HOW SAFE IS HEALTH TECHNOLOGY ?

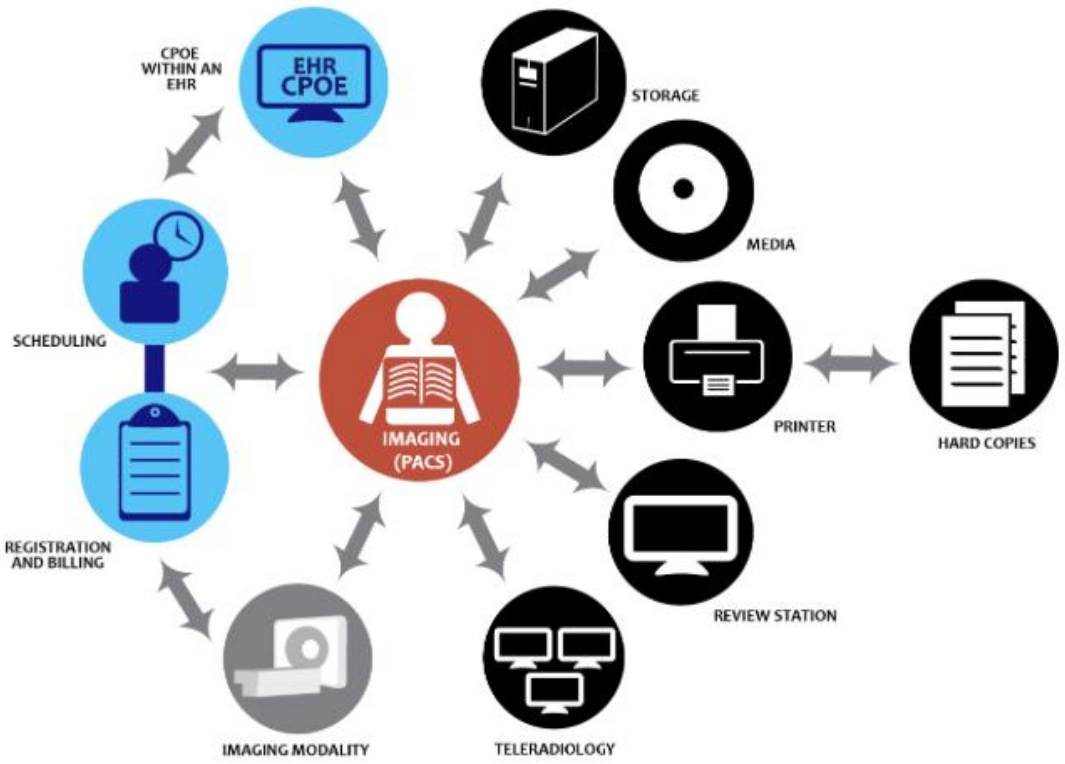
ROLA HAMMOUD, MD, MHA, FACHE

Learning Objectives

1. Identify health technology added value for patient safety
2. Recognise the failures that might occur with technology
3. Anticipate safety issues and technology risks and mitigate those


BOTCHED OPERATION
Death By 1,000 Clicks: Where Electronic Health Records Went Wrong
The U.S. government claimed that turning American medical charts into electronic records would make health care better, safer and cheaper. Ten years and $36 billion later, the system is an unholy mess. Inside a digital revolution that took a bad turn.
By Fred Schulte and Erika Fry, Fortune • MARCH 18, 2019
(The Voorhes for Fortune)

A true story



HEALTH IT

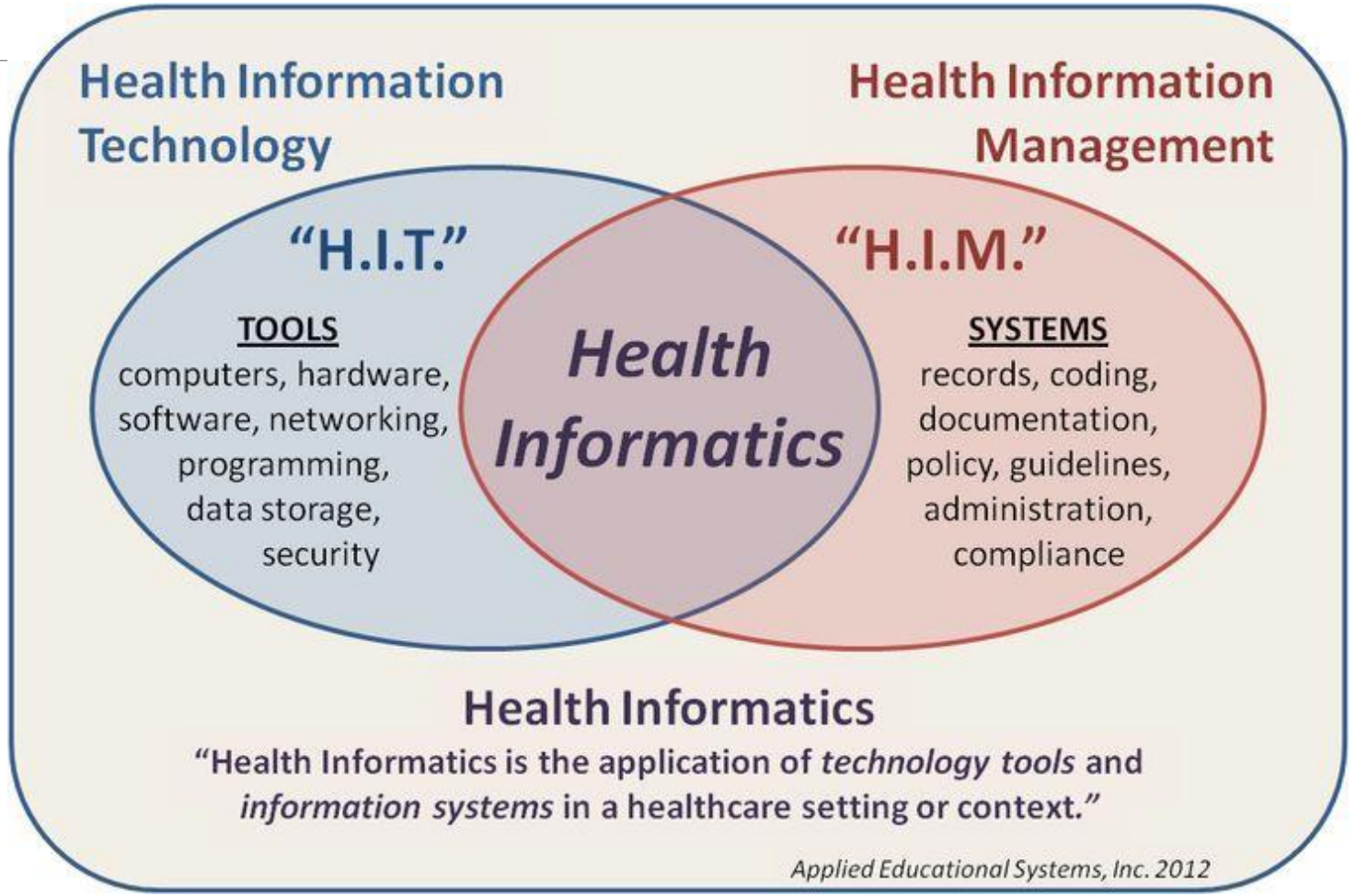
- Administrative
- Automated dispensing systems
- Computerized medical devices (pumps, monitors)
- Electronic health records
- Human interface device
- Laboratory Information System (Microbiology, pathology)
- Radiology/ Diagnostic imaging system
- Implants: prosthesis and pacemakers
- Advanced surgical applications: Robotics

