



Assessing Medical Technology- Are We Being Told the Truth. The Case of CPOE



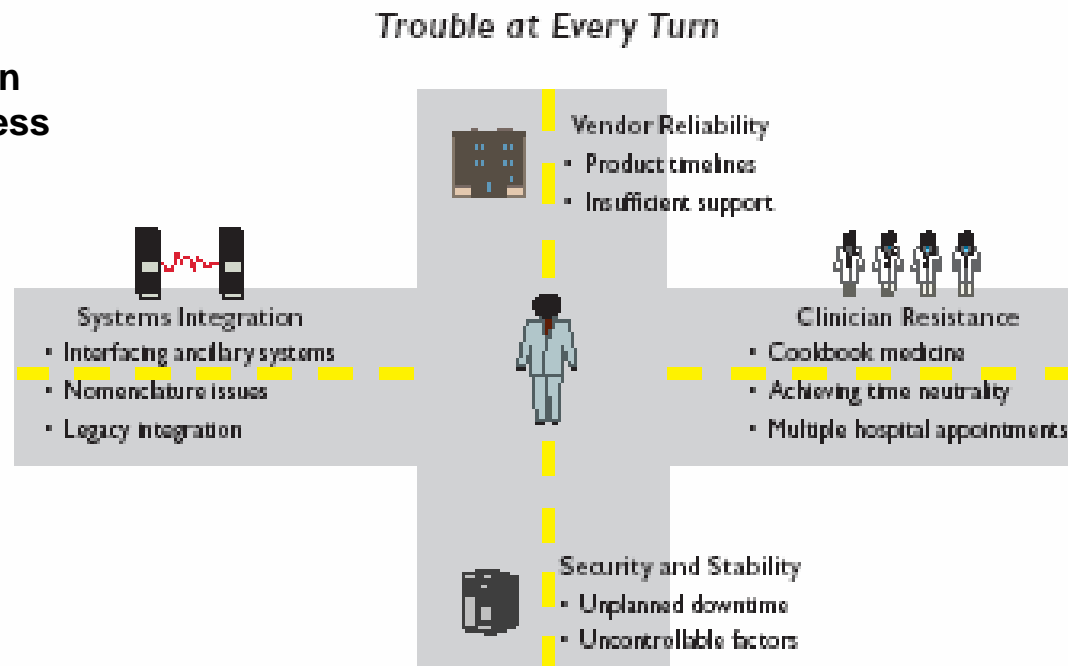
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FCG and University of Utah**



August 21, 2007

CPOE Adoption Growing Despite Barriers

- 15% US Hospitals
- 10% Ambulatory Clinics
- Increasing at 50% year on year as many are in process of implementing CPOE



CAUTION FROM CPOE VETERANS

"CPOE is the most difficult technology implementation I can think of in the acute care setting."

John Glaser
VP and CIO, Partners Healthcare

"An incredible number of stars need to align for you to be able to pull this [CPOE] off. And even if the stars are aligned, it's almost impossible to describe the amount of work that's required to succeed to those institutions that haven't started it yet."

Jim Turnbull
VP and CIO, Children's Hospital of Denver; Chair, CHIME Board of Trustees

True North 2003

Can CPOE Cause Errors?

JOBNAME: JAMA.XML PAGE: 1 SESS: 22 OUTPUT: Mon Feb 21 08:12:20 2005
/jama/05jobs/weekly/09mar05/joc42133 DATE: 02/18/05 TIME: 18:20 USER: naitan

DRAFT

ORIGINAL CONTRIBUTION

Role of Computerized Physician Order Entry Systems in Facilitating Medication Errors

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ADVERSE DRUG EVENTS (ADEs) are estimated to injure or kill more than 770 000 people in hospitals annually.¹ Prescribing errors are the most frequent source.^{2,3} Computerized physician order entry (CPOE) systems are widely

Context: Hospital computerized physician order entry (CPOE) systems are widely regarded as the technical solution to medication ordering errors, the largest identified source of preventable hospital medical error. Published studies report that CPOE reduces medication errors up to 81%. Few researchers, however, have focused on the existence or types of medication errors facilitated by CPOE.

Objective: To identify and quantify the role of CPOE in facilitating prescription error risks.

