>Medication either contraindicated for this patient based on laboratory studies or for which relevant laboratory results must be considered in appropriate dosing</td>
</tr>
<tr>
<td>Corollary</td>
<td>Intervention that requires an associated or secondary order to meet the standard of care (e.g., monitoring)</td>
</tr>
<tr>
<td>Cost of care</td>
<td>Test that duplicates a service within a timeframe in which there is typically minimal benefit from repeating the test</td>
</tr>
</tbody>
</table>
How Does the Tool Work? [cont’d]

• Timed test
  – Four (4) hours to download patients and enter patients and their characteristics into hospital CPOE system
  – Two (2) hours to enter medication orders, record system responses, and enter responses into the scoring sheet on the tool website
  – Hospital generally find these time limits to be generous

• Hospitals receive back a report with:
  – Score for each test category
  – Overall score on test
  – List of missed orders that could cause severe patient harm

• Deception analysis & nuisance orders have been incorporated into test
Which Hospitals Can Access the Tool?

• Hospitals must first indicate in the Leapfrog Hospital Survey they have a CPOE system in place in at least one inpatient unit of the hospital (CPOE Q#1 = YES)

• Tool is not accessible or usable to hospitals that have not implemented CPOE in at least one inpatient unit – or to US hospitals who do not participate in the Leapfrog Hospital Survey
Accessing the Tool

• Hospitals access the tool from the Leapfrog Hospital Survey homepage
  https://leapfrog.medstat.com

• On the left-hand side of survey homepage ("Go to CPOE Evaluation Tool")

• Hospitals use same 16-digit security code for CPOE Tool as survey
Before Starting

• Very detailed instructions have been provided - we strongly urge hospitals to read them completely through and very carefully before beginning

• Hospitals need a small team of individuals to conduct the test (suggested areas of expertise listed in instructions)

• Sample test is provided – we urge hospitals to take advantage of this test; the sample test has smaller number of patients and pharmacy orders, but same 4 hr/2 hr time limits and will help a hospital understand who needs to do what

• For credit, adult/general hospitals need to complete an adult test; children’s hospitals complete a Peds test

• Timed test!!! Advanced planning is crucial!
Leapfrog CPOE Evaluation Tool

Login using your security code

To log into the system, please provide your hospital's 16-digit security code.

Enter your security code here:  

The 16 digit security code is the same as that used to access the Leapfrog hospital Survey. Get it from your hospital's survey contact/coordinator or see the link at the home page of the online survey: Need a security code to login?

Login

WARNING: Once logged in, don't close the browser until you have Logged Out, otherwise you will be locked out for 20 minutes.
### Leapfrog CPOE Evaluation Tool

#### Organization and Contact Information

Update as needed then Save & Continue

<table>
<thead>
<tr>
<th>MPN</th>
<th>00-040M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Name</td>
<td>Test Hospital #40</td>
</tr>
<tr>
<td>Street Address</td>
<td>125 Anystreet</td>
</tr>
<tr>
<td>City</td>
<td>Washington</td>
</tr>
<tr>
<td>State</td>
<td>DC</td>
</tr>
</tbody>
</table>

This information is based on your hospital’s current Organization Information in the Leapfrog Hospital Survey. If it is incorrect, please Logout of this Evaluation Tool and change it in the Survey.

* Required fields

#### Additional Facility Information

1. Hospital type
   - Both
   - Adult/general
   - Pediatric

2. Academic teaching facility?
   - Yes
   - No

#### CPOE Application Information
Leapfrog CPOE Evaluation Tool

Previous Tests

<table>
<thead>
<tr>
<th>Test Date-Time</th>
<th>Test Type</th>
<th>Test Status</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8/2008 10:25:23 AM</td>
<td>Sample Test</td>
<td>Completed</td>
<td>View Results</td>
</tr>
</tbody>
</table>

Click on View Results for any completed test to see a scoring summary.

Select a Test

To begin a CPOE Test, you first must obtain the patient descriptions (criteria) that must be programmed into your ADT, Laboratory, and CPOE applications as appropriate. Once you download the patient descriptions, you will have up to **four hours** to print them, program the patient descriptions into the appropriate applications in your CPOE test or mirrored production environment, return to this site and download the order set for testing.

Please select CPOE Evaluation Type:

This selection determines the type of CPOE Test that you will receive. You can select and conduct only one type of test at a time.

---

Logout without Testing  
Download Patients

---
Leapfrog CPOE Evaluation Tool

You are about to start a CPOE test: Pediatric Inpatient

You will have four hours to complete this phase of the test. During that time you must:
- print a list of patients and their characteristics (Step 1),
- load the patient information into your hospital system(s) (Step 2),
- login again to this site, and
- print a set of orders (Step 3) to continue to the next phase of this test.

