Top Ten Health IT Safety Hazards…and What to Do about Them
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Conflict of Interest

Ronni Solomon, JD, has no real or apparent conflicts of interest to report.
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Agenda

• Partnership for Health IT Patient Safety
• Top 10 Health IT Hazards
• Selected problems and solutions
• Real-world applications
Learning Objectives

• Discuss top safety events and hazards reported to the Partnership for Health IT Patient Safety

• Define ways to establish a culture of safety that prevents adverse events that may injure patients and damage organizational reputation

• Share multi-stakeholder generated safe practices for copy and paste and patient identification

• Apply principles of safety science for identifying and responding to safety problems

• Collaborate on safety solutions through Patient Safety Organizations (PSOs) and the Partnership for Health IT Patient Safety
Benefits for the Value of Health IT

• Benefits in three domains: Satisfaction, Treatment/Clinical, and Savings
• Helping to ensure that patients get the right care
• Avoid claims associated with medical errors
Let’s Start with a Quick Poll

Question 1:

Has your EHR been associated with adverse events?

a) Yes
b) No
c) Unsure
Unintended Consequences: Wrong Patient Identification

• Nurse noticed patient’s DOB was incorrect on wristband. With further investigation, discovered that patient’s admission was tied to her deceased husband’s account.

• Care summary showed history of past medical admissions that were not hers, but her deceased husband's.

• Labs were drawn, sent, and transfusion administered under erroneous account.
Partnership Goals

Making Health IT Safer Together by:

► Establishing a non-punitive environment for sharing and learning
► Testing a collaborative model for collecting and analyzing safety issues
► Achieving robust stakeholder engagement
► Sharing best practices and lessons learned
► Evaluating two reporting taxonomies
► Informing the national safety strategy for health IT
Expert Advisory Panel

- David W. Bates, MD, MSc, Brigham and Women’s Hospital
- Pascale Carayon, PhD, University of Wisconsin-Madison College of Engineering
- Tejal Gandhi, MD, MPH, National Patient Safety Foundation
- Terhilda Garrido, MPH, ELP, Kaiser Permanente
- Omar Hasan MBBS, MPH, MS, FACP, American Medical Association
- Chris Lehmann, MD, Monroe Carell Jr. Children’s Hospital at Vanderbilt University Medical Center
- Peter J. Pronovost, MD, PhD, The Johns Hopkins University School of Medicine
- Jeanie Scott, VHA Office of Informatics and Analytics/Health Informatics
- Patricia Sengstack, DNP, RN-BC, CPHIMS, Bon Secours Health System
- Hardeep Singh, MD, MPH, Michael E. DeBakey VA Medical Center
- Dean Sittig, PhD, The University of Texas Health Science Center at Houston, School of Biomedical Informatics
- Paul Tang, MD, MS, Palo Alto Medical Foundation, Sutter Health

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A Multi-Stakeholder Collaboration

DATA
- Adverse events
- Near misses
- Hazards
- Common Formats
- Vendor Summary Data
- Assessment Data
- RCAs
- Evidence-based research
- MDR, other data

ANALYTICS
- Review data
- Aggregate across multiple data sets
- Identify contributing factors and trends
- Prioritize safety opportunities
- Select issues to work on
- Develop best practices and interventions on selected issues

LEVERAGED LEARNING
- Policymakers informed of challenges and barriers
- Associations, providers and vendors adapt best practices and interventions for their constituents
- Clearinghouse for best practices
- Outreach, education, implementation and spread

HIMSS 2016

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Since HIMSS15!

- Convened Workgroup on Copy and Paste
- Issued Health IT Safe Practices: Safe Use of Copy and Paste
- Convened Workgroup on Patient Identification
- Conducted Ongoing Data Analytics
- Disseminated Monthly case studies
- Held Annual Meeting: Partnering for Action

https://www.ecri.org/resource-center/Pages/HITPartnership.aspx
### Partnership Activities: Meetings

#### Quarterly Conference Calls
- April 7, 2014; July 24, 2014; January 20, 2015, May 19, 2015
- July 28, 2015, January 2016

#### In Person Meetings
- September 23, 2014
- October 16, 2015
- 2016 TBD

#### Workgroup Meetings
- Copy and Paste monthly meetings started 2/2015
- Patient Identification monthly meetings started 11/2015
Partnership Activities