Components

Hardware & Software

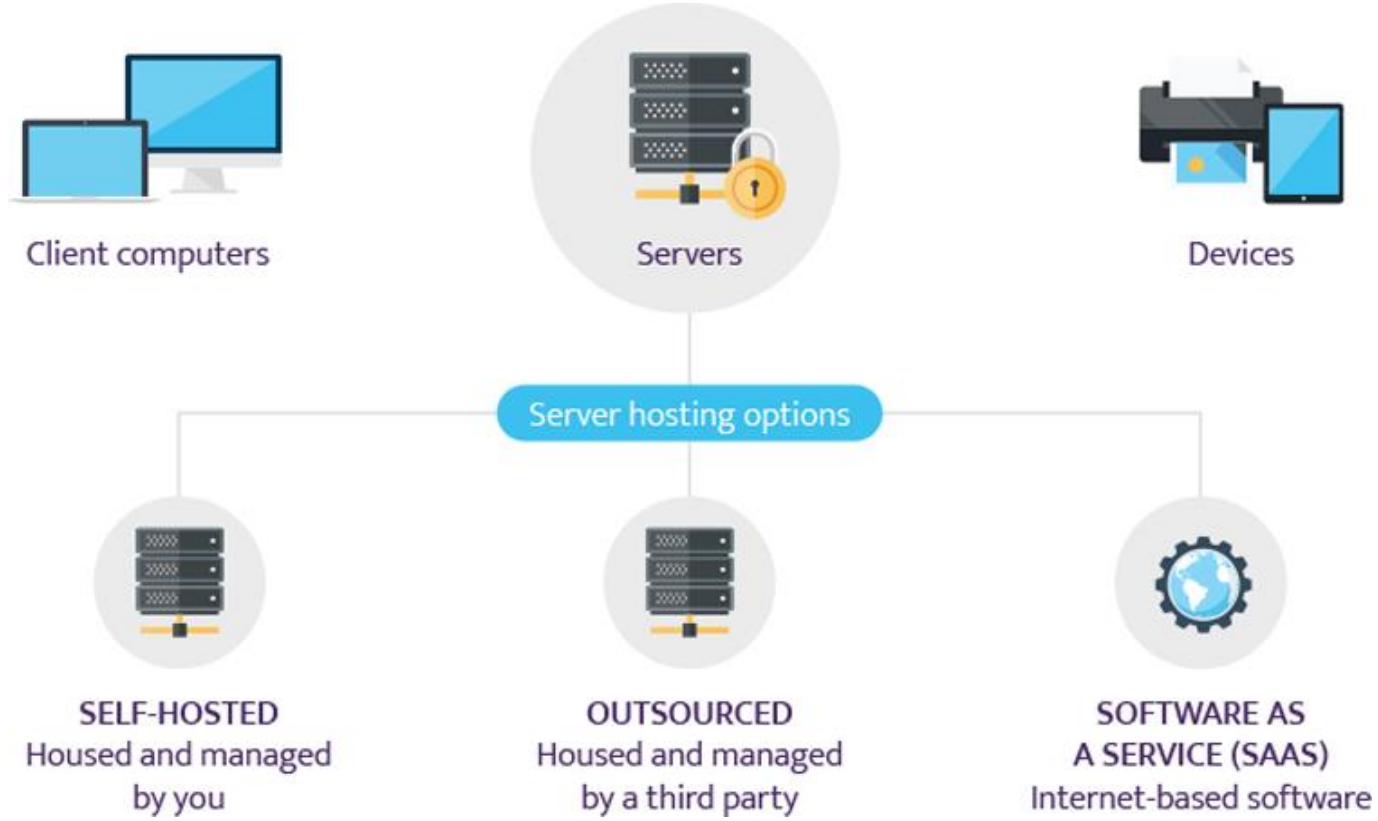
- Create
- Maintain
- Analyse
- Store
- Receive information

to help in the diagnosis and treatment of diseases.



