

Healthcare Delivery System Perspective

The Role of Standards in Preventing & Mitigating Health IT Patient Safety Risks
NIST Workshop

Jeanie Scott, MS, CPHIMS

Director, Informatics Patient Safety

Veterans Health Administration/Office of Informatics & Information Governance

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Health Information Technology (IT) Safety Plan

- Developing safe health IT
 - Including technology that is designed, tested, implemented, and used continuously in safest manner
- Using health IT safely
 - Developing systems to detect close calls, near misses, and identify health (IT) as a contributing factor
 - Implementing and monitoring use of health IT – manual and automated surveillance systems
 - Collaborating between IT, patient safety, and informatics communities
- Using Health IT to improve safer care
 - Creating and adopting technology to address patient safety issues
 - Ensuring manual and Automated surveillance

VA's Health IT Safety Program

- Developed with a focus on helping VA provide safe, effective, and quality health care
 - Ensuring information systems provide the right information, to the right users, at the right time, and in the right way, to minimize the possibility of an adverse patient safety issue
- Identification and remediation of health IT safety risks
 - Reporting and analyzing close calls
- Strategies for safety-enhanced product lifecycles
 - Analyzing the Software Development Lifecycle
 - Testing processes
 - Developing deployment strategies
 - Using implementation best practices
- A learning environment through education and advocacy

Then...

- Veterans Health Information Systems and Technology Architecture (VistA)
- An integrated suite of Health Information Technology Systems used across care settings including:
 - Electronic Health Record (EHR)
 - Imaging
 - Medication Administration
 - Personal Health Records
 - Data Sharing with and beyond the Veterans Health Administration (VHA)
 - Much more – 104 “packages” total



**Department of Veterans Affairs
Office of Inspector General**

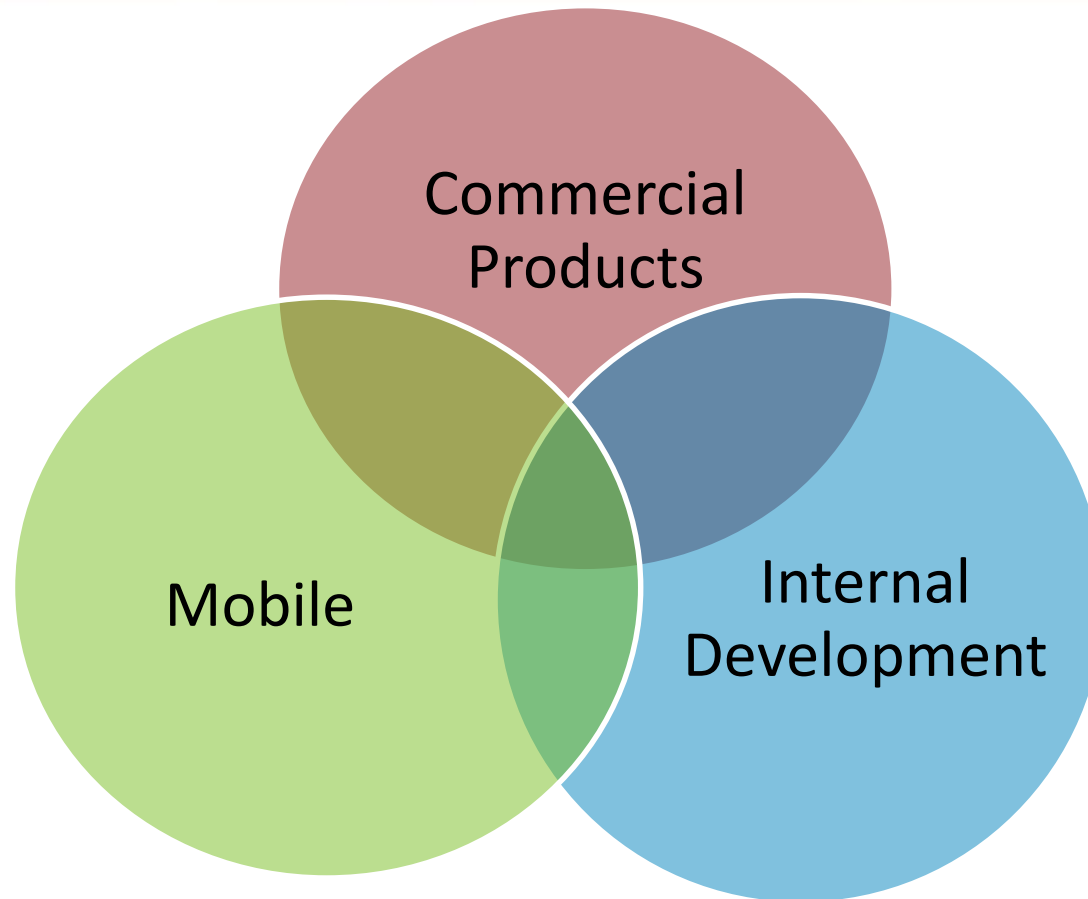
**Review of Defects in VA's
Computerized Patient Record System
Version 27 and Associated
Quality of Care Issues**