Design, Setting, and Participants: We performed a qualitative and quantitative study of house staff interaction with a CPOE system at a tertiary-care teaching hospital (2002-2004). We surveyed house staff (N=261; 88% of CPOE users); conducted 5 focus groups and 32 intensive one-on-one interviews with house staff, information technology leaders, pharmacy leaders, attending physicians, and nurses; shadowed house staff and nurses; and observed them using CPOE. Participants included house staff, nurses, and hospital leaders.

Main Outcome Measure: Examples of medication errors caused or exacerbated by the CPOE system.

PEDIATRICS[®]

Unexpected Increased Mortality After Implementation of a Commercially Sold Computerized Physician Order Entry System

Scott Watson, Trung C. Nguyen, Hülya Bayir and
Richard A. Orr

Yong Y. Han, Joseph A. Carcillo, Shekhar T.
Venkataraman, Robert S.B. Clark, Richard A Orr.

Pediatrics 2005;116;1506-1512

- 1. Industry and government should collaborate to establish standards, affecting drug-related health information technologies, specifically:**
 - AHRQ should take the lead in organizing safety alert mechanics by severity, frequency, and clinical importance to improve clinical value and acceptance.
 - AHRQ should take the lead in developing intelligent prompting mechanisms specific to a patient's unique characteristics and needs; provider prescribing ordering, and error patterns; and evidence-based best practice guidelines.
 - AHRQ should support additional research to determine specifications for alert mechanisms and intelligent prompting, and optimum designs for user interfaces

Leapfrog CPOE/ EHR Testing Standard Compliments Other Initiatives



■ CCHIT (“on the shelf”)

- Certification of vendor EHR products
 - ✓ Ambulatory, Inpatient, Network

■ Pay-for-Performance Initiatives (“outcomes of IT and QI”)

- ✓ IHA, BTE, Others
- ✓ Ambulatory clinic site-specific reporting of select EHR functionality

■ National Quality Forum (“after implementation”)

- Hospital safe practices survey
 - ✓ Voluntary hospital site-specific certification
 - ✓ Includes several aspects of EHR including CPOE
 - ✓ **Now directly linked to Leapfrog CPOE Standard**

■ Leapfrog Group (“how *implemented* software is contributing”)

- Voluntary reporting with site-specific scoring
 - ✓ Hospital evaluation
 - ✓ Physician practice evaluation

The Leapfrog Group: Background

- IOM I: To Err is Human – recommended that purchasers provide market incentives for improved patient safety
- The Leapfrog Group: Launched in November, 2000 by the Business Roundtable
- Over 100 of the largest public and private corporations in America
- Purchase benefits for 31 million Americans (1 in 9!)
- Goal: safer care for employees through “Giant Leaps” in patient safety
- Approaches:
 - Reward hospitals for improving patient safety
 - Educate employees, retirees, families about hospital efforts

Sources: The Leapfrog Group, www.leapfroggroup.org; U.S. Census 2001



The Leapfrog Group

Leapfrog is an initiative driven by organizations that purchase healthcare to improve safety, quality, and affordability.

■ **Its initiatives have been influencing the entire healthcare market**

■ **Focus has been on hospital-based care to date**

- Intensivist coverage in ICUs
- Computerized physician order entry (CPOE) to reduce serious medication ordering errors
- Evidence-based hospital referrals
- NQF Safe Practices

■ **Next focus area is Ambulatory IT standards:**

- **Call for**
 - ▶ An electronic health record (EHR)
 - ▶ Prescription checking to avoid preventable medication-related adverse events
 - ▶ Basic disease and wellness management prompting
- **Are being coordinated with**
 - ▶ Commission for Certification of Healthcare Information Technology
 - ▶ Measures for large-scale P4P initiatives
 - ▶ NCQA Physician Practice Connection v.2

■ **Clinical decision support testing for physician medication ordering and e-prescribing in *implemented* systems**



THE LEAPFROG GROUP
for Patient Safety
Rewarding Higher Standards

Leapfrog's Inpatient CPOE Standard

■ Hospitals that fulfill this standard will:

- Require physicians of patients in hospitals to enter medication orders via a computer system that is linked to prescribing error prevention software
- Demonstrate that their CPOE system can intercept at least 50% of common serious prescribing errors, utilizing test cases and a testing protocol specified by The Leapfrog Group
- Require documented acknowledgment by the prescribing physician of the interception prior to any override post the test case interception rate on a Leapfrog-designated web site



Leapfrog Ambulatory Standard (2007)

- Physician practices that fulfill this standard will use an EHR with:
 - Information on age/gender diagnoses, medications, allergies, weight, and laboratory test results
 - Clinical decision support based on drug reference information that can intercept at least 50 percent of common prescribing errors
 - Reminders to aid clinicians in basic health maintenance guidelines of the U.S. Preventive Services Task Force and other widely-adopted sources



Leapfrog Software Standard

The Leapfrog Group needed a way to evaluate how software is actually being used from two perspectives.