- Design guiding principles
- Hold face-to-face meeting; publish proceedings
- Convene workgroup on copy and paste
- Prioritize; Disseminate
- Recruit stakeholders
- Obtain funding
- Conduct evidence scan; analyze data
- Convene workgroup on patient identification
- Establish expert advisory panel
- Analyze and disseminate data
- Develop safe practices; develop toolkit
- Disseminate safe practices, lessons learned
- Implement web based reporting system
- Convene quarterly conference calls
- Seek endorsement for safe practices
- Hold 2d Face to Face
- Engage, Exchange, Analyze, Prioritize, Disseminate
Top 10 Health IT Hazards

1. Indiscriminate use of copy and paste
2. Patient misidentification
3. Errors in weight-based drug dosing
4. Poor data integrity
5. Handling of allergy data
6. Poor usability: leading contributing factor among HIT reports
7. Missing safeguards: leading factor in CDS events
8. Mismatched configuration & workflow
9. Mishandling of timed medication orders: duplicates & omissions
10. Truncation of information on display
Copy/Paste
How can copy/paste lead to patient safety risks?

- 77 year old woman w/remote history of pulmonary embolus, admitted for diarrhea/dehydration after chemotherapy

Admission plan specified heparin for venous thromboembolism prophylaxis, but heparin never ordered

Transferred to another service, plan copy/pasted for 4 days; heparin never administered

2 days after discharge, patient re-hospitalized with pulmonary embolism

https://psnet.ahrq.gov/webmm/case/157
Risks and Benefits of Copy and Paste

Patient Safety Risks

- “Note bloat”
- Compromised data integrity
- Challenging for EHR users to identify relevant clinical information
- Impaired effective communication
- Potential diagnostic bias
- Regulatory concerns

Benefits

- Time saving
- Efficient capture of complicated data
- Improved tracking of multiple problems on highly complex patients
- Continuity of medical decision-making
- Completeness of encounter documentation
- Reduced transcription error
Systematic review of all literature from Jan 2010 to Jan 2015, bibliographies reviewed to identify articles published prior to 2010

Full report available at: https://www.ecri.org/resource-center/Pages/HITPartnership.aspx
Evidence Review: How often does copy/paste occur?

Self Reported Use

- 66% of Northwestern medical students copied their own notes frequently or nearly always (Heiman et al. 2014)
- 90% of physicians use to write daily inpatient notes; 78% use always or most of the time (O’Donnell et al. 2008)
- 81% of copy/paste users frequently copy notes from other physicians or prior admissions (O’Donnell et al. 2008)

Chart Based Studies

- 10.8% of outpatient primary care, cardiology and endocrinology notes contained copy/pasted material (Edwards et al. 2014)
- Roughly 5% of diet, exercise and weight loss counseling statements were copied from prior notes by the same author (Turchin et al. 2011)
Evidence Review: Does copy/paste cause adverse patient events?

• Review of 212,165 office visits over 1 year
  – Revealed 190 diagnostic errors resulting in unplanned urgent care within 2 weeks
  – In patient documentation around these errors, 7.4% of notes contained copy/pasting and in ~36% of these copy/pasted notes, copy/paste mistakes contributed to the diagnostic error

Evidence Review: Consequences of inappropriate copy/pasting for the EHR

- Note bloat
- Internal inconsistencies
- Propagation of errors
- Erroneous copying between patient charts

Decreased Time for Clinical Synthesis
Evidence Review: Author Responsibilities

- Accuracy
- Source attribution
- Author Responsibilities
- Brevity

Use copy/paste only in appropriate contexts
Polling Question #2

Does your org have a policy on copy/paste in the EHR?

a) Yes
b) No
c) Unsure
d) Don’t have an EHR
Evidence Review: Organizational Responsibilities

- Only 24% of hospitals have a copy/paste policy in place
  - 2013 Office of the Inspector General
## Proposed EHR Modifications

<table>
<thead>
<tr>
<th>Suggestions from Literature</th>
<th>Potential Benefits</th>
</tr>
</thead>
</table>
| Alter display of copied material                                                             | • Allows easy identification of copied material  
• Could facilitate author attribution                                                        |
| Create linkages between references text and referring note                                   | • Decreases *en bloc* copying of referenced material  
• Could decrease note bloat                                                                 |
| Allow portions of note to be hidden with toggle function                                      | • Allows note to remain a complete repository of information, while allowing users to customize display |
| Display relatively stable sections of note separately from parts requiring frequent updating | • For instance, problem list vs. HPI  
• Potential to eliminate redundant documentation of stable parts of the note                  |
# Proposed EHR Modifications