Report No. 09-01033-155

VA Office of Inspector General
Washington, DC 20420

June 29, 2009

Now...



Health IT Investment

- VA has adopted health IT more widely than other U.S. health care providers
- VA spends larger proportion of budget on health IT than other U.S. health care providers
- At VA, improved performance measures in areas of preventive care and treatment of chronic conditions coincide with adoption of IT tools related to treatment
 - Health IT eliminated duplicated tests and reduced medical errors, accounting for 86% savings
 - VA invested \$4 billion in health IT and saved more than \$7 billion from 1997 to 2007

Study authors: The Center for IT Leadership

**Health Affairs, 29, no. 4 (2010):629-638*

<http://content.healthaffairs.org/cgi/content/full/29/4/629#SEC2>

What is Safety?

- The National Patient Safety Foundation defines patient safety as the avoidance, prevention and amelioration of adverse outcomes or injuries stemming from the processes of health care
- Safety is more than just the absence of errors, including:
 - An outlook that recognizes that health care is complex and risky and that solutions are found in the broader systems context
 - A set of processes that identify, evaluate, and minimize hazards and are continuously improving
 - An outcome that is manifested by fewer medical errors and minimized risk or hazard

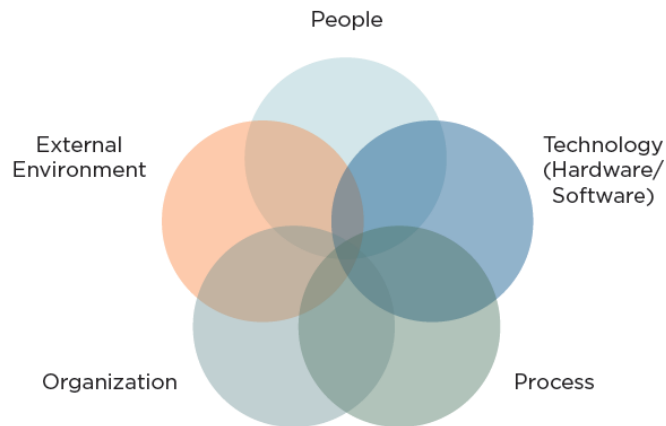
Source: Institute of Medicine 2000
To Err is Human: Building a Safer Health System

Safer Health Care with Health IT

- Computerized Provider Order Entry (CPOE) is a powerful method for preventing medication errors due to misinterpretation of hand-written orders
- Direct order entry reduces errors at all stages of the medication process, not just in prescribing, and has been recommended by the National Patient Safety Partnership
- Automated alerts (Order Checks) may increase clinician recognition of potentially adverse interaction
- 24x7 access to patient information including progress notes, diagnostic test results, consultations, diagnosis and specific patient warnings
- Early detection of safety indicators using data analysis and natural language processing

Social Technical System

- The sociotechnical perspective takes the approach that the system is more than just the technology delivered to the user. The overall system—the sociotechnical system—consists of many components whose interaction with each other produces or accounts for the system’s behavior (Fox, 1995).



- Technology
- People
- Process
- Organization

Source: 2012 Institute of Medicine report
Health IT and Patient Safety: Building Safer Systems for Better
Care

Working as Designed: Myth or Fact?