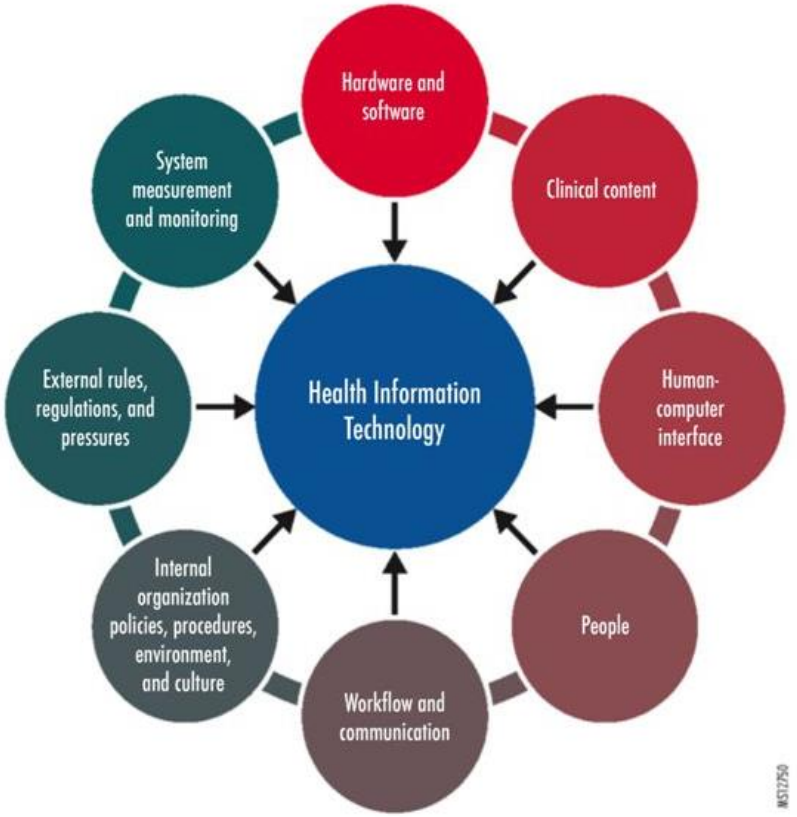
Characteristics of Safe Health technology

- Optimally designed by developer
- Thoughtfully implemented by the organization
- Appropriately used by the organization's staff



A socio-technical model to evaluate Health IT

- The technology operates in a very complex environment.
- The socio technical model was developed to evaluate health IT within the context of **8 dimensions**
- Examine health IT reported events
- Understand human system interactions when gaps are identified in the IT system in order to improve

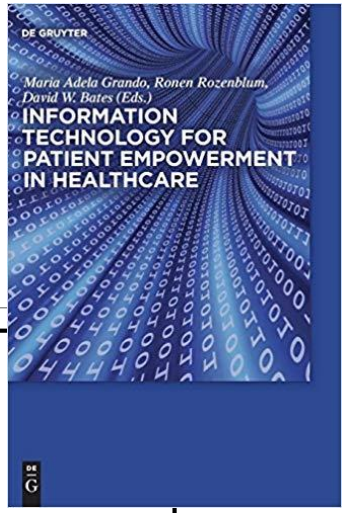


HEALTH IT BENEFITS

Health IT Benefits

- Accessibility
- Support for many HC providers
- Standardization
- Improve communication between HC providers
- Communicate with patients
- Minimize manual input
- Tracking
- Statistics & Data aggregation
- Integrate artificial intelligence & access to knowledge
- Integration to CDSS
- Reduce adverse events
- Forcing functions
- Sending Reminders (manual/ automatic)
- Don’t rely on human memory

IT enhances Patient Engagement



- Access to their health records
- Self managing chronic diseases
- Direct communication with their providers
- Coordinate their care across of many caregivers
- Interact with other patients with similar conditions

Promising technology

- Personal Health records
- Mobile health devices
- Patient portals
- Internet based resources
- Social media networking

IT Enhances patient safety

New technology reduces adverse events through:

- Good design
- Facilitation of a response to an adverse event
- Providing feedback after an event

<u>At TWO levels:</u>

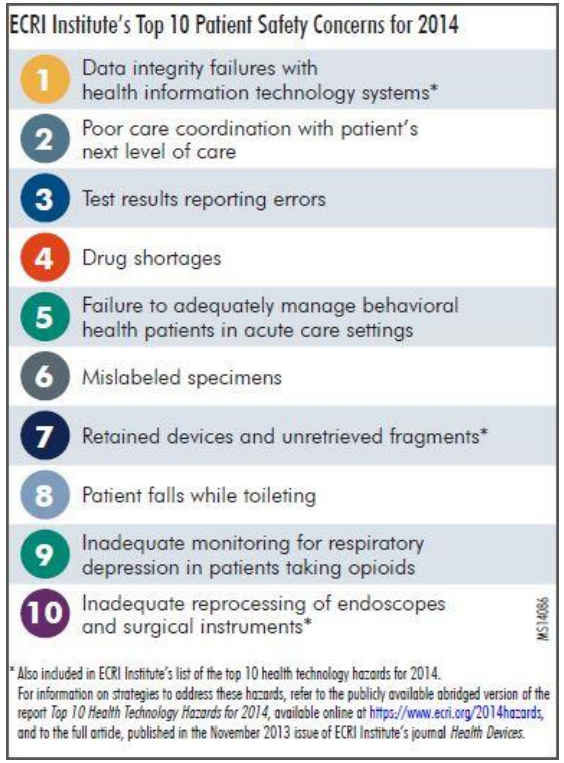
- Individual user
- System level

The CADTH & AHRQ provides information about the effectiveness and efficiency of health technologies

