“A Value Add Opportunity”: An HFMEA Addresses Workflow, Safety and Adoption

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Agenda

- Learning Objectives
- Atlantic Health Background
- Clinical Technology Situation
- Value of CPOM
  - Key Process Impacts
- Failure Points and Errors
- HFMEA Selection
  - Identifying Risks
  - Creating the Action Plan
  - Lessons Learned
- Summary

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Learning Objectives

- Engaging clinical stakeholders
- Creating an environment for change
- Selecting a powerful tool to infuse quality
- Mitigating risks of technology implementations
- Developing targeting action plans to reduce risks and build adoption

Atlantic Health Background

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Health System Characteristics

- Non-profit, multi-hospital system located in Northern New Jersey
- Service Area consists of 3 million residents in eight counties in Northern and Central New Jersey
- Atlantic Health is the primary academic and clinical affiliate in New Jersey of Mount Sinai School of Medicine and the Mount Sinai Hospital
- Partner with the Cancer Institute of New Jersey
- Over 50 medical/surgical specialties

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Atlantic Health Profile

- Two hospitals
- 10,000 employees
- 2,400 physicians
- 250 residents
- 1,197 licensed beds
- 50+ operating rooms
- 6,800 births
- 62,000 admissions
- 600,000 outpatient visits
- 158,000 emergency visits
- Children's Hospital
- Heart Hospital
- Cancer Center
- Cardiovascular Institute
- Neurosciences Institute

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Clinical Vision

CPOM identified as a strategic patient safety tool

- **Clinical Vision**
  - Deliver high quality, safe, affordable patient care
  - Improve the health status of the communities we serve
  - Educate in an exemplary manner to our health care professionals

- **Expected CPOM Outcomes**
  - Physicians enter the maximum volume of orders via CPOM
  - Accurate exchange of information within Closed Loop
  - Physician involvement & ownership in the CPOM solution
  - Order entry efficiency
  - Improved efficiencies through CPOM by reducing medication delivery time and clarification calls

Clinical Technology Situation

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CPOM Rollout

- **CPOM Rollout Approach**
  - CPOM rollout across two hospitals
    - Initial approach department-focused pilot in pediatrics
    - Transitioned from departmental model to Resident/Hospitalist and Early Adopters
    - Completed house-wide go-lives at both campuses for select provider populations
  - CPOM rollout focus
    - Drive adoption by targeting:
      - Early adopters/Early Majority
      - Adapting workflow to technology
      - High order generators
    - Reduce process-related issues stemming from isolated areas of usage and mixed manual/automated workflow

Impacts of CPOM at Atlantic Health

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CPOM Impacts

- **CPOM - a "paradigm" shift**
  - Three layers of the paradigm shift
    - People
    - Process/Workflow
    - Technology
  - First Layer – People
    - Automating processes exposes clinical ownership issues
    - Technology forces clinicians to examine who is ultimately responsible for managing clinical information
    - Overcoming physicians' common fears;
      - Increases time at the computer & decreases time with patient
      - Alerts will interrupt workflow
      - Traditional routines will be altered

Issues are effectively resolved when there is clear ownership

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CPOM Impacts

- Second Layer – Workflow
  - Physicians play a greater role in the medications delivery (i.e. scheduling/preparations)
  - Pharmacists move away from data entry and towards overall management patient medication profile
  - Nursing is challenged to maintain the therapeutic milieu for the patient through the use of technology
  - Paper-based and electronic workflow create dual workflow for clinical areas

Work-effort changes from "what" people do to "how" they do it

- Third Layer – Technology
  - Technology can not suffice for human decision making capabilities
  - Need to create a intuitive user-interface

