LEARNING FROM PRIMARY CARE EHR EXEMPLARS ABOUT HIT SAFETY

Steve Ornstein, MD
Founder, PPRNet
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BACKGROUND
EHR SAFETY

- 2009 HITECH act catalyzed wide adoption of EHRs in hospitals (>99%) and ambulatory practices (>87% of EP)
- Rapid increase in EHR use raised concerns HIT may lead to new types of errors in health care
- Potential safety risks related to technical features, users and their workflow, and the rules and regulations relevant to their use
ONC RESPONSE

- Programs to facilitate reporting and surveillance of HIT safety events
- Incorporated safety into the certification criteria for HIT products
- Developed Safety Assurance Factors for EHR Resilience (SAFER) guides to enable EHR users to evaluate and improve safety issues within their own organizations
RESEARCH NEED

- How small primary care practices with minimal resources devoted to HIT can pragmatically reduce EHR safety risks; specifically identification of pragmatic approaches to implement SAFER recommendations
1. Conduct focus group interviews with primary care clinicians from 20 small exemplar primary care practices to identify their perspectives on recommended practices from the SAFER guides, their adoption of these practices, and their impact on EHR safety.

2. Conduct key informant interviews with EHR vendor experts to reflect on the findings from the focus groups and provide additional perspectives on strategies associated with safe HIT.

3. Use qualitative transcript-based analyses to develop a taxonomy of pragmatic key strategies and best practices for safe EHR use in small primary care practices.
METHODS
CURRENT STUDY PROTOCOL

- Developed focus group script based on SAFER guides (completed March 2017)
- Identified “exemplar practices” — 18 in top tertile from October 2016 audit + 4 in top 50% thought to have useful input
- 20/21 accepted invitation to participate in April 2017 focus group; 17 participated in person, 1 by teleconference, and one by written response
- Qualitative analyses May-July 2017
12 TOPIC FROM FOUR SAFER FOCUS AREAS

- High-priority practices (3)
- Computerized physician order entry (CPOE) with CDS (5)
- Test result reporting and follow-up (2)
- Clinician communication (1)
FOUR QUESTIONS FOR EACH TOPIC

1. What is the relevance to your practice of using the recommended practices for safe HIT use?
2. Has your practice adopted the recommended practices, if so how have you realistically and practically done so?
3. What are some examples of safety issues that may have occurred prior to implementation of the recommended practices?
4. What is your perception of the impact of the recommended practice on safety in your workplace?
RESULTS
1. DATA AND APPLICATION CONFIGURATIONS ARE BACKED UP AND HARDWARE SYSTEMS ARE REDUNDANT
Agreed with importance of data backup; less so for redundant hardware.

“In 2014 our server crashed and we discovered our IT support was NOT backing up any of our scanned files such as X-rays, consult notes, hospital notes etc. 8 years’ worth of data gone!”

Agreed that data loss was uncommon and much less frequent than with paper-based records.

“We’ve been using EHRs for 24 years and have been down for only three days during that time.”
IMPLEMENTATION THEMES

- Wide variation in back-up approaches
- Agreement that expertise was necessary
- Hosted back-up solutions (VAR or otherwise) expensive but most helpful
- Wish for better guidance from their EHR vendor, a national organization, or a federal agency to vet and recommend best approaches
2. EVIDENCE BASED ORDER SETS AND CHARTING TEMPLATES ARE AVAILABLE FOR COMMON CLINICAL CONDITIONS, PROCEDURES, AND SERVICES.
RELEVANCE AND SAFETY ISSUES

• Advantages
  • avoiding omissions of care
  • standardizing care when new/less experienced clinicians or ancillary staff initiated care

• Disadvantages
  • loss of physician autonomy
  • decreased customization/personalization of care, important in patients with undifferentiated problems not always fitting a template
IMPLEMENTATION THEMES

• Significant time needed to develop and keep up to date templates/order sets
• 3 steps: Curating best practices, making changes, advising partners
• Most relevant for conditions not commonly encountered
3. CLINICAL KNOWLEDGE, RULES, AND LOGIC EMBEDDED IN THE EHR ARE REVIEWED AND ADDRESSED REGULARLY
RELEVANCE AND SAFETY ISSUES

- Up to date health maintenance reminders crucial for safe care
- Specific updates of content requires different functionality revisions, some with complex logic
IMPLEMENTATION THEMES

- Need a central person or service to embed content within EHR

“It would be nice if we had a central person who would do all of that and send it out to us”

- Alternatively, use tools external to EHR
4. THE STATUS OF ORDERS ARE TRACKED IN THE SYSTEM
RELEVANCE AND SAFETY ISSUES

- Significant human involvement needed
  “Tracking is easy, and that’s lovely but human beings still need to be involved...my nurses go through and take care of 80% of the orders”

- Order tracking features within EHRs not very familiar to practices
IMPLEMENTATION THEMES

- Patients are critical in this process, and need to be advised to follow up

  “no news is no news”
5. CODED ALLERGEN AND REACTION INFORMATION (OR NKA) ARE ENTERED AND UPDATED IN THE EHR PRIOR TO ANY ORDER ENTRY. DRUG ALLERGY INTERACTION CHECKING OCCURS DURING THE ENTRY OF NEW MEDICATION
RELEVANCE AND SAFETY ISSUES