IT Enhances patient safety : CPOE

- ✓Eliminate transcription errors
- ✓ Provide clinical decision support
- ✓ Alert physicians to possible dangerous orders

HEALTH IT RISKS

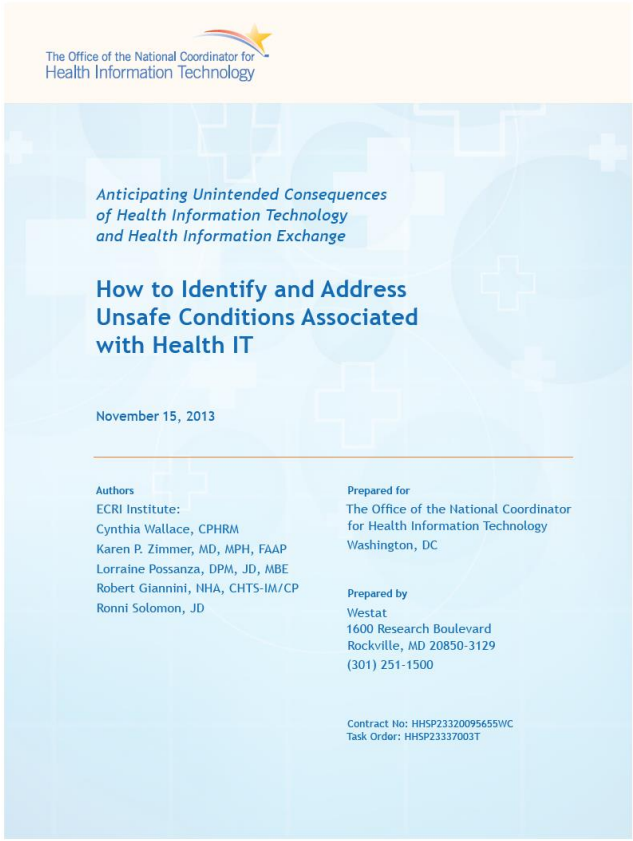


ECRI TOP 10 Patient Safety Concerns

DIAGNOSTIC STEWARDSHIP AND TEST RESULT MANAGEMENT USING EHR

IT Risks

- Development
- Installation
- Training
- Unavailability of the system
- Malfunction during Implementation
- Misuse : human machine interaction
- New Upgrade of system
- New interfaces causing loss of data or inaccurate data entry


The Office of the National Coordinator for Health Information Technology

Anticipating Unintended Consequences of Health Information Technology and Health Information Exchange

How to Identify and Address Unsafe Conditions Associated with Health IT

November 15, 2013

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Karen P. Zimmer, MD, MPH, FAAP
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Prepared for
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Washington, DC

Prepared by
Westat
1600 Research Boulevard
Rockville, MD 20850-3129
(301) 251-1500

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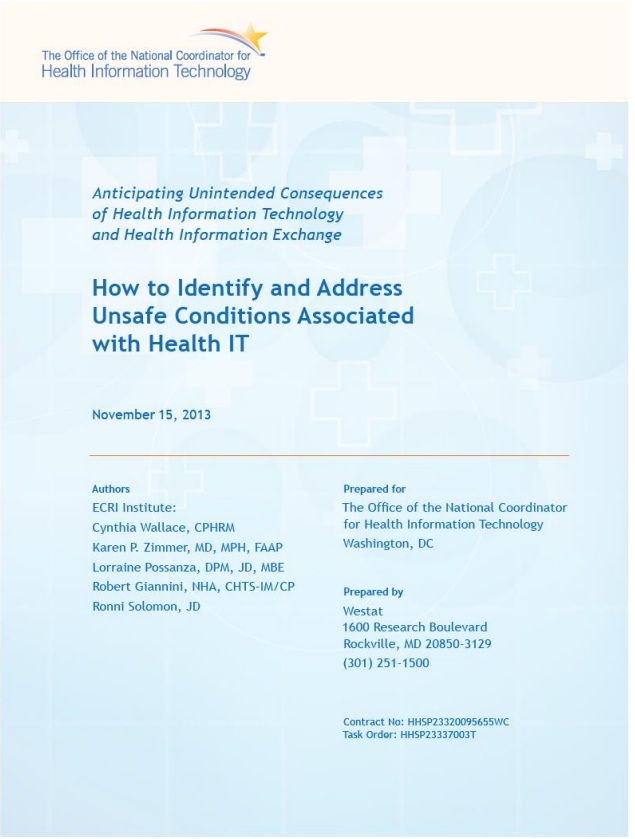
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IT-Related Common Problems

At the interface

Entering data on a misidentified patient

Failure to alert the user of a concern

User ignore and override an alert

Not enough equipment cause delays in data entry

Delay in revision of lab results

No evidence of a written order

Tests results sent to the wrong provider

Gaps in trainings

IT-Related Common Problems

Functional

- Unclear data display
- Malfunction of the hardware
- Loss of Data
- Unapproved data entry devices
- Interface issues with lab systems lead to delays in retrieving data
- Software not up to date
- Internet or server connectivity prevented real-time data entry
- Breach in the security of the system