Purchasers The Public	<ul style="list-style-type: none">■ How far along is this organization in using CPOE or ambulatory EHR to help improve medication safety and quality?
Hospital and Medical Practice Leadership	<ul style="list-style-type: none">■ Now that we have implemented CPOE or ambulatory EHR, how well are we doing in using it to help avoid harm and improve quality?



Leapfrog Evaluation Methodology

Development of the Evaluation Methodology

- Leapfrog engaged First Consulting Group and a panel of experts (David Bates, Marc Overhage, ISMP) to develop the tool
- Phase 1 – funding from CHCF and RWJF
- Phase 2 – funding from AHRQ
- Completed
 - ✓ Evaluation Method
 - ✓ Evaluation Content (test patients, test orders)
 - ✓ Pre-testing in implementation sites with every major vendor solution
 - ✓ Reliability and validity testing
 - ✓ Web application



Principles Behind the Evaluation Methodology

■ Principle #1: Target the Harm

- Common sources of ADE's (not errors)
- Sources of severe harm (existing literature and expert consensus)

■ Principle #2: Encourage Quality Improvement

- Categorize test set by type of error
- Provide feedback to the provider organization for each category
- Provide advice about nuisance alerting

■ Principle #3: Accentuate the positive

- Encourage care quality, as well as ADE reduction
 - ▶ Address errors of commission and omission
 - ▶ Include corollary orders and duplicate interventions




The Test Order Categories



Category	Example
<i>Therapeutic duplication</i>	Codeine AND Tylenol #3
<i>Single and cumulative dose limits</i>	10-fold excess dose of Methotrexate
<i>Allergies, cross-allergies</i>	Penicillin for patient with documented PCN allergy
<i>Contraindicated route of administration</i>	Tylenol to be administered intravenously
<i>Drug-drug, drug-food interactions</i>	Digoxin AND quinidine
<i>Contraindication based on patient dx</i>	Nonspecific beta blocker for an asthmatic
<i>Contraind/dose limit based on pt age, wt</i>	Adult dose of antibiotic in a newborn
<i>Contraind/dose limit based on laboratory study</i>	Normal dose regimen of gentamicin in patient with elevated creatinine
<i>Contraind/dose limit based on radiology study</i>	Iodine interacting med. in pt to receive CT with contrast
<i>Over Alerting/ Nuisance Reminders</i>	Use of orders with little potential for harm
<i>Test Gaming</i>	Use of Deception analysis and test time clock

