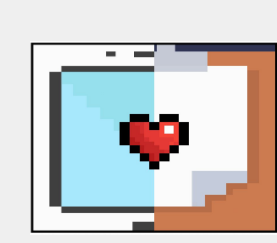


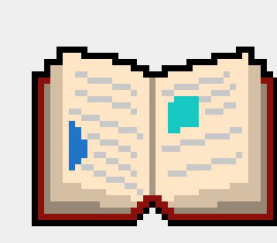
MED439
King Saud
University



Academic
Leaders



Medical
informatics
439



*THE
REFERENCE*



*EDITING
FILE*



Medical Informatics

Lecture 1 Lecture 2 Lecture 3 **Lecture 4** Lecture 5

Lecture 6

Lecture 4

COMPUTERIZED PHYSICIAN ORDER ENTRY

Color index:

Main Text | Female Slides | Male Slides | Extra
| Important | Dr's Notes | Golden notes |
Textbook

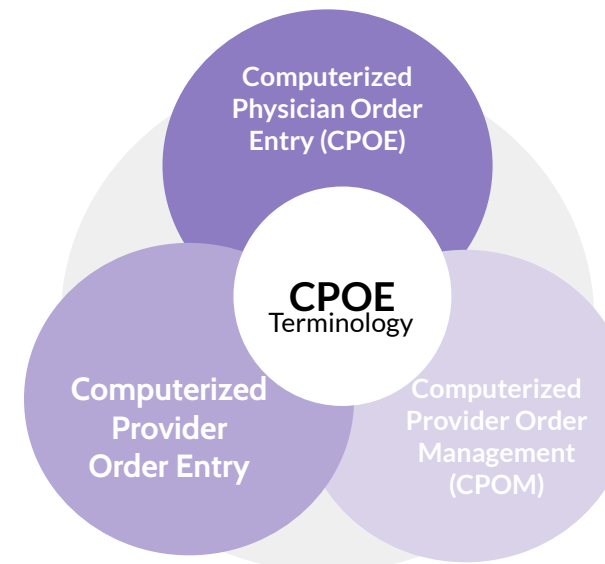
[Computerized Physician Order Entry.pdf](#)

Outline

- Definition and context
- Why CPOE?
- Advantages of CPOE
- Disadvantages of CPOE
- Outcomes measures and examples
- Same system other outcome

What CPOE does?

- Provides Decision support **this is the main purpose**
- Warns of Drug Interactions (Drug-Drug, Drug-Allergy, Drug-Food)
- **Checks Dosing**
- Reduces Transcription Error
- Reduces number of lost orders
- Reduces duplicative diagnostic testing **which will save time and effort.**
- Recommends cost effective, therapeutic alternatives **and plans.**



CPOE is:

- The process where a medical professional entering orders or instructions **electronically.**
- A process of electronic entry of medical practitioner instructions for the treatment of patients.
- Computerized Provider Order Entry or Computerized Provider Order Management (**CPOM**).
- The process of capturing a physician's instructions for a patient's care electronically to **improve the efficiency of care delivery.**
- CPOE is a computer application that accepts physician orders such as : **Meds, Laboratory Tests, Diagnostic Studies, Ancillary Support, Nursing Orders, Consults.**

What is CPOE? (Main characters)

- **Ordering of tests, medications, and treatments** for patients care using computers
- it involves **electronic communication** of the orders. *So the order is not only placed on the computer it's transmitted through the system.*
- Often uses **rule-based methods for checking appropriateness of care.**
- In addition it's helping in **documentation**

Meaning of **rule based**: it gives decision supports. For example if you order a procedure/ test for pregnancy, you won't be able to order it for a male patient, the system will reject the order. Same goes for allergies, drug Interactions, etc.

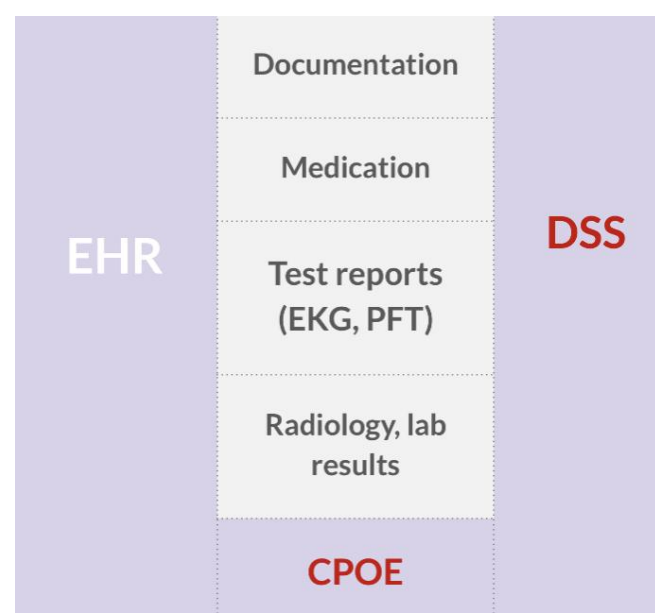
Definitions

Information system is an arrangement and integration of **four things, Data, Processes, People** and **Technology** which interact to **collect, process, store and provide** as output the information needed to support the organization.

