

# WebM&M

Morbidity and Mortality Rounds on the Web

## Spotlight

# The Lost Start Date, an Unknown Risk of E-prescribing



Agency for Healthcare Research and Quality  
Advancing Excellence in Health Care

**PSNet**  
PATIENT SAFETY NETWORK

# Source and Credits

---

- This presentation is based on the October 2019 AHRQ WebM&M Spotlight Case
  - See the full article at <https://psnet.ahrq.gov/webmm>
  - CME credit is available
- Commentary by: Adam Wright, PhD, and Gordon Schiff, MD
  - Editor, AHRQ WebM&M: Robert Wachter, MD
  - Spotlight Editor: Bradley Sharpe, MD
  - Managing Editor: Erin Hartman, MS

# Objectives

---

*At the conclusion of this educational activity, participants should be able to:*

- List the most common errors associated with computerized provider order entry (CPOE)
- Discuss standards for the transmission of electronic prescriptions to pharmacies
- Appreciate how complex medication regimens can be difficult to enter into CPOE systems
- Describe interventions that can help mitigate errors associated with CPOE systems

## Case: Lost Start Date

---

*A 71-year-old man underwent resection of a colorectal cancer. Unfortunately, his hospitalization was complicated by an acute pulmonary embolism (PE), which was treated with rivaroxaban (a new oral anticoagulant).*

## Case: Lost Start Date (2)

---

*At the time of his discharge home, the physician electronically prescribed his medications; the prescription was sent to an outpatient pharmacy. He required two prescriptions for rivaroxaban (per protocol), one for 15 mg twice a day for 10 more days, and then 20 mg daily after that. The discharging nurse reviewed the full medication list (13 medications) with the patient and his wife. The prescriptions were filled by the pharmacy.*

## Case: Lost Start Date (3)

---

*Ten days later, the patient's wife returned to the pharmacy requesting a refill of the rivaroxaban 15 mg twice a day. On re-reviewing the medications, the wife explained the patient had been taking both prescriptions at the same time (a total daily dose of 50 mg daily). This overdose had placed him at very high risk for bleeding complications. Fortunately, he did not experience any adverse events. The outpatient pharmacist worked with the physician, wife, and patient to clarify the proper dosing.*

## Case: Lost Start Date (4)

---

*The patient safety committee at the hospital performed a full review of the case. The hospitalist had appropriately entered the prescriptions in the electronic health record, including the appropriate start and stop dates for the rivaroxaban. However, when they reviewed the prescriptions in the outpatient pharmacy system, there was no start date associated with the 20 mg rivaroxaban. Further review revealed that neither the start nor stop dates were transmitted to the outpatient pharmacy.*

## Case: Lost Start Date (5)

---

*Moreover, the patient safety committee learned that transmission of start and stop date fields in electronic prescriptions is not required, and there is no national standard. The committee realized that every patient discharged from the hospital with an electronic prescription was at risk for adverse events because of this issue. They wondered what other important information was not transmitted and what individuals and institutions could do to try to prevent such adverse events.*

# Background: Electronic Prescribing

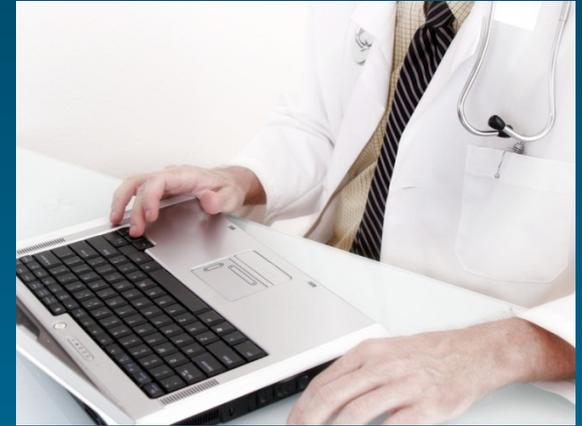
---

- Early studies of computerized provider order entry (CPOE) showed it can reduce the rate of medication errors
- Overall, CPOE has been a positive safety intervention
- However, ongoing challenges remain
  - It doesn't prevent many types of errors
  - It can introduce new errors

# Types of Errors Associated With CPOE

---

- Multiple large studies have explored how CPOE can
  - Prevent error
  - Fail to detect errors
  - Introduce new errors
- Based on these findings, the authors determined the most common and serious errors