If you do not complete this phase of the test, the test will be marked as incomplete for your hospital and you will not be able to take this test again for six months for this hospital.

Are you sure you want to start this test?

[Yes, Continue the Test] [No, Logout & Return Later]
Leapfrog CPOE Evaluation Tool

Patient Descriptions

Do not logout, close this window or browser, or navigate elsewhere, until you have printed these patients and confirmed that all patients and all eight columns have successfully printed.

Do so within 20 minutes to avoid timing out, after which these patients can no longer be retrieved.

The four-hour clock is now running to complete Steps 1-3.

<table>
<thead>
<tr>
<th>Patient ID</th>
<th>Age</th>
<th>Sex</th>
<th>Weight</th>
<th>Severe Allergies</th>
<th>Diagnosis/Problems</th>
<th>Lab Values</th>
<th>Specifics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>52 years old</td>
<td>Male</td>
<td>73 Kg</td>
<td>Penicillin</td>
<td>None</td>
<td>Potassium = 4.0 mEq/L</td>
<td>No medications on medication list</td>
</tr>
<tr>
<td>2</td>
<td>43 years old</td>
<td>Male</td>
<td>75 Kg</td>
<td>No Known Drug Allergies</td>
<td>None</td>
<td>None</td>
<td>Completed an iodinated contrast head CT three hours ago. No medications</td>
</tr>
</tbody>
</table>
Medication Orders and Observation Sheet

Medication Orders

- Do not logout, close this window or browser, or navigate elsewhere, until you have printed these orders and confirmed that all orders and all four columns have successfully printed.
- Do so within 20 minutes to avoid timing out, after which these patients can no longer be retrieved.
- The two-hour clock is now running to complete Steps 3-5.

Please print the orders shown below and enter the orders into your CPOE application for the appropriate patients. Record the results of each order including the alert message then return to this site to submit the results.

**Medication Orders for Sample Test**

Do not logout, close this window or browser, or navigate elsewhere, until you have confirmed that all orders and all columns have successfully printed.

If problems printing:
- set your browser to print in Landscape page-orientation
  - (on Internet Explorer browser menu, click File (or use Alt-F) -> PageSetup... -> set Orientation=Landscape), then
- use your browser print button.

<table>
<thead>
<tr>
<th>Patient ID</th>
<th>Order ID</th>
<th>Order(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Ampicillin 500 mg IV every 6 hours</td>
</tr>
</tbody>
</table>

- Signed order and did not receive advice or information
- Could not order . .  with this dose  with this route  not in formulary
- Received advice or information on: (type(s) of advice/info received -- check all that apply*)
  - Therapeutic dup
  - Dose limits
  - Dose adjustment
  - Age contraindication
  - Drug route
  - Drug-drug interaction
  - Drug allergy
  - Drug-food interaction
  - Diagnosis contraindication
  - Co-orders
  - Dup orders
  - Other: ____________________________
Complete your answers within 20 minutes to avoid timing out, otherwise your entries may be lost.

The two-hour clock is still running to complete this Step 5.

You are now ready to submit your answers based on your CPOE systems responses to the the medication orders in this test. Please take your time and carefully enter your responses. Only one result per order can be entered. Once you have completed entering all results, click on the bottom of this page to record your results.

<table>
<thead>
<tr>
<th>Order ID</th>
<th>Order(s)</th>
<th>Results from Answer Sheet (check one)</th>
</tr>
</thead>
</table>
| 1        | Ampicillin 500 mg IV every 6 hours | ○ Received advice or information on allergies to medication  
          |                                     | ○ Placed order and did not receive advice or information on allergies to medication  
          |                                     | ○ Medication Not on Formulary |
| 2        | 1) Biaxin 500 mg (Clarithromycin) po twice daily, 2) Coumadin 5 mg (Warfarin) po daily | ○ Received advice or information on drug-drug interactions  
          |                                     | ○ Placed order and did not receive advice or information on drug-drug interactions  
          |                                     | ○ Medication Not on Formulary |
Leapfrog CPOE Evaluation Tool

Statement of Accuracy

These test answers are based on results from our hospital's CPOE system using test scenarios -- patient data and medication orders -- provided by this CPOE Evaluation Tool. We have made a good faith effort to exercise that test consistent with the instructions provided in the Tool and to report accurately the results presented by our hospital's CPOE system upon order-entry.

I am authorized to submit these test results on behalf of our hospital.

We understand that The Leapfrog Group and its participants will make this information or analyses of it public*, and that they reserve the right to omit or disclaim information that is not current. We further understand and agree that the test is provided by The Leapfrog Group and its agent(s) on an as-is basis without any warranties or representations that the test thoroughly tests, audits, or validates a hospital's CPOE or other clinical decision support system(s).