Applying or removing automation to processes highlights workarounds

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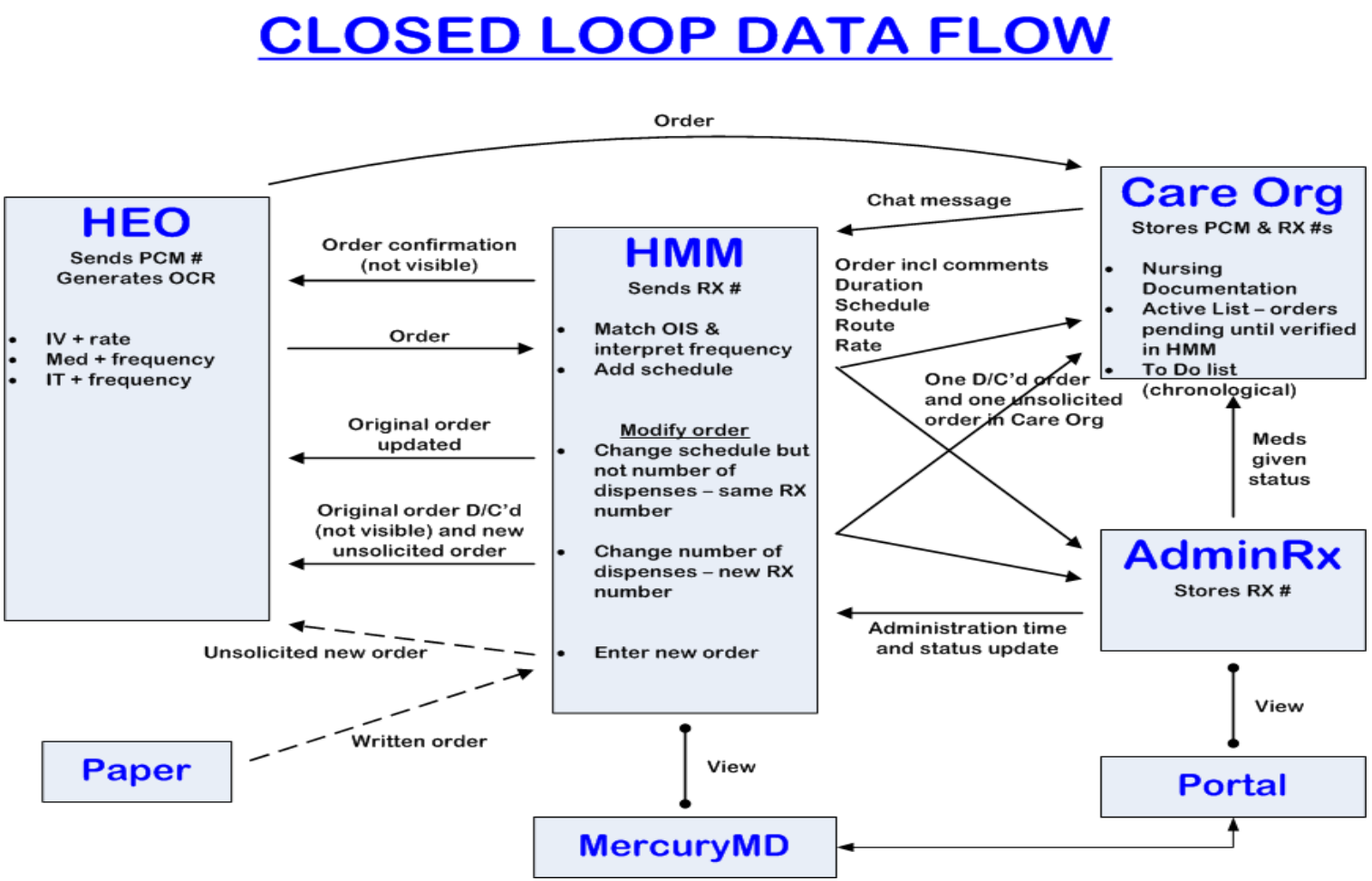
Closed-Loop Data Flow



CPOM Failure Points

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Failure Modes

- The Institute of Healthcare Improvement (IHI) defines information hand-offs and transitions in care as a potential failure points:
  - Potential for breakdown in verbal communications
  - Possible failure of technology to communicate cross-departmentally
  - Potential for therapies to be discontinued/missed with level of care changes
- Opportunities abound to improve upon:
  - What is communicated
  - Who is the recipient of the information
  - How is the information delivered

A Failure point in any process leads to disruptions in delivery/service and ultimately create dis-satisfiers and risks to patient safety

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The Joint Commission

- The Joint Commission highlights ensuring the review and accuracy of medications upon change in the level of care as a key safety issue:
  - Almost 46% of medication errors occur when new orders are written at the time of admission or discharge
  - Strong medication reconciliation/review processes at the time of admission, transfer and discharge may create up to an 85% reduction in medication related errors
- To appropriately address the potential risks/failures with medication ordering process, The Joint Commission recommends:
  - Active nursing, pharmacy and physician involvement in the process
  - Consider the use of technology to support and facilitate medication reconciliation process