# Most Common Errors With CPOE

---

- Inconsistencies in display of drugs, drug names, and workflow within and between systems
- Issues with ease and accuracy in finding desired drug and regimen
- Wrong-patient errors
- Issues with comments and other free-text fields in the prescription order

# Most Common Errors With CPOE (2)

---

- Clinical decision support (CDS): poor consistency, reliability, efficiency
- Interoperability/communication issues between CPOE systems and pharmacies
- Medication reconciliation issues
- Widespread failure to identify, understand, track, share, and learn from CPOE issues/errors

# Transmitting Electronic Prescriptions

---

- The National Council for Prescription Drug Programs (NCPDP), a nonprofit forum, is responsible for developing standards for electronic prescribing
- Organizations are expected to follow these standards



# Transmitting Electronic Prescriptions (2)

---

- Most electronic prescriptions are sent through the Surescripts network
  - Surescripts has built a network that connects
    - Prescribers
    - Pharmacy benefit managers
    - Pharmacies
- The Surescripts network follows the NCPDP standards, which can prevent errors like the one in this case

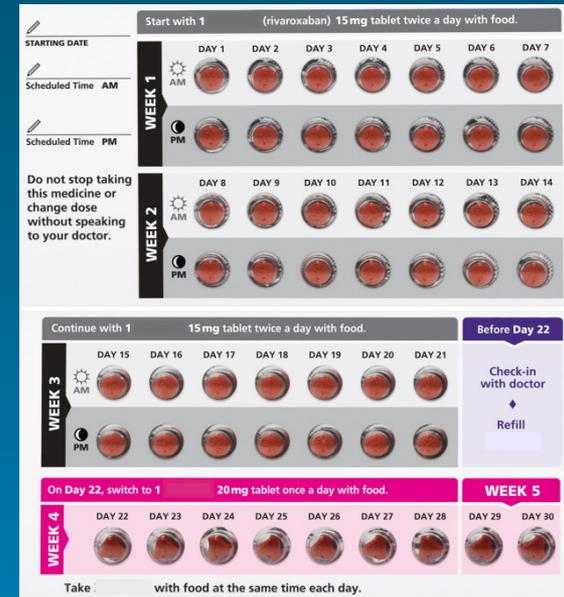
# This Case

---

- It is not clear if the pharmacy system in this case was the hospital's own internal pharmacy or an outside pharmacy
- We don't know if it used the Surescripts network
- Yet, there are many opportunities for losing information in the process

# The Prescribed Regimen in This Case

- The regimen prescribed in this case was very complex
- Entering such a regimen into a CPOE system is complex
- The drug manufacturer has recently introduced a rivaroxaban "starter pack" to simplify the prescribing



# Recommendations for Safe Prescribing

---

- Consider using indication-based ordering
  - This could have led the provider in this case (who may not have been aware of it) to use the starter pack, which would have been a good solution for this patient
- Institutions need to
  - Improve ordering capabilities for complex dosing regimens in EHRs
  - Add more "order sentences"—predefined orders for complex regimens, so providers don't have to enter them themselves

# Recommendations for Safe Prescribing (2)

---

- Improve testing of CPOE to pharmacy system linkages, including end-to-end testing where orders are written in a hospital's CPOE system, transmitted, then viewed in pharmacy information systems that the hospital or prescriber interacts with frequently



# Take-Home Points

---

- Anticoagulation, transitions from inpatient to home, and complex regimens are high-risk situations calling for extra attention and safeguards to avoid known risks and ensure patient education and error-free use of these medications. Safeguards should include both heightened situational awareness on the part of the clinicians caring the patient as well as improved systems to prevent errors.
- Improvements to computerized provider order entry systems, including indication-based ordering (that would allow tailoring orders to different clinical indications) and better testing of the integration between CPOE and pharmacy systems, are needed.

## Take-Home Points (2)

---

- For several of the newer oral anticoagulation drugs (e.g., rivaroxaban, apixaroxaban), initiating treatment for deep vein thrombosis or pulmonary embolism requires complex dosing regimens, in which the patient begins with a higher dose, followed by treatment at a lower dose. Manufacturers of these medications now market "starter packs" that appear to make this easier and less error-prone.
- Medication errors should be routinely reported and investigated, with attention to the role electronic ordering can play in both preventing future errors as well as introducing novel ones.