The Evaluation Tool

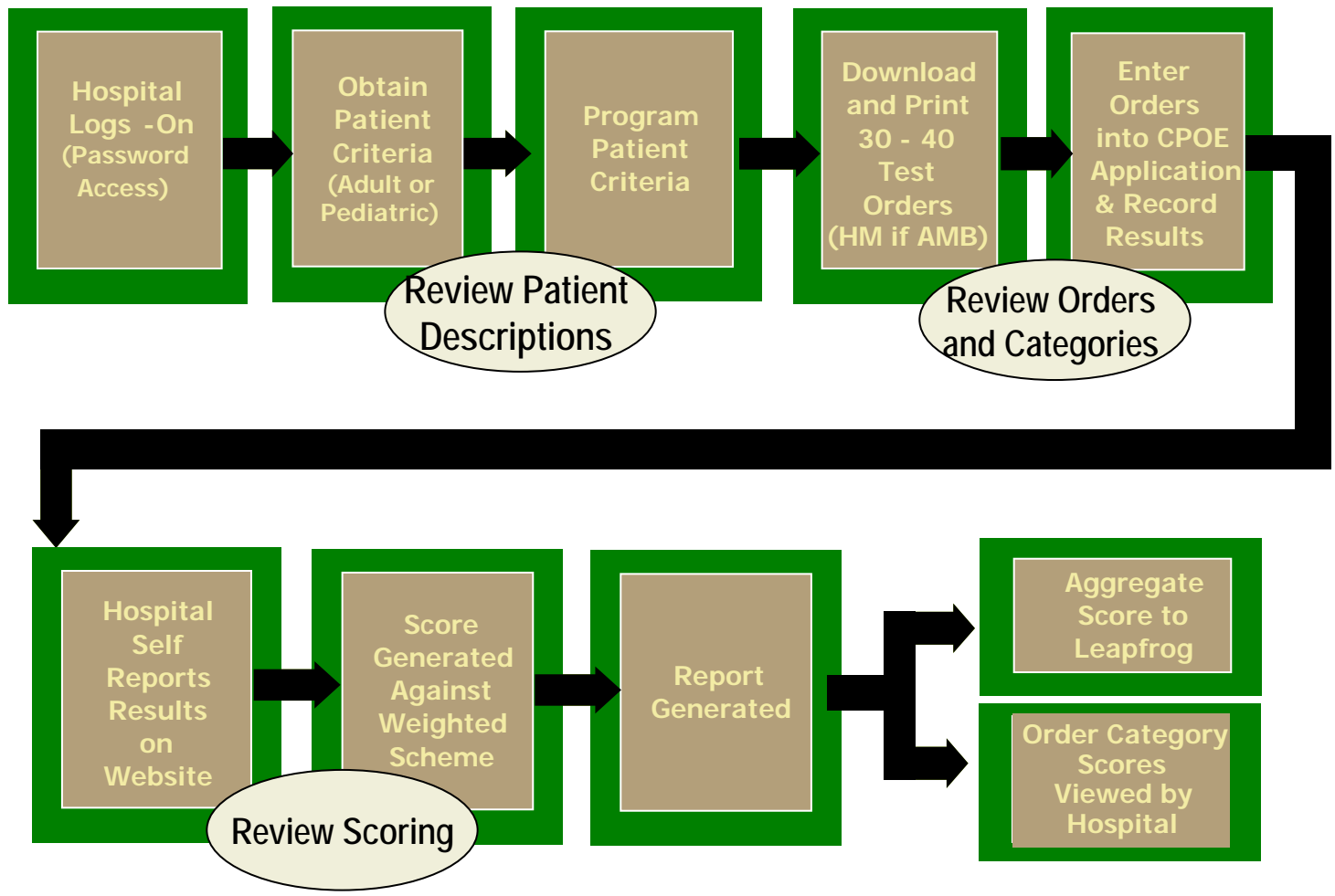
- Self-administered testing managed by a Web application
- Separate tests for pediatric and adult, inpatient and outpatient
- Test order set
 - To be entered into the site's CPOE system or EHR, against Leapfrog-supplied “test patients”
 - System responses recorded and reported back to Leapfrog (Overall score) and to the organization taking the test (detailed feedback)
- Test Orders representing nine categories of potentially dangerous errors developed by FCG and ISMP
- Three additional order categories developed based on literature and advisor experience
 - Corollary
 - Cost of care
 - Nuisance (important feedback)
- For ambulatory test: additional capability to test basic health maintenance prompting
- Output
 - Individual Site feedback report
 - Overall score for Leapfrog Web site 



Web-based Evaluation Tool



Web-based Evaluation Methodology





Welcome to the Leapfrog Computerized Physician Order Entry (CPOE) Web-based evaluation. The CPOE Evaluation is a remote test for use by hospitals and ambulatory care offices to assess their compliance with The Leapfrog Group's CPOE and ambulatory standards

The overarching goal is to assist
The Leapfrog Group in its nationwide effort to
improve patient safety.

If you are already a member, Sign in here

Hospital ID:
Security Code:
User Name:
Password:

[Forgot password?](#)

Only member hospitals and ambulatory care offices can take the CPOE evaluation test. To become a member, please contact the Administrator at ###-###-#### to obtain an ID and security code. You should receive a security code via e-mail within two business days. If you have any questions, please call The MedStat Group at (734) 913-3333.

- You must use your security code to gain access to the CPOE Test instructions, content, and to submit your responses to the CPOE questions and test.
- For multi-hospital systems, each hospital will need to obtain its own unique ID and security code.

Note: This application loads properly only in Internet Explorer.

Select Evaluation Type

CPOE Evaluation Application - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail Stop Taskbar

Address <http://61.14.8.113/leapfrog/user/downloadpatient.asp?OrgType=> Go Links >>

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To begin the 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 the patient description list, program the patient descriptions into the appropriate applications in your CPOE production or mirrored production environment, return to this site and download the order set for testing.

Please select CPOE Evaluation Type:
This field will determine the type of CPOE Test that you will receive.
You can only select one type at a time.