CPOE: A solution to a current human system problem that focuses on achieving improved quality and safety for all patients **with the best documentation available.**

Technical infrastructure

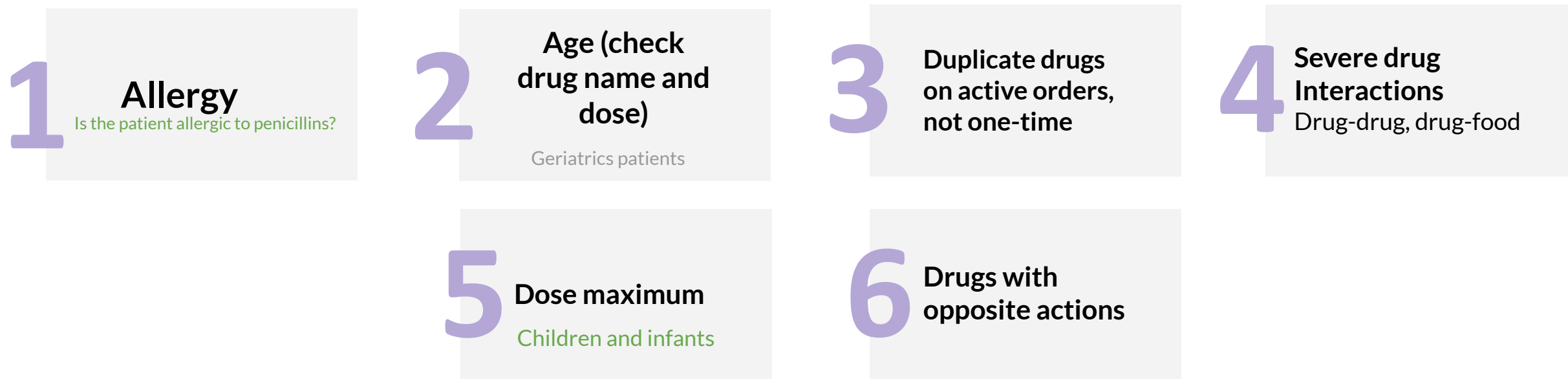
- **EHR**
- **Drug information database**
- **DSS**
- **Other**



The main infrastructure technology needed to have CPOE is EHR, in addition to documentation, medications, test reports and results. All these elements are needed to run the CPOE. CPOE also needs DSS to fully function.

Computerized Physician Order Entry

Examples of DSS in CPOE – medication prescription:



Why now?

November 1999: Report from the Institute of Medicine *to Err is Human: Building a Safer Health System* “44,000-98,000 patient deaths/year in U.S. hospitals due to medical errors” .

- Increased focus on **patient safety** and on **quality of care**.
- CPOE is viewed as an important tool to improve patient safety and quality of care delivered.

Top 10 Causes of Death 1998

1. Heart Disease 724,269	6. Pneumonia 94,828
2. Cancer 538,947	7. Diabetes 64,574
3. Stroke 158,060	8. Motor Vehicle 41,826
4. Lung Disease 114,381	9. Suicide 29,264
5. Medical Errors 98,000	10. Kidney Disease 26,295

Institute of Medicine:

- Report on medical errors released 1999.
- Adverse events occur in 2.9 to 3.7% of all hospitalization.
- Estimated that between 44,000 and 98,000 hospital deaths/year are due to medical errors.
- Some question the accuracy of the estimates but has raised public awareness and concern.
- “The science and technologies involved in healthcare, skills, care interventions, devices and drugs) have advanced more rapidly than our **ability** to deliver them **safely, effectively, and efficiently.**”

Current Objectives:

01

Endorsement of CPOE.

02

Establish CPOE as an institutional commitment.

It should be a strategic goal for any institution

03

Identify CPOE as a quality and safety improvement initiative.

Definitions

These definitions were found in the lecture recording but not in the handout.

- **EMR (Electronic Medical Record):**
 - The set of databases (lab, pharmacy, radiology, clinical notes, etc.) that contains the health information for patients within a given institution or organization.
- **CDS (Clinical Decision Support) component:**
 - Software that makes relevant information available for clinical decision-making (clinical data, references, clinical guidelines, situation-specific advice)
- **CPOE (Computerized Physician Order Entry) component:**
 - **Enables clinicians to enter orders (tests, meds, dietary, etc.).**
- **CCR (Computerized Clinical Reminder):**
 - just-in-time reminders at the point of care that reflect evidence-based medicine guidelines.