TOP 5 SAFETY ISSUES

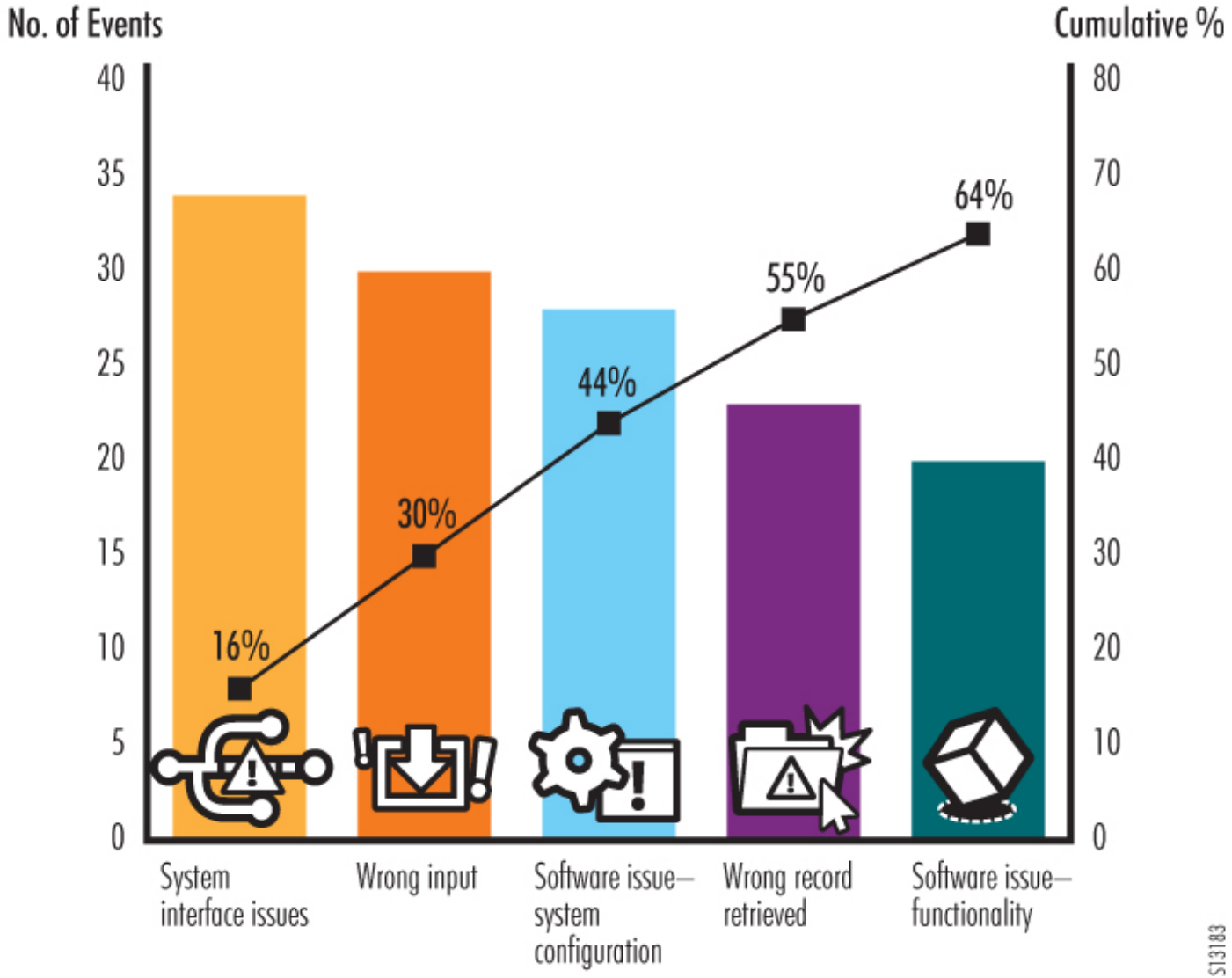
ECRI Institute PSO Deep Dive Study

Data entry in wrong patients files

Gaps in reporting critical tests

211 PS issues grouped into 22 categories

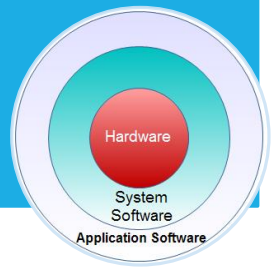
Top Five Safety Issues from Health IT Events



ECRI Institute PSO's analysis

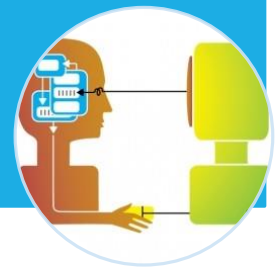
- System Interface
- System/Software configuration
- Software function

Computer Related Issues



- Wrong Data Input
- Wrong record retrieved

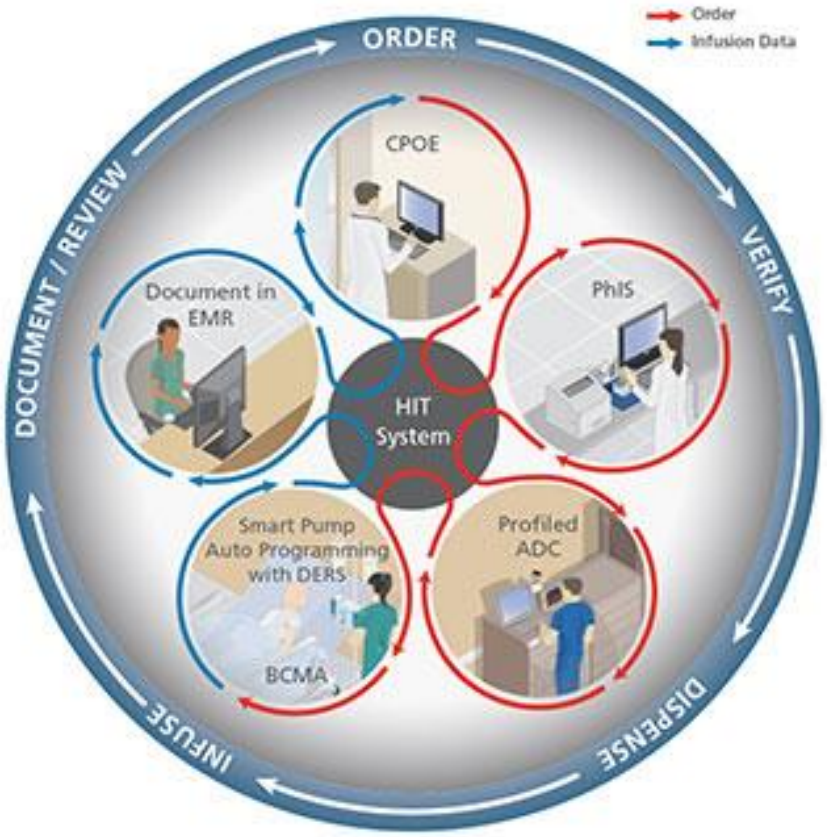
Human-Computer issues



Smart Pumps

- ✓ Pump-Programming errors
- ✓ User Bypassing the drug database
- ✓ User Overriding alarms