* During the 2008 cycle of the Leapfrog Hospital Survey, The Leapfrog Group does not plan to release test results publicly, but will release information based solely on the fact that your hospital has taken this test.

Affirmed and submitted by ______________, the hospital’s ______________

(Name) (Title)

on May 8, 2008

Affirm & Submit
# Leapfrog CPOE Evaluation Tool

## Test Results

<table>
<thead>
<tr>
<th>Medication Checking: Category</th>
<th>Score (in percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapeutic Duplication</td>
<td>60.0%</td>
</tr>
<tr>
<td>Single and Cumulative Dose Limits</td>
<td>85.7%</td>
</tr>
<tr>
<td>Allergies and Cross Allergies</td>
<td>100.0%</td>
</tr>
<tr>
<td>Contraindicated Route of Administration</td>
<td>75.0%</td>
</tr>
<tr>
<td>Drug:Drug interactions</td>
<td>83.3%</td>
</tr>
<tr>
<td>Drug:Diagnosis interactions</td>
<td>75.0%</td>
</tr>
<tr>
<td>Contraindication / Dose Limits Based on Age and Weight</td>
<td>100.0%</td>
</tr>
<tr>
<td>Contraindication / Dose Limits Based on Laboratory Studies</td>
<td>100.0%</td>
</tr>
<tr>
<td>Corollary Orders</td>
<td>100.0%</td>
</tr>
<tr>
<td>Cost Of Care</td>
<td>100.0%</td>
</tr>
<tr>
<td>Deception Analysis</td>
<td>25.0%</td>
</tr>
<tr>
<td>Nuisance Orders</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Medication Checking OVERALL score does not include Nuisance Orders or Deception Analysis categories.
Overall Score

Your OVERALL Score for Medication Checking

Fully implemented

The OVERALL Score is based on a composite of Scores for each of the Medication Checking categories above. See Understanding Test Results for definitions of these categories and how the overall score was derived.
Help Desk Support

• If hospital needs assistance during test, click on “Leapfrog Helpdesk” on left-hand side of CPOE tool homepage:

https://leapfrog.medstat.com/cpoe/
Includes an ability to indicate “test underway/immediate help needed”

• Help desk response time may be hours, not minutes. So advanced planning and taking sample test is critical.
CPOE Tool Website Resources

- Instructions
- Scoring Description
- CPOE Evaluation Tool FAQs
# CPOE Leap Scoring for 2009

<table>
<thead>
<tr>
<th>Implementation Status</th>
<th>Fully Implemented</th>
<th>Good Progress in Implementing</th>
<th>Good Early Stage Effort</th>
<th>Completed The Evaluation</th>
<th>Incomplete Evaluation (Failed deception analysis) -or- Did not complete an evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fully Implemented</strong></td>
<td>Fully Meets Standards (4 bars)</td>
<td>Fully Meets Standards (4 bars)</td>
<td>Substantial Progress (3 bars)</td>
<td>Substantial Progress (3 bars)</td>
<td>Willing to Report (1 bar)</td>
</tr>
<tr>
<td><strong>Good Progress in Implementing</strong></td>
<td>Substantial Progress (3 bars)</td>
<td>Substantial Progress (3 bars)</td>
<td>Substantial Progress (3 bars)</td>
<td>Some Progress (2 bars)</td>
<td>Willing to Report (1 bar)</td>
</tr>
<tr>
<td><strong>Good Early Stage Effort</strong></td>
<td>Substantial Progress (3 bars)</td>
<td>Some Progress (2 bars)</td>
<td>Some Progress (2 bars)</td>
<td>Some Progress (2 bars)</td>
<td>Willing to Report (1 bar)</td>
</tr>
<tr>
<td><strong>Completed The Evaluation</strong></td>
<td>Some Progress (2 bars)</td>
<td>Some Progress (2 bars)</td>
<td>Willing to Report (1 bar)</td>
<td>Willing to Report (1 bar)</td>
<td>Willing to Report (1 bar)</td>
</tr>
<tr>
<td><strong>Incomplete Evaluation (Failed deception analysis) -or- Did not complete an evaluation</strong></td>
<td>Can not take CPOE Evaluation Tool; Will receive score of “Willing to Report” (1 bar)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Declined to respond:**
The hospital did not respond to this section of the survey, or the hospital was asked to complete the survey but has not submitted one.

**Response not required:**
Hospital not targeted for reporting on this Leap.
Clarifications

• Hospitals must wait six months to repeat the test

• Hospitals can use a mirror or “test” CPOE system, but the system has to match exactly

• Hospitals in multi-hospital health systems all need to take test, even if all have a “common” CPOE system
Feedback on CPOE Evaluation Tool

“No question—this is a valuable experience—it is very important work and it should be applauded.”

David Stockwell, Medical Director of Patient Safety; Children’s National Medical Center
Thank you.

Any questions?