Medical Errors

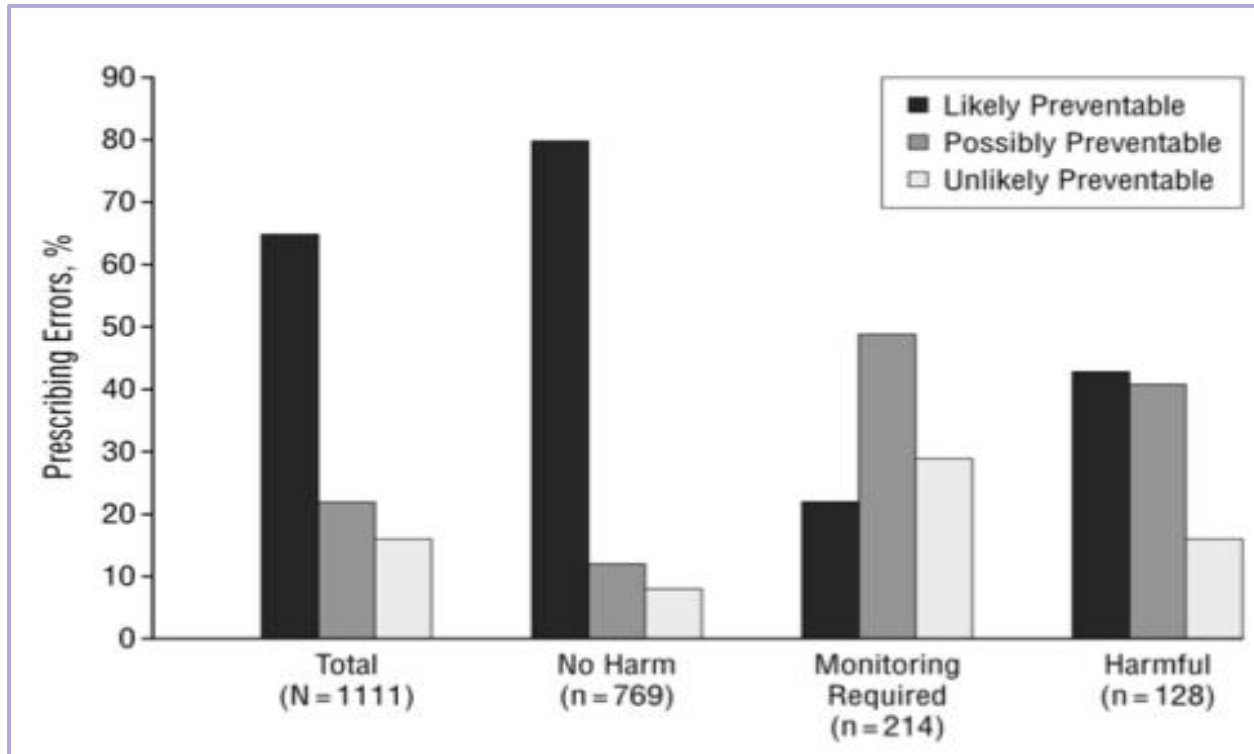
Medication errors resulting in preventable ADEs **most commonly** occur at the **prescribing stage**.

- Out of 1111 prescribing errors were identified (6.2% errors), most occurring on admission (64%). Of these, 30.8% were rated clinically significant and were most frequently related to;
 - anti-infective medication orders,
 - incorrect dose.
 - medication knowledge deficiency.
- 64.4% were rated as likely to be prevented with CPOE.
- 13.2% unlikely to be prevented with CPOE.
- 22.4% possibly prevented with CPOE depending on specific CPOE system characteristics.

This is a good study that shows the classification of errors and how to eliminate and manage these errors using CPOE.



The graph and the table are from the same study Both aren't not in the handout but explained by the doctor



Severity of prescribing errors and rated preventability by use of a computerized prescriber order entry system.

-About 65% of 1111 prescribing errors could've been prevented by using cpoe and about 20% can be (possibly) prevented, and 15% aren't likely to be prevented by cpoe.

-Of the 1111 prescribing errors, most occurred in the unlikely to have caused harm category (69.2%), followed by ratings of likely to have required monitoring (19.3%). The least amount of errors (n = 128; 11.5%) occurred in the likely to have produced patient harm.

Table 1. Examples of Prescribing Errors Rated as Likely, Possibly, or Unlikely to Be Prevented With Computerized Prescriber Order Entry (CPOE) and the Most Likely Proximal Cause of the Error

Classification	Examples	Proximal Cause
Likely to be prevented with CPOE	Diltiazem, 240 mg by mouth daily. Sustained-release formulation not specified.	Medication knowledge deficiency
	Unasyn (ampicillin sodium/sulbactam sodium) prescribed for a patient with a penicillin allergy (allergy documented on order).	Medication knowledge deficiency
	Fluconazole, 400 mg × 1 dose, then 200 mg daily (intravenous vs oral not specified).	Slip
Possibly prevented with CPOE	Azathioprine, 200 mg by mouth 3 times per day. Order clarified to 200 mg by mouth daily.	Medication knowledge deficiency
	Change in amikacin dose and frequency based on age, creatinine clearance, and weight.	Medication knowledge deficiency
	Chemotherapy ordered without posttherapy antiemetics (per protocol).	Slip
Unlikely to be prevented with CPOE	Hormone patch daily (patient did not know what she was taking at home).	Patient knowledge deficiency
	Order for carmustine written. Pharmacist clarified that carmustine only to be given if patient was unable to swallow hydroxyurea, which was also ordered.	Slip
	Ritonavir, 200 mg by mouth twice per day ordered. Patient was appropriately taking 400 mg by mouth twice per day prior to admission.	Transcription error

Examples of Prescribing Errors Rated as Likely, Possibly, or Unlikely to Be Prevented With Computerized Prescriber Order Entry (CPOE) and the Most Likely Proximal Cause of the Error.

Two Harvard studies found that physician ordering errors accounted for 56%-78% of all preventable Adverse Drug Events.

Physician drug ordering errors are most often due to one of two causes:

1. Lack of knowledge about the drug
 - Wrong dose.
 - Wrong frequency.
 - Drug-drug interaction.
2. Incomplete patient information.
 - Documented allergies.
 - Recent lab results.

Not in the handout but explained by the doctor

Table 3. Most Common Error Types for Clinically Significant Prescribing Errors and the Likelihood of Preventability With Computerized Prescriber Order Entry*

Error Category	Likely Preventable	Possibly Preventable	Unlikely Preventable
Dose (n = 134)	27 (20)	69 (52)	38 (28)
Frequency (n = 69)	17 (25)	35 (50)	17 (25)
Nomenclature (n = 32)	24 (75)	7 (22)	1 (3)
Drug allergy (n = 22)	16 (73)	5 (22)	1 (5)
Incorrect medication (n = 22)	5 (23)	6 (27)	11 (50)
Omission (n = 16)	5 (31)	4 (25)	7 (44)
Duplication (n = 12)	0 (0)	10 (83)	2 (17)
Route (n = 10)	2 (20)	6 (60)	2 (20)
Drug interaction (n = 7)	3 (43)	3 (43)	1 (14)
Other (n = 18)	4 (22)	11 (61)	3 (17)
Total (N = 342)	103 (30)	156 (46)	83 (24)

*Data are number (percentage) of errors. Percentages may not add to 100 due to rounding.