Automated Dispensing Cabinets



- ✓ Storage & Automatic Dispensing Cabinets
- ✓ At the point of use
- ✓ Medication and supplies
- ✓ Controlled
- ✓ Tracking the use (usernames and passwords)
- ✓ Error in filling similar unit-based cabinet lead to the death of patients (2006)
- ✓ Don’t forget the importance of double checkers (nurses & pharmacists) during the restocking and administration processes

Bar Coding Technology

- Assist in medication administration, blood samples labeling and identification
- Barcodes scanners in patients rooms
- Cross-linkage to other HIS as Patient index files. eMAR, OES..
- National concensus on the use of barcodes (ISMP & CPSI)
- Some Professionals have problems with this technology causing delays in patient care

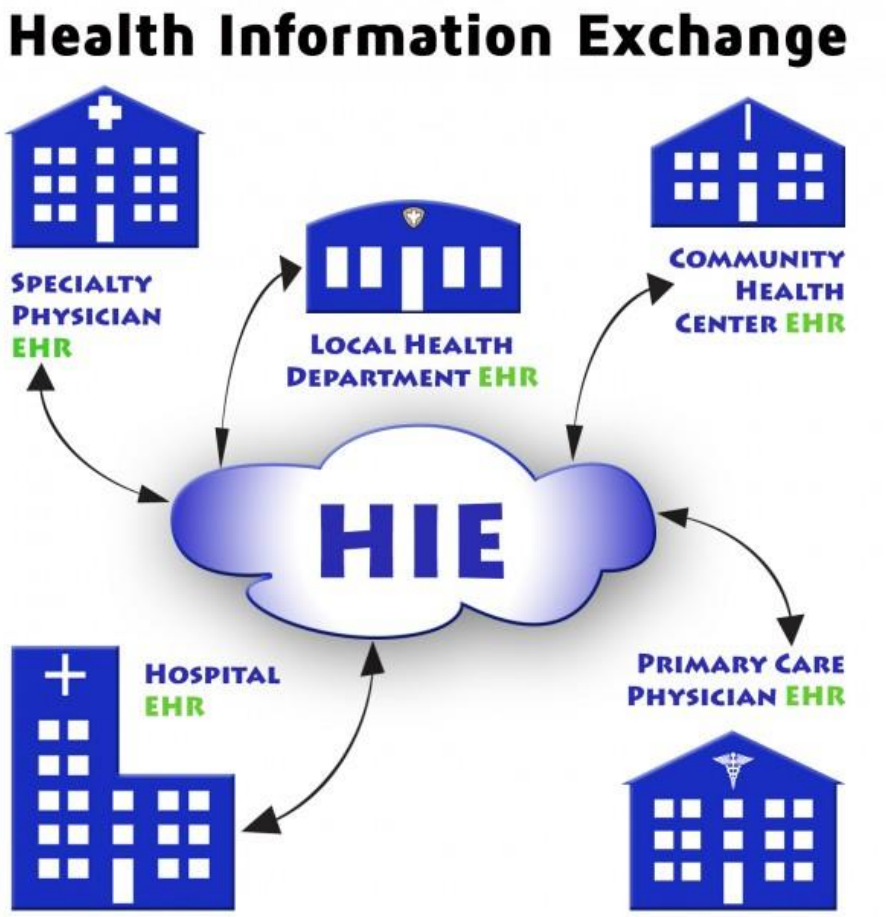
Software systems

- Physician support at the point of care
- Gathering, storing and reporting of health information
- Examples : Computerized care documentation, CDSS, CPOE
- This technology needs to fit into hospital workflows
- Risks: Delays