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Addressing Points of Failure

- Situation:
  - The pharmacy application functionality enabled medication orders to automatically discontinue upon a “perceived” change in the level of care – automates the process of reviewing/reconciling medications upon transitions in care
    - Medications remained active when they should be discontinued and discontinued when they should have remained active
- Challenge:
  - The automatic discontinuation of pharmacy orders is driven by an ADT system that only recognizes actual bedded units
  - Automatic discontinuation of medication orders in a CPOM environment creates disruption and dissatisfaction for end-users
  - Medications are required to be reviewed and re-ordered upon a change in the level of care
    - Needed clinical definition of level of care change
    - Strong focus on medication review processes

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Addressing the Points of Failure

- Strategy:
  - Need to employ a strategy that assesses the risk/benefits of de-activating the pharmacy application functionality and supports the future state
  - Create clinical workflow that moves medication review/reconciliation from an automated process to a deliberate ownership-based model
  - Complete risk/benefit analysis and action plan prior to house-wide rollout of CPOM
  - Selected an HFMEA as an ideal tool to identify and address risks and also create an action plan that mitigates risks and moves towards the future state

The Joint Commission requires organization to perform an HFMEA on one process of their choosing each year

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Addressing Points of Failure

- Objectives:
  - Determine if the existing state (pharmacy functionality intact) is ultimately safer than de-activating the functionality, with and without a CPOM environment
  - Develop a process for all clinical stakeholders that supports disabling the technology
  - Monitor and re-evaluate the process to ensure the correct actions are taken and unnecessary risks are not produced
  - Identify and engage stakeholders to communicate, educate and own clinical processes going forward

HFMEA Selection

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Failure Mode Effect Analysis

- HFMEA
  - Healthcare Failure Mode Effect Analysis provides a robust tool to analyze potential failure points and take the necessary action to mitigate
    - Group consensus from key clinical stakeholders necessary to determine potential failure points and appropriate action plans
  - The HFMEA can be an effective way to bring key stakeholders together to obtain buy-in and to remove obstacles to adoption
  - HFMEA is an effective way to demonstrate the appropriate steps to mitigate potential risks where taken

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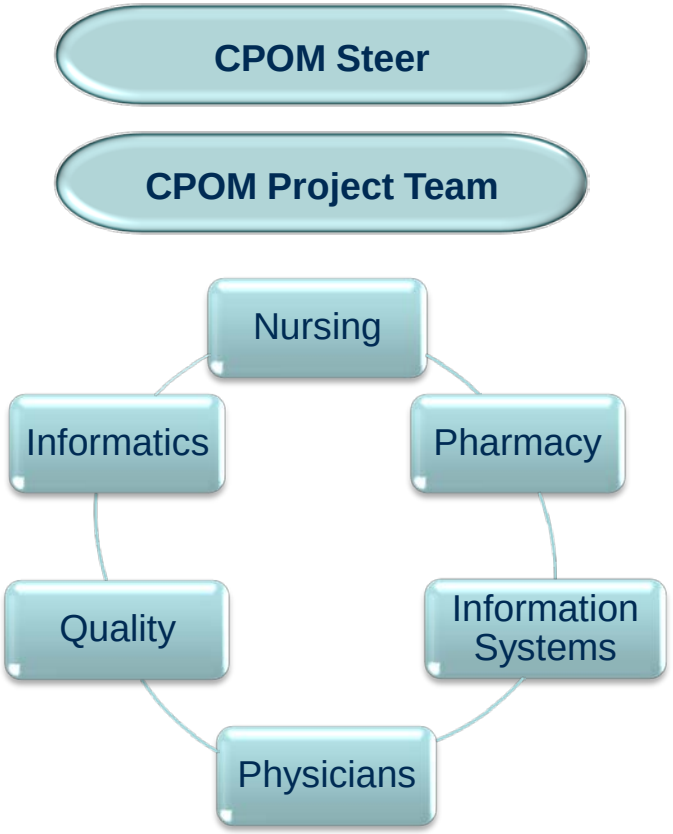
Assembling the FMEA Team

Team Characteristics

Process owners
Subject matter experts
Decision makers
Action owners
Communication conduits
Facilitator
HFMEA advisor