-103 errors out of 342 are likely preventable using CPOE.
 -156 errors out of 342 are possibly preventable using CPOE.
 -83 errors out of 342 are unlikely to be prevented using CPOE.

ADEs

Adverse drug events (ADEs) are the most common cause of injury to hospitalized patients and are often preventable.

- A CPOE with an advanced level of CDS is needed to prevent many of the prescribing errors with the greatest potential to lead to patient harm.
 - **Basic** = drug-allergy, drug-drug interaction & duplicate therapy checking, basic dosing guidance, formulary decision support.
 - **Advanced** = dosing for renal insufficiency and geriatric patients, guidance for medication-related lab testing, drug-pregnancy and drug- disease contraindication checking.

Adverse Drug Reactions (ADR)

- Several studies have found a serious medication error in 3.4%- 5.3% of inpatients.
- The cost of a single preventable ADE is \$4,685 • \$1.3 million annually for an average 300 bed hospital.

CPOE Can Help Reduce Errors

- Brigham and Women's Hospital launched its first CPOE in 1993.
- Since then, they have documented a 54% reduction in serious medication errors.
- Resulted in 62% reduction in preventable ADE's.

Quality and Efficiency

CPOE allows for physician reminders of best practice or evidence-based guidelines.

- Indiana University study:
 - Pneumococcal Reminders vaccine in eligible patients
 - 0.8% → 36%
 - Heparin prophylaxis
 - 18.9% → 32%

Improved Quality

Improved Efficiency

Maimonides Medical Center (Bronx, NY), 700 bed teaching hospital.

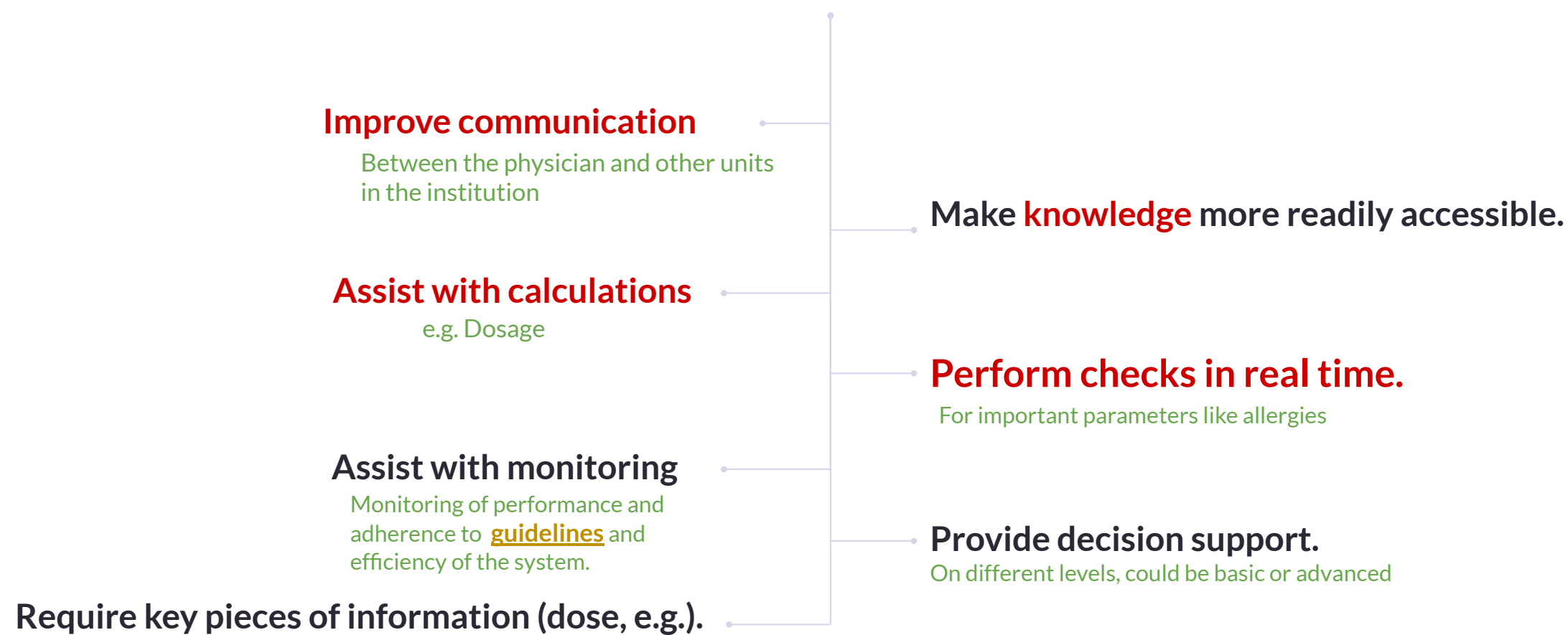
After CPOE, found substantial reduction in order processing time:

- Physician order to receipt by pharmacy:
 - 3.4 hours → 0.5 hours
- Physician order to Delivery to Patient Care Area:
 - 4.6 hours → 1.4 hours
- Estimate 12% ↓ in LOS following CPOE.