Select one
Select one
Pediatric inpatient
Adult ambulatory

Download Patients

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Print Instructions

Please read all directions carefully. **Once you begin the download and testing process, you are committing your health care organization to the public record regarding its ability to complete the LeapFrog CPOE evaluation.** Failing to complete the testing process once download of the test material has been initiated will result in your health care organization being denied the opportunity to re-take the test for **six months**. During this time your health care organization will be listed on a public Website as having not completed the LeapFrog CPOE test. Therefore, you should not proceed with downloading the test unless you are prepared to complete the testing process and submit your results to the Leapfrog Group.

The CPOE and evaluation process contains three steps:

1. Obtain and Program Patient Descriptions;
2. Obtain (download) Orders and Complete Order Entry; and
3. Submit Results.

The first step has a time limit of four hours for you to program the patient descriptions (e.g., demographics, allergies, laboratory values) into the appropriate applications in your test environments. If you do not complete this step and process to Step 2 (downloading orders) within 4 hours, the system will "time out," and you will be blocked from retaking the test for six months. During this time your health care organization will be listed on the Leapfrog Website as having not completed the LeapFrog CPOE evaluation.

You will then have two hours to complete the second and third steps (Obtain Orders and Complete Order Entry; and Submit Results). During this time you will download and print adult or pediatric orders, enter the orders into the CPOE application, record the results initially on the printout; and return to this web site to submit your results. If you are taking the ambulatory evaluation process you may also apply the same process as described above to the ambulatory adult or pediatric health maintenance evaluation.

Again, failure to complete this process within two hours following download of the test orders will result in a "time out" and you will be blocked from retaking the test for six months. Please read and review the detailed instructions below before you precede any further

Please read all directions carefully. You can take four different types of evaluations:

1. Adult Inpatient
2. Pediatric Inpatient
3. Adult Ambulatory
4. Pediatric Ambulatory

Both inpatient evaluations are testing the clinical decision support implemented in your CPOE system. The adult and pediatric evaluation also test for clinical decision support in a provider's office electronic medical record in supporting improved safety in medication prescribing, but also tests for delivery of recommended care through health maintenance test patient scenarios. Only in the ambulatory adult and pediatric evaluation is a second component that evaluates the use of health maintenance care reminders. This requires a patient-specific database, which includes age, gender, allergies, diagnoses, treatment codes, lab test results, patient history, and medications; and tools that incorporate rules for generating reminders. The adult and pediatric scenarios that are created for evaluation of health maintenance are based upon a comprehensive review of AHRQ Preventive Guidelines / US Preventive Services task Force, HEDIS, and Bridges to Excellence / DOQ-IT guidelines and in accordance with The Leapfrog Group recommendations of recommended targets. They have also been checked against the recently released consensus standards for ambulatory care released by the National Quality Foundation.

DURING THE TEST

Once you have obtained the CPOE Evaluation orders, you will have **two hours** to complete order entry into your production environment and enter your results back to the web site. The evaluation process is 'complete' after you have entered the results onto the web site.

Print Patient Descriptions

Patient Id	Adult Inpatient Description
1	Age: 51 years Sex:Female Weight: 48 kg Allergies: Pencillin,Egg Diagnosis/Problem: Seizure Disorder Lab Values: Potassium = 2.4 mEq/L
2	Age: 43 years Sex:Male Weight: 70 kg Allergies: Aspirin,ShellFish Lab Values: Vancomycin trough = 17 mcg/ml,Clostridium Difficile Toxin Assay = Negative
3	Age: 41 years Sex:Male Weight: 70 kg Allergies: No Known Drug Allergies Lab Values: Platelets = 15,000/cc.mm Patient Specifics: Last Fibrin Split Product (FSP) 3 hours ago
4	Age: 52 years Sex:Female Weight: 60 kg Allergies: Morphine Lab Values: :International Normalized Ratio (INR) = 7,Digoxin level = 0.8 ng/m
5	Age: 49 years Sex:Female Weight: 60 kg Allergies: No Known Drug Allergies Lab Values: Serum Creatinine = 1.2 mg/dl
6	Age: 28 years Sex:Female Allergies: No Known Drug Allergies Diagnosis/Problem: Pregnant Lab Values: Urinalysis (U/A) = Normal,Urine Culture & Sensitivity (Urine C&S) = No Growth
7	Age: 75 years Allergies: No Known Drug Allergies Diagnosis/Problem: Hemorrhagic stroke
8	Age: 43 years Weight: 75 kg Height: 175 cm Allergies: No Known Drug Allergies Lab Values: Theophylline level = 15 mg/L,Potassium = 4.0 mEq/L Patient Specifics:Had iodinated contrast study 3 hours ago

Once you print the Patient Descriptions, please **log out** and enter the descriptions into your production or mirrored production environment. When you are finished, return to this site, log in and download the orders.