- The Human Side of Safety
 - Alert fatigue results from non-specific pop-ups that are either ignored or disabled
 - Usability is a trade off of Ease of Use balanced with design to prevent Use Error
 - Data is often used with different information models (i.e. Physician, Nurse, Pharmacist, Laboratory Tech, Patient, Quality Measures)
- Technology Side of Safety
 - Systems needs to be available 24x7 and requires regular maintenance, including upgrades for sustainment
 - Latency of data transactions can lead to incorrect data storage or duplicate transactions
 - Implementation and deployment strategies must account for business workflow and change management processes

[redacted] Consult/Procedure orders for patients may have been rejected and potentially overlooked

[redacted]
software can lead to medication errors

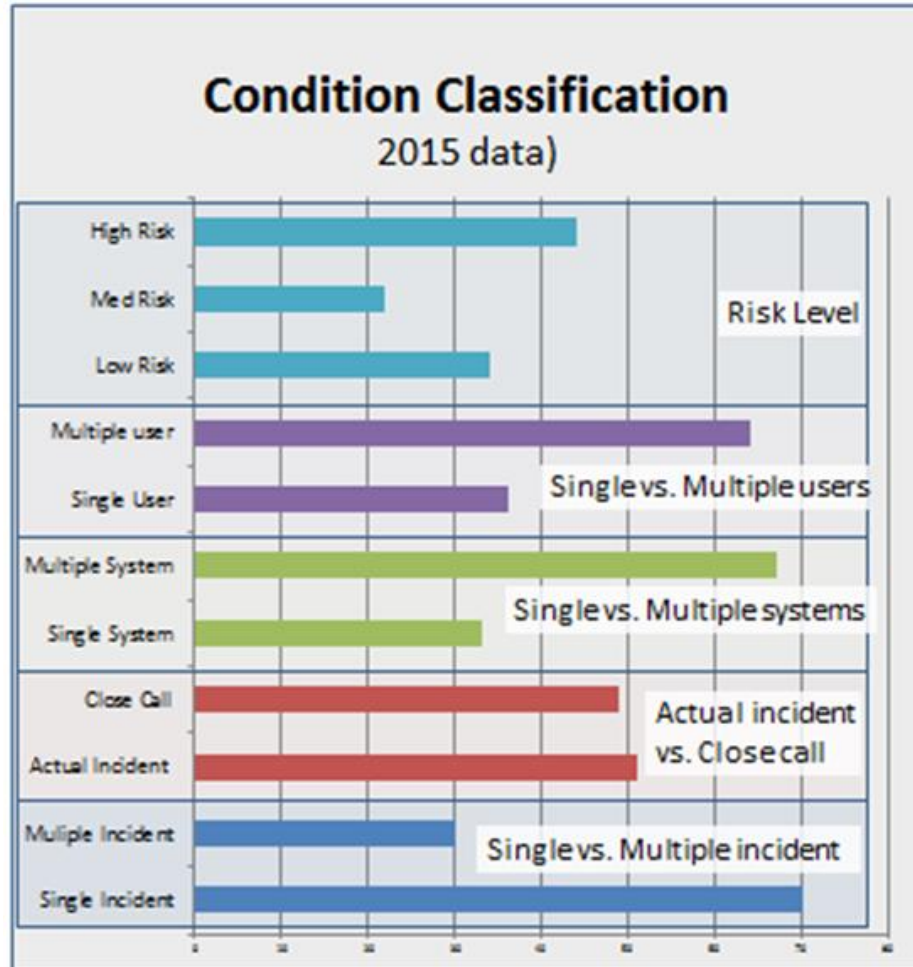
NPO (nothing by mouth) Diet Orders may automatically revert to previous diet orders in [redacted]

Order Check National Term File Mapping in [redacted]