Safety & Quality responsibilities

- Drug-Drug interactions.
- Drug-Disease interactions:
 - Renal dosing
 - Hepatic dosing
 - Heart failure
 - Asthma
- Pediatric/Neonatal weight based dosing.
- **Medication Reconciliation.** (CPOE improves medical reconciliation)

Advantages of CPOE



CPOE

- In 2005, only 4% of hospitals are in full compliance with CPOE; 17% have made good progress.
- **Government and larger teaching hospitals are more likely to have implemented CPOE.**
- Effective in reducing the rate of serious medication errors.
- Reduction in antibiotic-related ADEs after implementation of decision support for these drug.
- Length of stay at Wishard Memorial Hospital in Indianapolis fell by 0.9 days, and hospital charges decreased by 13% after implementation of CPOE.
- A study at Ohio State University also identified substantial reductions in pharmacy, radiology and laboratory turnaround times, and there was a reduction in length of stay in one of the two hospitals studied.
- Research estimates that implementation of CPOE systems at all non-rural U.S. hospitals **could prevent three million adverse drug events each year.**

Reasons For CPOE

Order Communication	Standardization of care	Alerts and Reminders
<ul style="list-style-type: none"> • Clarity of Orders. • Ease of Identifying the Ordering Physician. <p>Easy to communicate with the physician who prescribed certain medications.</p>	<p>Clinically validated order sets for:</p> <ol style="list-style-type: none"> 1. Clinical diagnoses 2. Procedures 3. Situations (post-op order sets) <p>It facilitates enforcement of clinical guidelines.</p>	<p>(Real time decision support)</p> <ul style="list-style-type: none"> • Drug Safety Database (Conflict Checking). • Clinically validated rules.

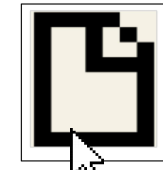
Examples

Examples of improved adherence to guidelines

- Reduced to zero after implementation

This is one of the key elements and advantages of CPOE, it shows how CPOE helps in the adherence and compliance of clinicians to guidelines and to the best practices. E.g. Prescribing medications has improved after CPOE implementation. The graph shows weeks before and after CPOE implementation.

When maximum dose was evaluated, it was found that in the pre-order (before CPOE implementation) entry sample, 2.1% of medication orders called for maximum doses that exceeded the highest recommended dose. In the first post-order (after CPOE implementation) entry month, this decreased to 0.56%. The proportion of orders exceeding the maximum recommended dose continued to decrease in subsequent years (0.31% at 1 year; 0.24% at 2 years), possibly because of increased use of order sets.



Click here to read the paper

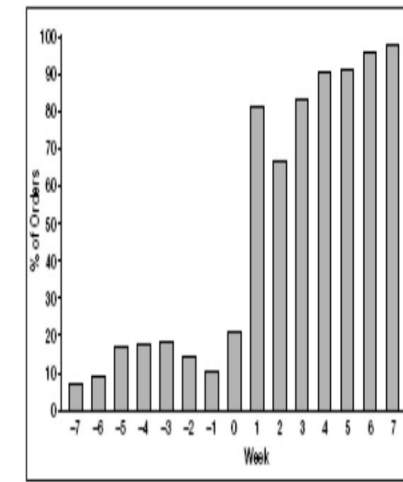


Figure 3. Change in use of nizatidine, as a percentage of all oral histamine-blocker orders, after the computer intervention was introduced (Week 0).

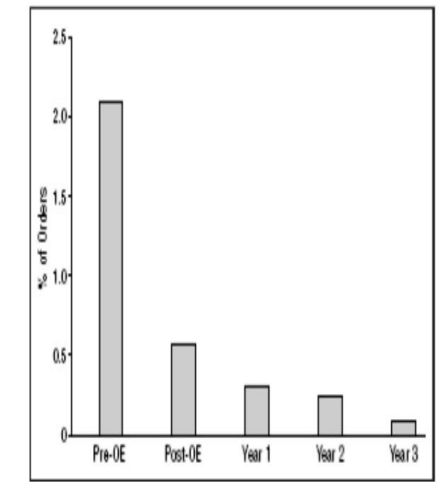


Figure 5. Percentage of medication orders with doses exceeding the recommended maximum.

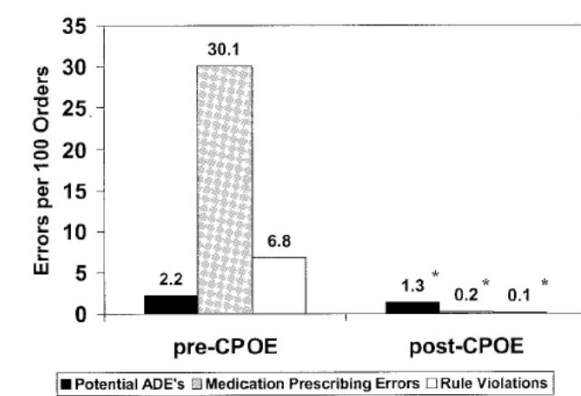
Examples of reduced errors

- Potts studied ADE rates in 13,828 medication orders before/after CPOE implementation at Vanderbilt Children's PICU.
- This helped in reinforcing regulations & guidelines

In this study, CPOE significantly reduced all categories of errors. Medication prescribing errors and rule violations were virtually eliminated, and potential ADEs were reduced by 40.9%. In addition, during the study, there were no reports of errors caused by the CPOE system, including no reports of orders being entered on the wrong patient.