[Sign out](#)

Obtain Patient Descriptions

CPOE Evaluation Application - Microsoft Internet Explorer

Address: http://61.14.8.113/leapfrog/user/downloadpatient.asp

9	90 years	Male		Allergies	Dementia		
10	49 years	Female	75Kg,175 cm	No Known Drug Allergies Peanut Allergy	Chronic Obstructive Pulmonary Disease	Theophylline level = 15 mg/L Potassium = 4.0 mEq/L	none
11	17 years	Female	45Kg	No Known Drug Allergies	Acne		

Health Maintenance Component

Patient Id	Age	Sex	Weight	Allergies	Diagnosis/Problems	Lab Values	Specifics
HM1	68 years	Female	90 Kg	No Known Drug Allergies	Coronary Artery Disease(CAD), S/P Myocardial Infarction	Last LDL-C = 120, HDL-C = 30; 18 months ago	No current medications on Medication List
HM2	67 years	Male	100 Kg	No Known Drug Allergies	Adult Onset	Last LDLC = 130, Last HDLC = 28; 18 months ago	No Hemoglobin A1C documented, Last dilated eye exam 18 months ago (health maintenance)
HM3	81 years					none	No Medication on Medication List
HM4	67 years	Male	60 Kg	No Known Drug Allergies	Chronic Obstructive Pulmonary Disease	Last Influenza Vaccine 3 years ago, Last tetanus Vaccine 25 years ago	No History of Pneumococcal vaccine
HM5	55 years	Female	100 Kg	No Known Drug Allergies	Obesity	Last Mammogram 5 years ago, Last Pap Smear 5 years ago	No History of Flexible sigmoidoscopy or colonoscopy

Once you print the Patient Descriptions, please **log out** and enter the descriptions into your production or mirrored production environment. When you are finished, return to this site, log in and download the orders.

[Sign out](#)

Download Orders and Worksheet

CPOE Evaluation Application - Microsoft Internet Explorer

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Back Forward Stop Home Search Favorites Refresh Print Mail Print Print Preview Home

Address http://61.14.8.113/leapfrog/user/downloadorders.asp Go Links

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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.

Print Orders

Number	Order	Patient	Result (Check One)
1	Levothroid 200 mcg po twice daily	1	<input type="checkbox"/> Alert or Information Received or Order Blocked,DisPlyed Message: _____ <input type="checkbox"/> Order Accepted, No Alert or Information Received <input type="checkbox"/> Medication Not on Formulary
2	Cephalexin 250 mg po four times a day	1	<input type="checkbox"/> Alert or Information Received or Order Blocked,DisPlyed Message: _____ <input type="checkbox"/> Order Accepted, No Alert or Information Received <input type="checkbox"/> Medication Not on Formulary
3	Lovenox 80 mg subcutaneous every 12 hours	1	<input type="checkbox"/> Alert or Information Received or Order Blocked,DisPlyed Message: _____ <input type="checkbox"/> Order Accepted, No Alert or Information Received <input type="checkbox"/> Medication Not on Formulary
4	Demerol 50 mg po every 4 to 6 hours as needed	1	<input type="checkbox"/> Alert or Information Received or Order Blocked,DisPlyed Message: _____ <input type="checkbox"/> Order Accepted, No Alert or Information Received <input type="checkbox"/> Medication Not on Formulary
5	1) Metoprolol 50 mg po twice daily,2) Toprol XL 100 mg po daily	2	<input type="checkbox"/> Alert or Information Received or Order Blocked,DisPlyed Message: _____ <input type="checkbox"/> Order Accepted, No Alert or Information Received <input type="checkbox"/> Medication Not on Formulary
6	1) Lotrel 5 mg/10 mg po daily,2) Enalapril 5 mg po daily	2	<input type="checkbox"/> Alert or Information Received or Order Blocked,DisPlyed Message: _____ <input type="checkbox"/> Order Accepted, No Alert or Information Received <input type="checkbox"/> Medication Not on Formulary
7	Hydrocodone/Acetaminophen 5 mg/500 mg (Vicodin) 2 tablets po every four hours	2	<input type="checkbox"/> Alert or Information Received or Order Blocked,DisPlyed Message: _____ <input type="checkbox"/> Order Accepted, No Alert or Information Received <input type="checkbox"/> Medication Not on Formulary
8	Vicodin ES one tablet every 6 hoursTylenol 500mg po every 4 hours prn	2	<input type="checkbox"/> Alert or Information Received or Order Blocked,DisPlyed Message: _____