## Suggestions from Literature

<table>
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</tr>
</thead>
</table>
| Allow editing of chart by multiple authors | • Potential for increased accuracy if each topic expert owns responsibility for documentation in their area  
• Promotes team based approach |
| Creation of audit capacity | • Allows identification of “high utilizers”  
• Supports organizational oversight of copy/paste use and consequences |
Safe Practice Recommendations for Copy and Paste

• Provide a mechanism to make copy and paste material easily identifiable
• Ensure that the provenance of copy and paste material is readily available
• Ensure adequate staff training and education regarding the appropriate and safe use of copy and paste
• Ensure that copy and paste practices are regularly monitored, measured, and assessed

Safe Practices
Evidence Review
Tools
Resources

- Educational Handouts
- Checklists
- Policy Development Tool
- Audit Tracking Tool

https://www.ecri.org/resource-center/Pages/HITPartnership.aspx
Second Work Group & Deep Dive

• Process of correctly matching a patient to appropriately intended interventions and communicating information about the patient’s identity accurately and reliably throughout the continuum of care

• Scope focuses on breakdowns or gaps in that process

• Definition adapted from Australian Commission on Safety and Quality in Healthcare
Methods

- Keyword search* of PSO database identified potential events
  - \((n = 10,915)\)

- Manual review of events for verification of patient identification issues
  - \((n = 7,613)\)

- Event dates: January 2013 through August 2015

- Classified utilizing patient identification taxonomy by patient safety analysts

*Keywords: same name, last name, first name, patient name, pt name, pt. name, patient’s name, pts’ name, no name, name corrected, else’s name, elses name, exact name, name band, wrong patient, wrong pt, to another patient, to another pt, incorrect patient, incorrect pt, one patient, one pt, patients identification, patient’s id, patient sticker, pt sticker, patient label, pt label, wrong person, identification band, Identification bracelet, patients id, identity, identifier, identifying patient, identifying pt, ID band, ID bracelet, ID number, date of birth, DOB, social security, SSN, incorrect mr, wrong mr, wrong paperwork, wrong paper work, wrong medical, arm band, armband
Patient Identification Process Map
Percentage of issues during the phases of care

Registration, Scheduling

Intake

Diagnostics
Labs
Pathology
Imaging

Encounter

Diagnostics
Labs
Pathology
Imaging

Treatment
Meds
Procedures
Transfusion

Post-Encounter

HIE
eRx
Referrals/Consults
Patient portals

Technology

Visit completion, discharge, transport, transition

0.2%

12.6%

87.2%
Solutions: Duplicate Records

- Probabilistic matching algorithms
- Standardizing attributes and data formats
- Quality assurance on registration data
- Unique patient identifier (UPI)
- Patient photographs and other biometrics
Technology Commonly Reported in Patient Identification Issues

Events involving technology

- POC Testing
- Barcoding
- CPOE/EMR
- Interfaced systems
- Monitors
- HIE
- ePrescribing
- Smart pumps
- RFID
- Patient Portals

Physical Identification

15%
Patient Identification During Encounters

36.5%  
22.1%

- **Diagnostics**
  - Labs
  - Pathology
  - Imaging

- **Treatment**
  - Meds
  - Procedures
  - Transfusion

**Visit completion, discharge, transport, transition**

- Monitoring
- Documentation
- Physical Identification

**Encounter**
Patient Identification Processes
Where Breakdowns Frequently Occur

- Ordered: 40%
- Performed: 39%
- Results: 21%
Solutions: Orders on Wrong Patient

- Patient photographs
- Standardized display of identifiers
- Limit number of concurrent records open
- Indication-based orders
- Use of user credentials or RFID to constrain choices
- Unique naming conventions for newborns

SMITH, Walter Joseph III
Nov 9, 1961 (53 yo M)
MRN1348887

Errors in weight-based dosing

- Not new or endemic to EHRs
- Multifactorial causation:
  - Equipment: scales unavailable or non-metric
  - Culture: Use of estimated weights routine
  - Technology: Lack of safeguards against errors
  - People: Poor at guessing weights, inconsistent documentation
  - Communication/Workflow: Current weight not available to pharmacist
Involves many high-alert meds