Click here to read the paper



Potts AL, Barr FE, et al. Pediatrics. 2004 Jan;113(1 Pt 1):59-63.

Examples of Introducing errors

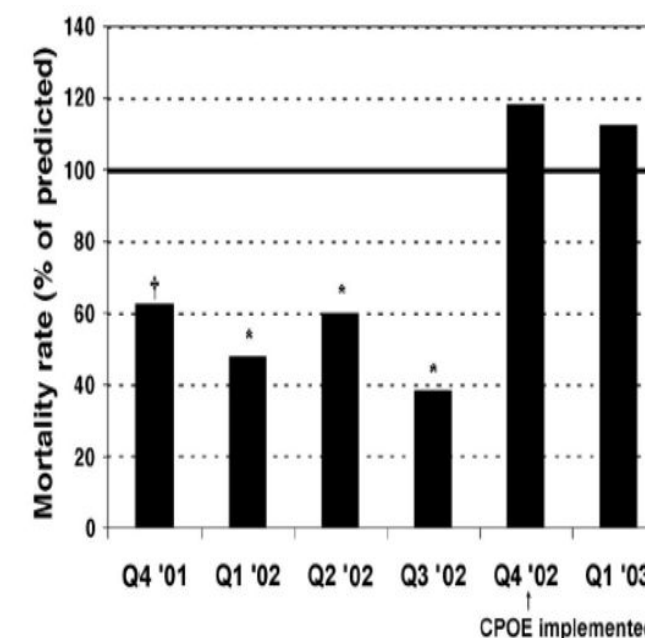
- Brigham and Women's Hospital, Boston introduced a CPOE:

	Pre	Period 1	Period 2	Period 3
Potential ADEs/1000 pt-days	15.8	31.3	59.4	0.5

Proportion increased then dropped because of the training and learning time

- After implementation, the rate of intercepted Adverse Drug Events (ADE) **doubled!**
- Reason:** The system allowed to easily order much too large dosage of potassium chloride without clear indicating that it be given in divided doses. Bates et al The impact of computerized physician order entry on medication error prevention. JAMIA 1999, 6(4), 313-21.

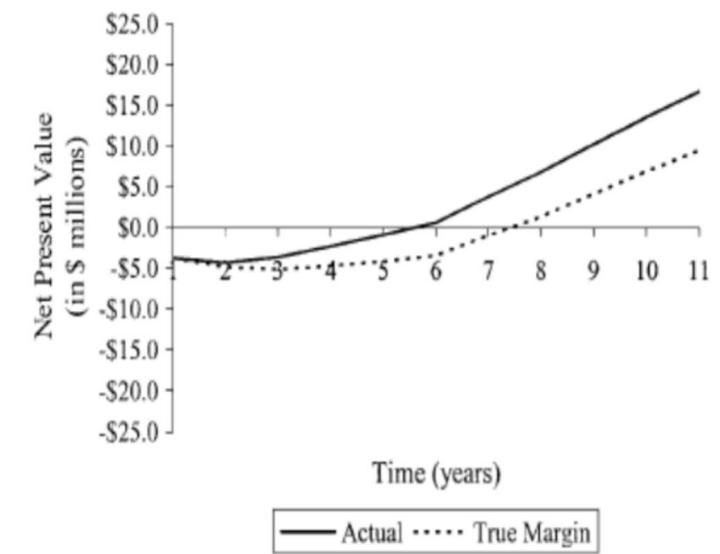
- Association with increased PICU mortality:
 - 2.8% 14 months before CPOE
 - 6.4% 5 months after CPOE
- CPOE associated errors were 19%, IT related errors were 50% and EHR errors 34%.



Examples

Examples of reduced costs

- Brigham and Women's Experience: Cost-Effective
 - \$3.7 million implementation.
 - \$600,000 to \$1.1 million operational costs.
- Results:
 - Decreased drug costs.
 - ADE cost is approximately \$4,700.
 - The return on initial investment has been \$5 to \$10 million in annual savings.
 - Full implementation of computerized physician order entry and medication related quality outcomes: a study of 3364 hospitals in 2013 showed that only 8% of US hospitals have fully implemented CPOE systems..



Challenges

- The upfront cost of implementing CPOE is one major obstacle for hospitals. At Brigham and Women's Hospital, the cost of developing and implementing CPOE was approximately \$1.9 million, with \$500,000 maintenance costs per year since.
- **Installation** of even "off the shelf" CPOE packages requires a significant amount of customization for each hospital and can be very expensive.
- **Integration** with other systems, cost, time, technical.
- **Cultural** obstacles to CPOE implementation. For example, some **physicians resist** utilizing computerized decision support tools, relying instead on practice experience.

CPOE Lessons from Other Institutions

Leadership	Commitment	Support
<ul style="list-style-type: none"> • Physicians need to lead the effort as the primary users. • However, CPOE is an interdisciplinary project that requires input and coordination with all clinical groups (nursing, PT/OT, Case Management, Pharmacy, Lab, Radiology, etc.) and I.T. 	<ul style="list-style-type: none"> • CPOE affects the workflow and process of all caregivers and ancillary departments. • Success requires commitment to change at all levels. 	<ul style="list-style-type: none"> • Responsiveness and Flexibility are key • Must be ongoing, not just at rollout. <p style="color: green; font-size: small;">Support is important especially in the first period of implementation</p>