Download Health Maintenance Worksheet

The screenshot shows a Microsoft Internet Explorer browser window titled "CPOE Evaluation Application - Microsoft Internet Explorer". The address bar displays "http://61.14.8.113/leapfrog/user/downloadorders.asp". The main content area contains two sections, HM4 and HM5, each with a list of health maintenance items. A dialog box is overlaid on the page, displaying a warning icon and the text: "You will have TWO hours to return to this site and submit the results." with an "OK" button. At the bottom right of the page, there is a "Sign out" button. The footer text reads: "Powered by First Consulting Group - The leader in healthcare and life sciences www.fcg.com".

Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites

Address http://61.14.8.113/leapfrog/user/downloadorders.asp Go Links

HM4

- TB
- None of the above
- Aspirin Use
- Beta Blocker Use
- Ace Inhibitor Use
- Influenza (Flu Vaccine)
- Pneumovax
- Tetanus (Td)
- MMR
- DTaP
- Papanicolaou (Pap) Screening
- Mammography Screening
- Colorectal Screening
- Syphilis Screening
- Lipid Measurement / Management
- Scheduling of periodic INRs
- HBA1C Measurement / Management

HM5

- Influenza (Flu Vaccine)
- Pneumovax
- Tetanus (Td)
- MMR
- DTaP
- Papanicolaou (Pap) Screening
- Mammography Screening
- Colorectal Screening
- Syphilis Screening
- Lipid Measurement / Management
- Scheduling of periodic INRs
- HBA1C Measurement / Management
- Ophthalmology Exam
- TB
- None of the above

Sign out

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Submit Responses

CPOE Evaluation Application - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Recycle Bin Mail Desktop Search Word Pad Internet Explorer

Address http://61.14.8.113/leapfrog/user/SubmitResults.asp Go Links

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You are now ready to submit your responses for the medication order entry portion. 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. Next you will be taken to the health maintenance component to record those results.

Number	Order	Result
1	Levothroid 200 mcg po twice daily	<input type="radio"/> Received advice or information on medication dose limits <input type="radio"/> Placed order and did not receive advice or information on medication dose limits <input type="radio"/> Medication Not on Formulary
2	Cephalexin 250 mg po four times a day	<input type="radio"/> Received advice or information on allergies to medication <input type="radio"/> Placed order and did not receive advice or information on allergies to medication <input type="radio"/> Medication Not on Formulary
3	Lovenox 80 mg subcutaneous every 12 hours	<input type="radio"/> Received advice or information on patient age or medication dose adjustment <input type="radio"/> Placed order and did not receive advice or information on patient age or medication dose adjustment <input type="radio"/> Medication Not on Formulary
4	Demerol 50 mg po every 4 to 6 hours as needed	<input type="radio"/> Received advice or information on drug:diagnosis interactions <input type="radio"/> Placed order and did not receive advice or information drug:diagnosis interactions <input type="radio"/> Medication Not on Formulary
		<input type="radio"/> Received advice or information on therapeutic duplication

Submit HM Responses

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You are now ready to submit your responses for the health maintenance component. Please take your time and carefully enter your responses. **Multiple results per patient can be entered.** Once you have completed entering all results, click on the bottom of this page to record your results. Next you will be taken to the display score page.

Note: Hold Shift key for multiple contiguous entries. Hold the Ctrl key to select non-contiguous entries

Preventive Patient ID	Reminders
HM1	Aspirin Use Beta Blocker Use Ace Inhibitor Use Influenza (Flu Vaccine) Pneumovax
HM2	Aspirin Use Beta Blocker Use Ace Inhibitor Use Influenza (Flu Vaccine) Pneumovax
HM3	Aspirin Use Beta Blocker Use Ace Inhibitor Use Influenza (Flu Vaccine) Pneumovax
HM4	Aspirin Use Beta Blocker Use Ace Inhibitor Use Influenza (Flu Vaccine) Pneumovax
HM5	Aspirin Use Beta Blocker Use Ace Inhibitor Use Influenza (Flu Vaccine) Pneumovax