  Disruptions

  Duplication of work

  Legal: exchange of sensitive health data

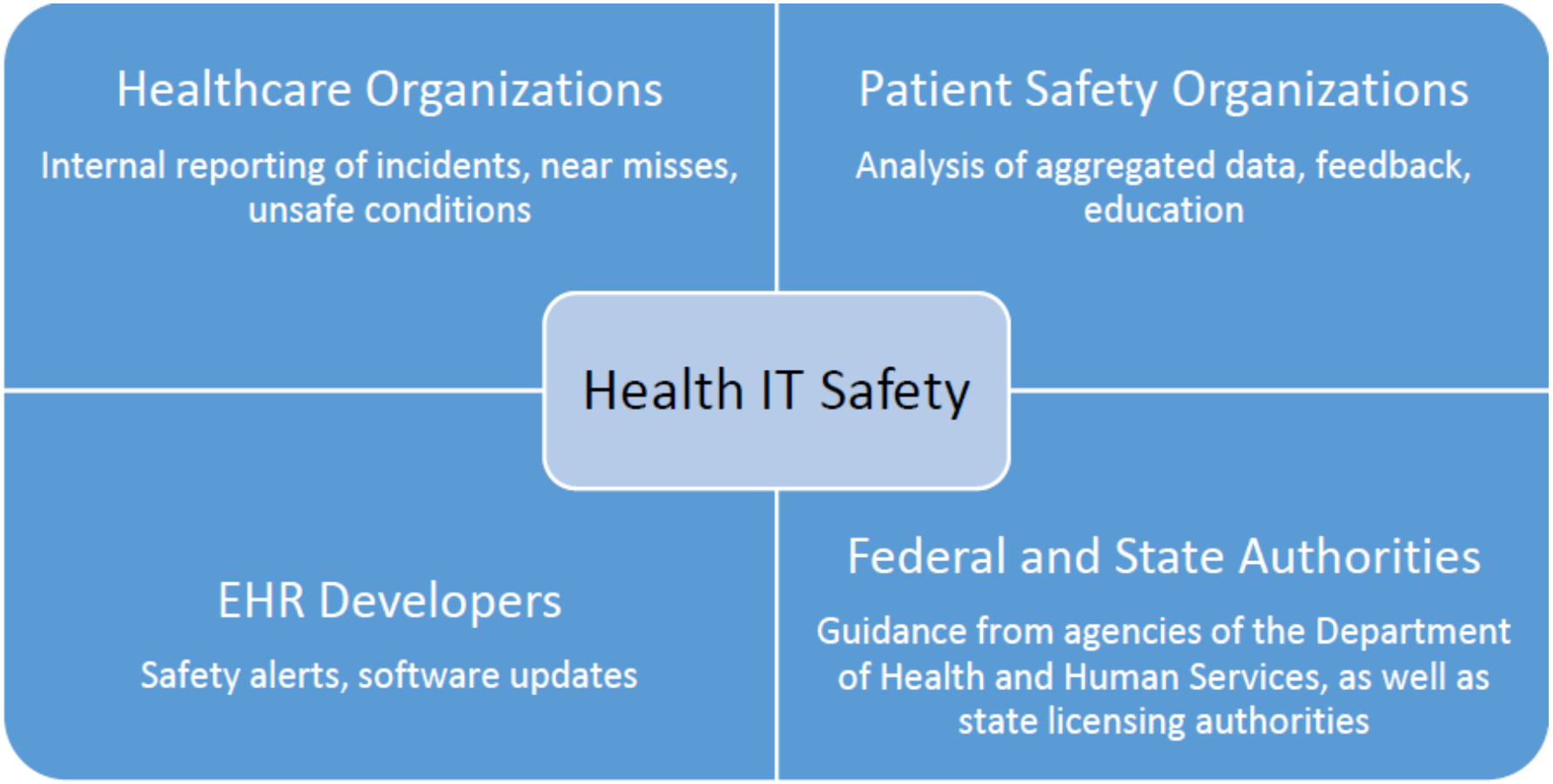


EMR-HER-EPR

- Reduces errors due to poor handwriting
- Reduces lost patient information
- Better and Accurate information
- Risk of copy-paste
- Risk of accessing the wrong patient file
- Risk of error in interface with diagnostic testing

HEALTH IT RISK MANAGEMENT

Shared Responsibility



Regulation of IT in healthcare

- Presence of a body to assess the safety and effectiveness of medical devices before authorizing sales
- Development of standards to support systems' interoperability (ISO, IEC)
- Some IT systems as EHR and eMAR are still not subject to these regulations

ORGANIZATIONS RESPONSIBILITIES

- Risk Identification
- Risk Analysis
- Risk Mitigation
- Implement strategy
- Monitor Effectiveness