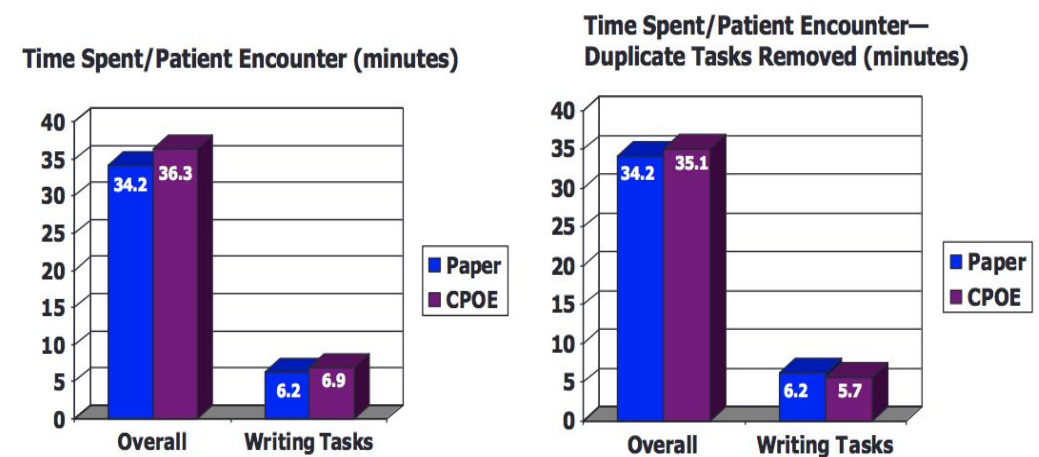
The need for CPOE

The Need for CPOE			
Improved patient safety	Improved quality	Improved efficiency	Reducing operating costs

Does CPOE take more time?

Physicians are concerned that CPOE will take too much time.

Evidence shows that CPOE adds less than one minute to the time physicians spent writing orders and overall only added **1-2 minutes** per patient encounter. As physicians gained experience with the system, the time for orders actually decreased.



The clinical benefits for improved patient care clearly outweigh the perceived concerns

What is needed for success?

- Clinicians :**
 - End-users (clinicians) must be willing to **champion** the implementation of CPOE.
 - Clinicians must be involved in design and implementation of the system.
 - Clinicians must be flexible and willing to change workflow processes.
- Information Technology (I.T. Department) :**
 - Ensure fast, reliable, and easily accessible system.
 - Provide ongoing support.
 - Train, educate users.**
- Institution :**
 - Commitment to workflow changes.**

Summary

- CPOE is a key component to improve patient safety and quality of care.
- The focus needs to be on workflow and process of care changes that are necessary for optimal patient care, not on implementing a new computer system.
- Commitment from clinicians to help with process design and implementation is critical for success.
- CPOE is a clinical based process development to improve patient care, not an IT project.

Book Summary⁴³⁸

Computerized Physician Order Entry (CPOE)

- **CPOE has the potential to reduce medication errors** through a variety of mechanisms.
- It can be easily linked to drug-drug interaction warning, is more likely to identify the prescribing physician, is able to link to adverse drug event (ADE) reporting systems, can avoid medication errors like trailing zeroes, creates data that is available for analysis, can point out treatment and drugs of choice, can reduce under and over-prescribing, and allows prescriptions to reach the pharmacy quicker.
- ✓ **Reduce Medication Errors:**
 - **Inpatient CPOE:**
 - CPOE can **decrease** serious inpatient medication errors by a relative risk reduction of 55%. However, this frequently cited article did not show reduction of potential adverse drug events (ADEs)
 - A more recent systematic review and meta-analysis suggested that **transition from paper-based ordering to commercial CPOE systems** in ICUs was associated with an **85% reduction in medication prescribing error** rates, but that there was mixed evidence that CPOE reduced ICU mortality. The study concluded "there is also a critical need to understand the nature of errors arising post-CPOE and how the addition of advanced CDSSs can be used to provide even greater benefit to delivering safe and effective patient care.
 - **Outpatient CPOE:**
 - There is more of a chance for a medication error written for outpatients, because there are far more prescriptions written in the ambulatory setting than in acute care facilities.
- ✓ **Reduce Costs**
- ✓ **Reduce Variation of Care**

Summary

CPOE	<ul style="list-style-type: none">• The process where a medical professional entering orders or instructions electronically.• CPOE is a solution to a current human system problem that focuses on achieving improved quality and safety for all patients• CPOE is viewed as an important tool to improve patient safety and quality of care delivered.• CPOE is a computer application that accepts physician orders such as : Meds, Laboratory Tests, Diagnostic Studies, Ancillary Support, Nursing Orders, Consults.
CPOE infrastructure	<ul style="list-style-type: none">• EHR• Drug information database• DSS• Other: Documentations, Medications, Test reports and lab results
IOM	<ul style="list-style-type: none">• Actions:• Endorsement of CPOE• Establish CPOE as an Institutional Commitment and Goal• Identify CPOE as a Quality and Safety
Medical Errors	<ul style="list-style-type: none">• Medication errors resulting in preventable ADEs most commonly occur at the prescribing stage• Physician drug ordering errors are most often due to one of two causes:<ol style="list-style-type: none">1. Lack of knowledge about the drug2. Incomplete patient information.
Advantages of CPOE	<ul style="list-style-type: none">• There are numerous advantages including: Improve communication, Assist with calculations, Assist with monitoring, Require key pieces of information (dose, e.g.), Make knowledge more readily accessible, Perform checks in real time, and Provide decision support.
Characters Of CPOE	<ul style="list-style-type: none">• Ordering of tests, medications, and treatments.• It involves electronic communication of the orders.• Often uses rule-based methods for checking appropriateness of care.• In addition it's helping in documentation .
The need for CPOE	<ol style="list-style-type: none">1. Increases patient safety.2. Improved quality.3. Reducing operating costs.4. Improved efficacy.