Submit Results

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View Results

http://61.14.8.113/leapfrog/user/SumitHealthResults.asp?Count=5 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail

Address http://61.14.8.113/leapfrog/user/SumitHealthResults.asp?Count=5 Go Links

Medication Checking	Score (in percent)
Therapeutic Duplication	88.00
Single and Cumulative Dose Limits	14.00 *
Allergies and Cross Allergies	67.00
Drug:Drug interactions	50.00
Drug:Diagnosis interactions	100.00
Contraindication / Dose Limits Based on Age and Weight	64.00
Contraindication / Dose Limits Based on Laboratory Studies	33.00
Corollary Orders	50.00
Deception Analysis	33.00
Nuisance Orders	100.00

Health Maintenance Checking	Score (in percent)
Sensitivity	24 %
Specificity	85 %
Accuracy	73 %

Your TOTAL score reflects:

Medication Checking: Good progress in implementing recommended safety practice

Note: Medication checking Total score does not include Nuisance and Deception Analysis categories

Legend	Description
	Did not meet criteria for a good early stage effort
	Good early stage effort in implementing recommended safety practice
	Good progress in implementing recommended safety practice
	Fully implemented recommended safety practice
	Did not complete the evaluation or did not report results

*The order entry system accepted the following order(s) that could have caused severe harm:

Category	Order Description
Single and Cumulative Dose Limits	Vicodin ES one tablet every 6 hours Tylenol 500mg po every 4 hours prn

FOR ADDITIONAL INFORMATION, REVIEW THESE LINKS

How the Leapfrog Evaluation Can Be Used---Case Example



Case Example: One Inpatient Test Site

Grading on CDS in place in CPOE

Therapeutic Duplication	B-
Drug-Allergy	C+
Drug-Drug Interactions	C (no drug-food)
Normal Order Alerts	A-

Case Example: One Inpatient Test Site

Grading on test categories not adequately addressed.

Corollary Orders	F
Duplicate Test	F
Dose Limits	F
Drug-disease	F
Drug-Lab	F
Wrong route	D-

Case Example: One Inpatient Test Site

Initial thoughts of the organization in response to the test

■ **What I knew we would do poorly on:**

- Drug-lab, drug-disease, dose limits

■ **What I was surprised at:**

- Drug-drug and drug-allergy

■ **What I had not begun to think about yet:**

- Wrong route, corollary orders, duplicate test

■ **Where I thought the test missed a problem**

- Duplicate therapies

Case Example: One Inpatient Test Site



Organization's Plan to improve grades and build an effective CDS strategy

- **First**: Cut down on alert messages that appear to be less effective.
 - Reduce duplicate messages by excluding some messages that pertain to PRN drugs.
 - Reduce the overall number of drug interaction messages by building them from the “ground up” as opposed to “top down.”
- **Next**: Implement the most highly useful drug dosing messages.
 - Create a partnership with a content company to help build a highly customized and useful knowledge base.
- Follow with more work on surrogate outcomes and actual outcome measurements.
- Continue to roll through the drug-disease and corollary areas based on the findings as we move along.

Case Example: One Inpatient Test Site



What they did with the results.

- Pharmacy review of pre-configured allergy and drug-drug alerts.
- Review of important food allergies (not so easy as you might think...)
- Pharmacy/physician review of important corollary orders.
- Incorporate new functions into our next big re-build of the CPOE system
- Create a CDS Dashboard

Case Example: One Inpatient Test Site



Organizations conclusions

■ Benefits of the test:

- Makes very transparent the quality of reactive alerts for errors of commission
- Provides a very nice impetus to get started on fixing up your CDS
- When linked to public reporting that impetus will be that much stronger
- Provides a clear set of categories to help plan your CDS improvement strategy

What We Learned About the State of the Practice with CDS



State of Medication Checking CDS

Current capabilities do not cover the order categories our project advisors feel are important.

Generally available Generally used	<ul style="list-style-type: none">■ Drug-drug interaction checking■ Drug-allergy checking
Generally available Often not used	<ul style="list-style-type: none">■ Therapeutic overlap checking■ Dose range checking■ Corollary orders (e.g., blood levels)
Not available	<ul style="list-style-type: none">■ Contraindication based on age, pregnancy, Dx, route of administration■ Patient-specific dosing (age/wt, renal dosing)■ Combination drugs



Questions?



Comments