Top Drugs Involved in Wrong-Weight Medication Errors (n=304)

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heparin sodium*</td>
<td>110</td>
</tr>
<tr>
<td>Enoxaparin (Lovenox®)*</td>
<td>84</td>
</tr>
<tr>
<td>Acetaminophen (Tylenol®)</td>
<td>20</td>
</tr>
<tr>
<td>Dobutamine*</td>
<td>17</td>
</tr>
<tr>
<td>Dopamine*</td>
<td>17</td>
</tr>
<tr>
<td>Gentamicin sulfate</td>
<td>17</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>14</td>
</tr>
<tr>
<td>Ibuprofen (Motrin®)</td>
<td>9</td>
</tr>
<tr>
<td>Nesiritide (Natrecor®)</td>
<td>8</td>
</tr>
<tr>
<td>Propofol (Diprivan®)*</td>
<td>8</td>
</tr>
</tbody>
</table>

* High-alert medications

PA Patient Safety Authority.
How EHR may contribute

- Prompts to enter or update weights
- Validation of entered values:
  - Anthropometric measures
  - Delta checks
- Optimizing data capture and display
- Import measurements directly from devices, with manual override
- Showing dates with measurements
- Do not let weight “copy forward”
- Most reliable/current source for pharmacy
Other recommendations

• Clear standards:
  • Timeliness of obtaining weights
  • Frequency of updates
  • Use of estimates, self-reported weights
• Transition to metric-only scales
• Eliminate pounds-only scales
• Lock dual scales in metric mode

Polling Question #3

Which problem is most significant for your organization?

a) Weight-based dosing
b) Copy & paste
c) Patient identification
d) None of these
6 Things You Can Do Next Week

Application to the Practice Setting
#1 – Determine if your organization has a health IT safety program

- How is it resourced?
- Is there an FTE allocated to health IT safety work?
- Is the health IT safety work incorporated into your organization’s overall patient safety program?
- Is there a strong collaboration between nursing/clinical informatics, quality improvement, patient safety and risk management?
- Are you addressing the effectiveness of your incident reporting system?
#2 – Bring a multi-disciplinary team together to review the SAFER guides
https://www.healthit.gov/safer/safer-guides

- Start with the High Priority Practices and Organizational Responsibilities guides
- Recommend off-site for a day
- Assign follow-up
#3 - Review your organization’s copy/paste policy

- Do you even have one?

- This may be your chance to develop a policy using ECRI’s recommendations:
  - Provide a mechanism to make copy and paste material easily identifiable
  - Ensure that the provenance of copy and paste material is readily available
  - Ensure adequate staff training and education regarding the appropriate and safe use of copy and paste
  - Ensure that copy and paste practices are regularly monitored, measured, and assessed
  - Contact your EHR vendor for help
#4 – Give your end users the best chance of selecting the right patient

- Allow only one patient record to display at a time
- Do not put patient list in alphabetical order
- Use alternating line colors for better visualization
- Add the patient’s picture
- Put picture or patient name on all ordering screens and order submit button
- Do not use default setting to select patient
- Carefully monitor any test patients in production. Use names that clearly indicate test patients in production (use numbers or multiple ZZ’s)
#5 – Provide an alert for weights that appear inaccurate – upon value entry

- The problem we saw - wrong weight entered by nurse into EHR
  - Put temperature in weight field
  - Put systolic blood pressure in weight field
  - Put decimal in wrong place
  - Used lbs instead of kgs
- The Solution - Alert nurse when weight entered is 10% higher or lower than previous value
#6 – Embed a nurse driven protocol into the EHR to reduce catheter associated urinary tract infections

- Use the EHR to reduce hospital acquired conditions – CAUTI
- On order entry, have provider indicate that the catheter removal protocol should be followed. Or if not, why not?
- Use clinical decision support to alert nurse at 24 hour intervals to assess continued need for catheter.
- Provide links in the alerts that take the provider right to the discontinuation order, and right to the flowsheet documentation for the nurse
- We’ve seen a reduction in CAUTIs from 2.4 to 0.5 infection rate (infection rate/1000 catheter days)
Benefits for the Value of Health IT

• Benefits in three domains: Satisfaction, Treatment/Clinical, and Savings

• Helping to ensure that patients get the right care

• Avoid claims associated with medical errors
Questions and Contact Info

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