MCQs

1- Which of the following is NOT an advantage of CPOE?

- A- Improve communication
- B- Assist with calculations.
- C- Reads patient imaging.
- D- Perform checks in real time.

2- The set of databases (lab, pharmacy, radiology, clinical notes, etc.) that contains the health data & information for patients within a given institution or organization.

- A- EMR
- B- CDS
- C- CPOE
- D- CCR

3- How can CPOE reduced ADE?

- A- Duplicating therapy checking
- B- By prescribing patient medication based of the diagnosis on its own.
- C- By preventing the doctor from prescribing high risk drugs without confirmation from administration
- D- By blocking prescription of high risk drugs

4- Which of the following falls under clinical aspect of informatics?

- A- CME
- B- CPOE
- C- CDS
- D- CCR

5- Which of the following supports the need of CPOE?

- A- Increasing operating costs
- B- Reducing efficiency
- C- Reducing workload on hospital workers
- D- Increased patient safety.

6- Which of the following often uses rule-based methods for checking appropriateness of care?

- A- CME
- B- CPOE
- C- CDS
- D- CCR

Answers key

1-C 2- A 3- A 4-B 5-D 6- B

Example of Local CPOE:

Comparison between CPOE and paper prescription

Study setting: the study took place at King Khalid

University Hospital in the outpatient and inpatient pharmacies from October 2011 to April 2012.

Study subject: the target population for this study was handwritten and electronic prescriptions.

Study design: prospective study of randomized collection of prescriptions.

Assessment of legibility and completeness of handwritten and electronic prescriptions.



ORIGINAL ARTICLE Assessment of legibility and completeness of handwritten and electronic prescriptions

Ahmed I Albarrak *, Eman Abdulrahman Al Rashidi, Rwaia Kamil Fatani, Shoog Ibrahim Al Ageel, Rafiuddin Mohammed

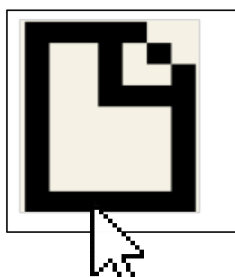
College of Medicine, King Saud University, Riyadh, Saudi Arabia

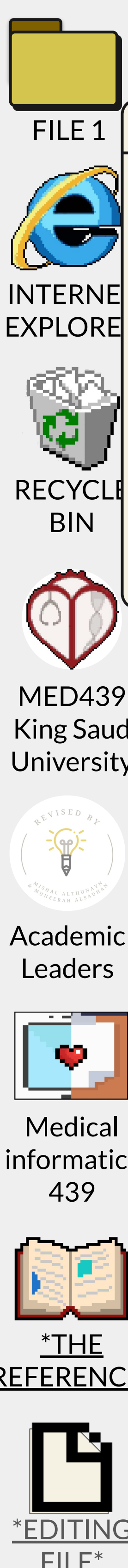
Received 6 February 2014; accepted 28 February 2014

KEYWORDS
Medication errors;
Handwritten prescription;
Electronic prescription;
Legibility

Abstract Objectives: To assess the legibility and completeness of handwritten prescriptions and compare with electronic prescription system for medication errors.
Design: Prospective study.
Setting: King Khalid University Hospital (KKUH), Riyadh, Saudi Arabia.
Subjects and methods: Handwritten prescriptions were received from clinical units of Medicine Outpatient Department (MOPD), Primary Care Clinic (PCC) and Surgery Outpatient Department (SOPD) whereas electronic prescriptions were collected from the pediatric ward. The handwritten prescription was assessed for completeness by the checklist designed according to the hospital prescription and evaluated for legibility by two pharmacists. The comparison between handwritten and electronic prescription errors was evaluated based on the validated checklist adopted from previous studies.
Main outcome measures: Legibility and completeness of prescriptions.
Results: 398 prescriptions (199 handwritten and 199 e-prescriptions) were assessed. About 71 (35.7%) of handwritten and 5 (2.5%) of electronic prescription errors were identified. A significant statistical difference ($P = 0.001$) was observed between handwritten and e-prescriptions in omitted dose and omitted route of administration category of error distribution. The rate of completeness in patient identification in handwritten prescriptions was 80.97% in MOPD, 76.36% in PCC and 85.93% in SOPD clinic units. Assessment of medication prescription completeness was 91.48% in MOPD, 88.48% in PCC, and 89.28% in SOPD.

دراسة أجراها الدكتور أحمد، موجودة بالعرض ولكن مائرحها، فننصح تلقون عليها نظرة





Medical Informatics

Lecture 1 Lecture 2 Lecture 3 **Lecture 4** Lecture 5

Lecture 6

Lecture 4

Leaders

Norah alsheikh Yasmine alqarni

Notetakers

Abdulrahman Alswat Mohamed alquhidan

Members

Alaa Alsulmi	Sarah AlQuwayz
Ghaida Alassiry	Bader Altamimi
Leena Almazyad	Sarah Almuqati
Rand AlRefaei	Rania almutiri
Shayma Alghanoum	Aljohara Alshathri
Mohammed alsayyari	Bader Alrayes
Hassan alshurafa	Rana Alshamrani
Raghad Soaeed	Abdulaziz Alderaywsh
Nasser Almutawa	Samar almohammedi

Thank you all..!<3