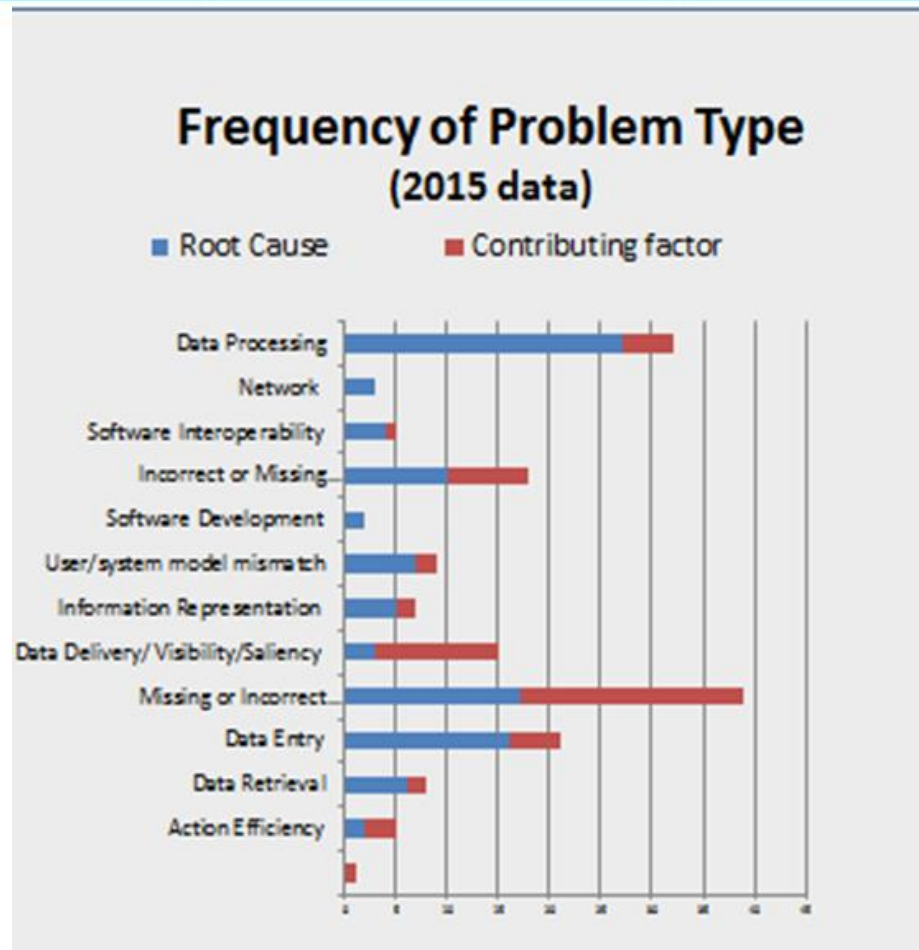
Issues identified with Identity Management in [redacted]
[redacted] systems
in use at [redacted]

[redacted]: Inability to enter Unit Dose orders beyond midnight for patients checked in before midnight.

Health IT Safety Associated Conditions



Where are Problems Reported?



An analysis of electronic health record-related patient safety concerns

Derek W Meeks,^{1,2} Michael W Smith,^{1,3} Lesley Taylor,⁴ Dean F Sittig,⁵ Jean M Scott,⁴ Hardeep Singh^{1,3}

Table 1 EHR-related safety concerns categorized by sociotechnical dimensions and phases of EHR implementation and use

Sociotechnical dimension	Phase 1 (n=74)	Phase 2 (n=25)	Phase 3 (n=1)	Total
<i>Hardware and software:</i> the computing infrastructure used to power, support, and operate clinical applications and devices	67	9	0	76
<i>Clinical content:</i> the text, numeric data, and images that constitute the 'language' of clinical applications	22	15	1	38
<i>Human-computer interface:</i> all aspects of technology that users can see, touch, or hear as they interact with it	16	12	1	29
<i>People:</i> everyone who interacts in some way with technology, including developers, users, IT personnel, and informaticians	5	15	0	20
<i>Workflow and communication:</i> processes to ensure that patient care is carried out effectively	24	11	0	35
<i>Internal organizational features:</i> policies, procedures, work environment, and culture	4	2	0	6
<i>External rules and regulations:</i> federal or state rules that facilitate or constrain preceding dimensions	1	1	0	2
<i>System measurement and monitoring:</i> processes to evaluate both intended and unintended consequences of health IT implementation and use	1	0	0	1

Phase 1, unsafe technology or technology failures; phase 2, unsafe or inappropriate use of technology; phase 3, lack of monitoring of safety concerns. EHR, electronic health record; IT, information technology.

Pro-Active Health IT Safety Approaches

- Design
 - User Experience
 - Content
 - Workflow
 - Software
- Monitoring Systems
 - Automated : Past, Challenge, Predictive
 - Manual : Challenge, Voluntary Reporting

Collaborations

- VA's National Center for Patient Safety (NCPS)
 - Partnership with VA's National Center for Patient Safety to resolve patient safety issues that involve health IT systems
- Health & Human Services Office of the National Coordinator
 - Health IT Safety Collaborators/Collaborative Workgroup on Usability/Medication Management
- Association for the Advancement of Medical Instrumentation (AAMI)
 - AAMI Health IT Committee
 - HIT/WG 01 - HIT Risk Management
 - HIT/WG 02 - HIT Quality Systems
- Internal & External IT Developers

Conclusion

- Health IT is integral to the delivery of health care quality, value, and safety
- Safer care requires a planned approach to prevent unintended consequences



“An ounce of prevention is worth a pound of cure.”

– Benjamin Franklin

For More information

Contact:

Jeanie Scott, jeannie.scott@va.gov