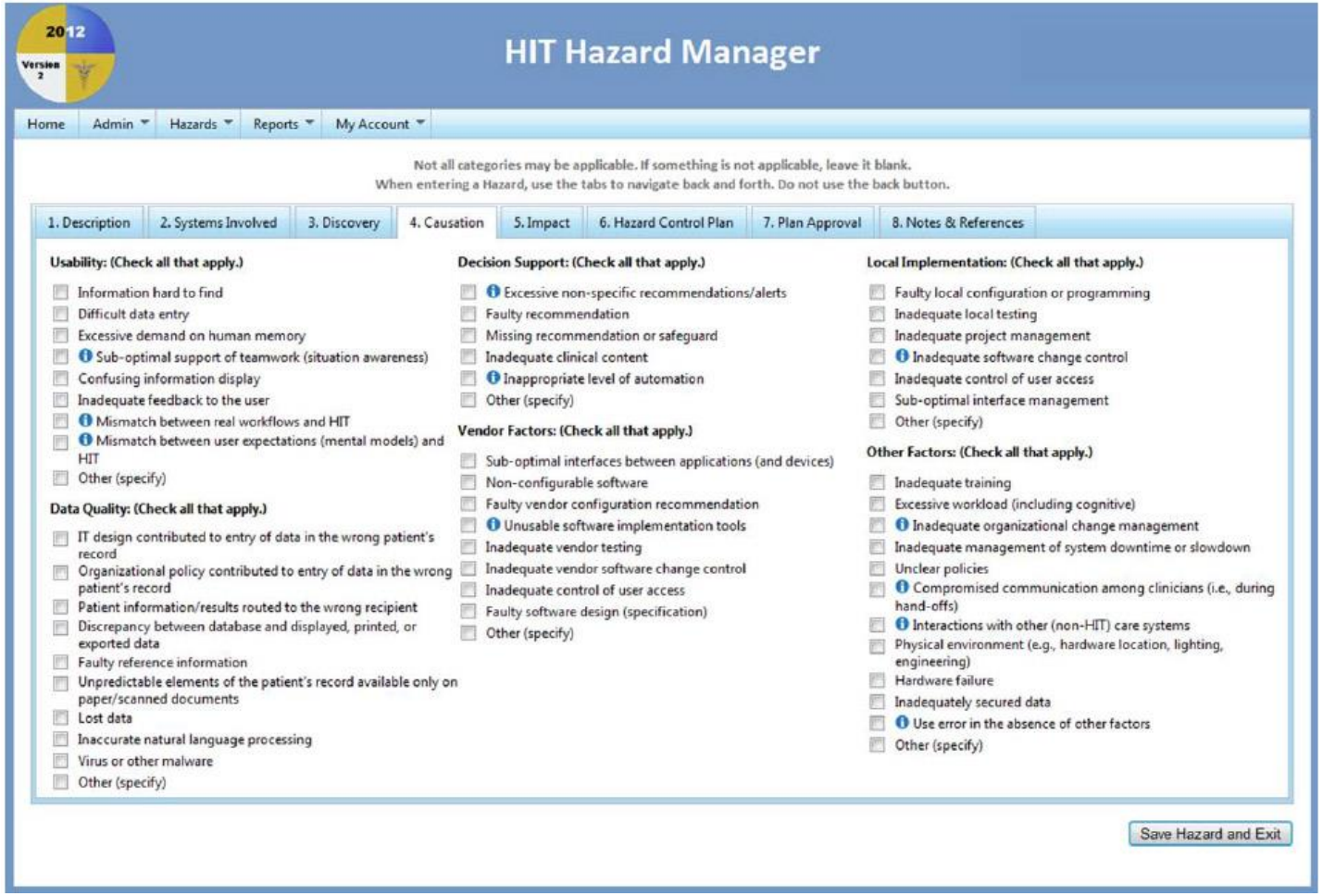
Identify Hazards

1. Know well your system
2. Identify 5 most common IT problems that might lead to potential patient harm
3. Examine your reporting system on IT hazards
4. Review the role of EHR and IT department

HRO commitment to Safety Culture :

Report the Risk

- Educate Staff on IT safety
- Everyone's responsibility
- Open Communication
- Empower staff to report IT risks
- Empower staff to improve
- Blame free culture

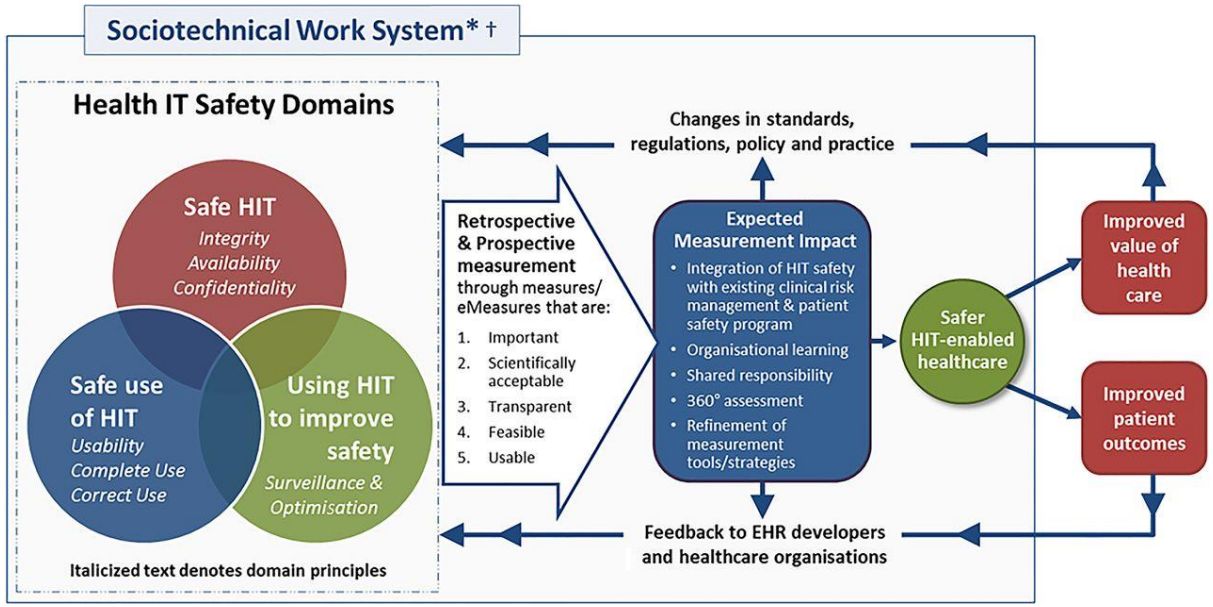


Risk Analysis

1. Structured, step by step
2. Determine underlying causes
3. FMEA
4. RCA
5. Conduct in depth examination of the 8 socio-technical dimensions

Action, Feedback & Monitoring

1. Provide Staff with the feedback
2. Inform everyone about the improvement strategy
3. Monitor the effectiveness of new strategies and solutions
4. Monitor effectiveness of use of reporting structure



Measuring and improving patient safety through health information technology: The Health IT Safety Framework

Hardeep Singh,[1] Dean F Sittig[2]

Singh H, Sittig DF. BMJ Qual Saf 2016;25:226–232. doi:10.1136/bmjqs-2015

CONCLUSION

PITFALLS

- Relying on technology to reduce risk and ensure safety
- Not having enough resources for implementation
- Technology leads to Clinical improvements

PEARLS

- Health IT shall be developed Optimally and encouraged
- The healthcare organization shall implement the system in a high reliable way : be aware of risks
- Safety Culture: All errors and bugs need to be reported promptly and accurately
- Have the will to learn about unsafe conditions with IT
- Improves the system before harm occurs
- Train Staff on the system use
- Careful: What is current might change

References

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- How to Identify and Address Unsafe Conditions Associated with Health IT , ECRI Institute: Cynthia Wallace, CPHRM -Karen P. Zimmer, MD, MPH, FAAP - Lorraine Possanza, DPM, JD, MBE - Robert Giannini, NHA, CHTS–IM/CP -Ronni Solomon, JD