- Agreement/major benefit of EHR
- Medication safety issues happened “all the time” before implementing the EHR

“Even with automated allergy checking, I have had a nurse practitioner prescribe Augmentin for someone with a penicillin allergy...you get the flag but you have flag fatigue and she just clicked through it. The patient developed a rash.”
IMPLEMENTATION THEMES

- Physicians and nursing staff documented and updated allergies
  - In some practices, physicians edited/deleted; in others nursing staff did so with oversight by MDs
- Clear protocols for regular gathering and review of allergies, most often done at office visits
6. DRUG CONDITION CHECKING OCCURS FOR IMPORTANT INTERACTIONS BETWEEN DRUGS AND SELECTED CONDITIONS
RELEVANCE AND SAFETY ISSUES

- Agreement that this advances patient safety, and improves care given by consultants
- Alerts are often incorrect and alert fatigue is an issue

“These have many more false positives, so I don’t act on these as commonly as I act on other alerts”
IMPLEMENTATION THEMES

- Disappointment with the number of incorrect alerts
- Participants wanted ability to edit the drug-condition alerts embedded in their EHR, a function not available in the EHRs they used

“a big hassle for a little bit of help”
7. DOSE RANGE CHECKING OCCURS BEFORE MEDICATION ORDERS ARE SUBMITTED
RELEVANCE AND SAFETY ISSUES

- High importance, but clinicians not consistently aware of the functionality in the EHR

“the main [feature] that I find valuable is the renal impairment flag, since I have indeed altered prescriptions due to [these alerts]”
IMPLEMENTATION THEMES

- Must often be invoked by prescriber, using a non-intuitive command
- Many used external tools for dosage checking
8. A PROCESS IS IN PLACE TO REVIEW INTERACTIONS SO THAT ONLY THE MOST SIGNIFICANT INTERACTION RELATED ALERTS, AS DETERMINED BY THE ORGANIZATION, ARE PRESENTED TO CLINICIANS
RELEVANCE AND SAFETY ISSUES

- Strong agreement with setting the alert level based on practice consensus

"I agree with this wholeheartedly because you do get that alert fatigue and you just ignore them"
IMPLEMENTATION THEMES

- Most practices adjusted the drug-drug interaction alert level
- Several expressed confusion about the meaning of the different setting levels, how many there were, and whether evidence-based guidelines were presented to guide the setting used.
- Many did not know this could be adjusted-which leads to ignoring alerts
9. USERS CAN ACCESS AUTHORITATIVE CLINICAL REFERENCE MATERIALS DIRECTLY FROM THE EHR, INCLUDING ORGANIZATION SPECIFIC INFORMATION WHEN AVAILABLE.
RELEVANCE AND SAFETY ISSUES

- Important to use point of care references, but disagreement these should be from within EHR
- Agreement that organization specific references should be linked within EHR (consents, DNR, prior authorization forms, medication formularies)
IMPLEMENTATION THEMES

- Accessing mobile apps made this process easier than access from the EHR

“It’s nice but this is somewhat old school”

“in practice, the UptoDate app on my phone is often faster and allows me to keep the patient chart open and in full view when accessing it.”
10. TEST NAMES, VALUES, AND INTERPRETATIONS FOR LABS ARE STORED IN THE EHR AS STRUCTURED DATA USING STANDARDIZED NOMENCLATURE. TEXT BASED TEST REPORTS (E.G., RADIOLOGY) HAVE A CODED (E.G., ABNORMAL/NORMAL AT A MINIMUM) INTERPRETATION.
RELEVANCE AND SAFETY ISSUES

- Not entirely feasible, but appreciated the concerns
IMPLEMENTATION THEMES

- Most reported routine lab results as structured data, with abnormals highlighted in color or by font
- Some clinicians codified data if received in text form (in lab tables or diagnostic codes)
11. WORKFLOWS VULNERABLE TO MISHANDLING OF TEST RESULTS, ESPECIALLY CRITICAL ONES, ARE IDENTIFIED, AND BACK UP PROCEDURES ENSURE RESULTS ARE RECEIVED BY SOMEONE RESPONSIBLE FOR THE PATIENT’S CARE
RELEVANCE AND SAFETY ISSUES

- Critical for clinical and liability concerns, yet complex to implement based upon local relationships
- HIT safety issues in this area are “too numerous to count”
IMPLEMENTATION THEMES

- Flag abnormal results, set lab interface to alert multiple staff, adapt EHR: highlight larger font
- Patient activation a critical component: instruct to call if no news
- Use EHR portals to share results, but acknowledge the problems created

“the next patient phone call that they take me out of the room for a hepatic hemangioma, I’m going to kill someone”
12. THE EHR CONTAINS A COPY OF CLINICIAN -TO- CLINICIAN COMMUNICATIONS
Agreement with concept, yet concerned that EHR templates that were sent often had too much, yet not enough data.

“Checking boxes” “unfactual” information persist.

“These template driven systems, they create a note that makes no sense”
IMPLEMENTATION THEMES

- Few developed approaches to overcome these problems
- One participant observed that his practice received reimbursement for recording information from consultants in structured fields using Medicare Chronic Care Management codes
CONCLUSIONS

- Participants agreed with most of the SAFER recommendations studied (even though none had heard of them)
- Variety of approaches used to adopt recommendations
- Considerable work/\$ required to maintain EHRs to provide safe care, but cost is worth it!