Technology Workarounds and Patient Safety

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Aims

This study focuses on identifying technology workarounds that have the potential to compromise patient safety.

• Consider characteristics of a safety culture

• Recognize the importance of cognitive informatics principles
  ▪ influence human factors engineering and technology usability

• Examine case reports

• Propose strategies for assessing the characteristics of technology workflow disruptions and for preventing technology workarounds.
Background

• Healthcare technologies are designed to improve the work of managing and delivering healthcare

• Many technologies are focused on ensuring patient safety

• New technologies and safety strategies may disrupt the typical workflow of clinicians

• To meet workload demands, clinicians may use a technology workaround that has the potential to compromise patient safety
Definitions

• Safety Culture
  ▪ Just Culture: System or process issues are identified and addressed
  ▪ Strategies for developing a safety culture
    • Human factors engineering
    • Systems engineering
    • Root cause analysis or failure modes and effect analysis

• Workarounds: deviations from accepted and expected practice protocols

  “Shortly after beginning my career as a new nurse on a med/surg unit, I can still distinctly remember thinking that I can take everything I learned from nursing school and throw it out the window. Looking back after learning about workarounds, I feel almost my entire orientation was based around teaching me how to workaround everything.”
Methods

• Qualitative data collection and analysis
  ▪ RN student (BS and DNP discussion forums)

• Data Collection Prompts
  ▪ Identify a technology workaround that you have personally used or have observed someone else using in a clinical setting
  ▪ Reflect on how the workaround may compromise patient safety
  ▪ Think about the human-technology interface, the technology design, and cognitive informatics and discuss the characteristics of the technology that led to the workaround

• Examine reported cases of technology workarounds (N=26)
Results

- Technology workarounds related to medication administration (N=18)
  - bypassing second clinician verifications for high-hazard medications (N=7)
  - patient ID scanning workarounds (N=6)
  - bypassing smart pump technologies (N=5)
- Inappropriate use of EHR functions for documentation (N=4)
- Medication dispensing system accessibility (N=1)

- Technology malfunction (N=1)
- Audit and tracking of call-center response times (N=1)
- Special circumstances ER(N=1), neonates (smart pump), anesthesia (smart pump)
CASE ILLUSTRATION:

Second Clinician Verification

High-hazard medications require a second clinician to verify the order, dose, route of administration, and patient and then sign-off on the EHR.

- Workaround types
  - Sharing ID badges
  - Sharing passcodes
  - Completing verification somewhere other than patient room

- Reasons given for workaround
  - Difficulty finding another nurse
  - Short staffing
  - Confidence in competency to practice

- Solve the problem by going to biometric verification (fingerprint)
CASE ILLUSTRATION:

Patient ID Scanning

• Electronic medication administration systems (eMAR) require scanning of patient ID band as part of the medication administration process
  ▪ Medication administration populates to the EHR
• EHR function allows printing of additional ID bands
  ▪ Duplicate bands are scanned rather than ID band on the patient
• Reasons for workaround:
  ▪ Too few scanners or malfunctioning scanners
  ▪ Bar code printer generates unreadable labels
  ▪ Bar codes unreadable on patient bands (small wrists)
  ▪ Less disturbing to patient during sleep
  ▪ System allows ID number to be typed in rather than scanned
Bypassing Smart Pump Safety Technology

• Smart pump technology promotes safe administration of IV infusions
  - Software ‘guardrails’ for therapeutic dosing (high/low limits and soft/hard warnings)
  - Guardrails will signal a provider that a proposed medication administration is dangerously high or therapeutically low.

• Reasons for bypassing technology
  - Too many steps involved in programming
  - Incorrect or inconsistent minimum infusion times in drug library
  - Drug libraries did not support use in neonates, anesthesia, certain antibiotics
  - Air-in-line sensors are too sensitive causing multiple alarms
Limits

• Case report sample size is small (N=26)
• Cases are limited to US
• Qualitative methodology does not capture the extent of the issue
Bottom Line

• Technology workarounds compromise patient safety

• Technology designers must consider usability and clinical workflow
  ▪ Design for ease-of-use and intuitive use (seek input by end users)
  ▪ Reprogram and or update drug libraries

• We must promote a culture where healthcare professionals commit to using the technology in the way that it was designed.
  ▪ Identify system weaknesses and barriers
  ▪ Measure/monitor compliance
  ▪ Educate staff

• Organizational culture must embrace the ideas, opinions and strategies proposed by end users to improve the human technology interface.
References