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Workflow Analysis

- Analyze the underlying processes:
  - Select process beginning and end points
    - Gain agreement on what is to be evaluated
  - Process level owners are essential to accurately defining how the process "*actually*" works
  - A well constructed process map becomes the foundation for the FMEA to build on

- Identifying failure points
  - The HFMEA team determines which areas within the process are subject to possible failure
  - All possible failure points are labeled – not the most likely

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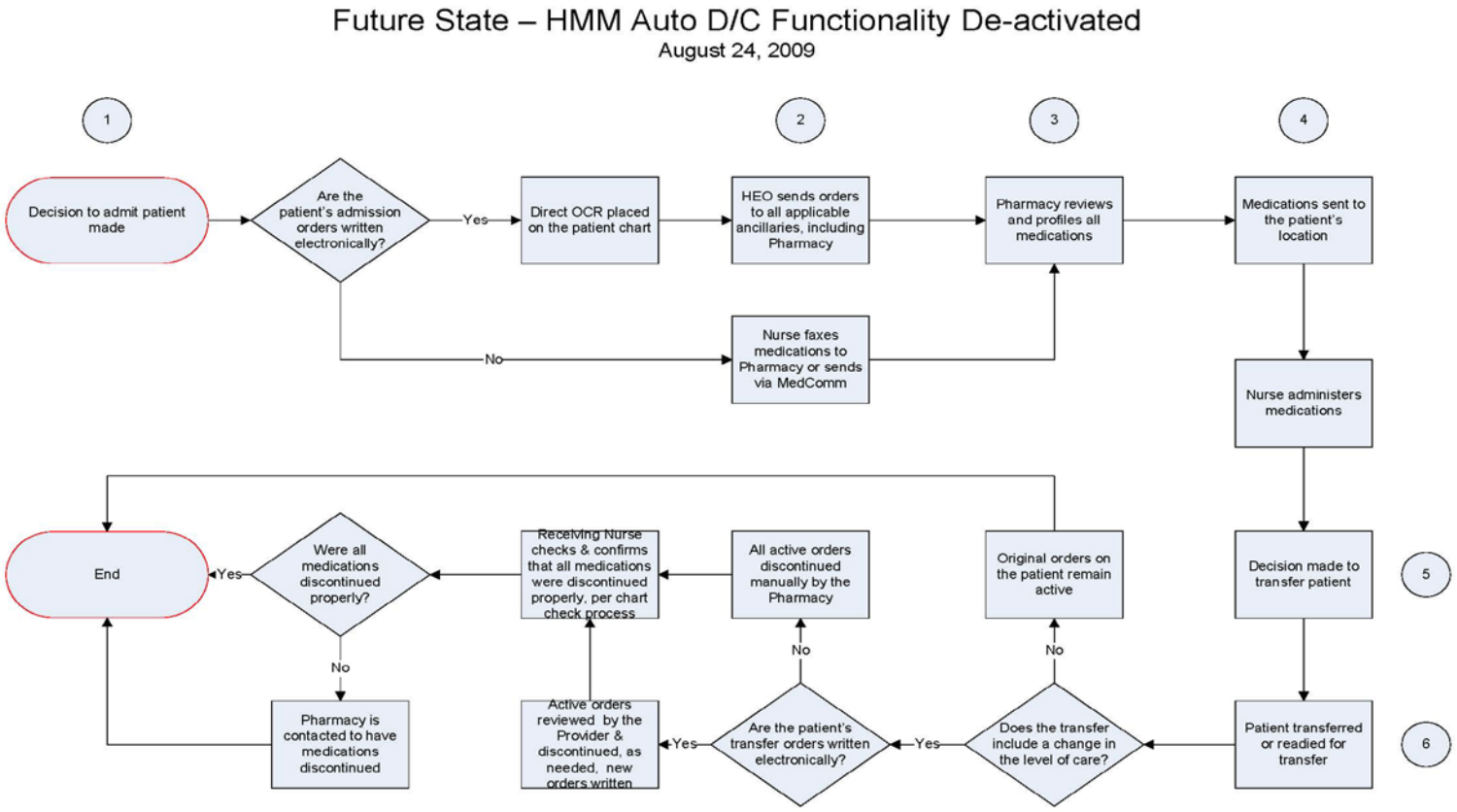
Workflow Analysis

Begin High-Level with Failure Points



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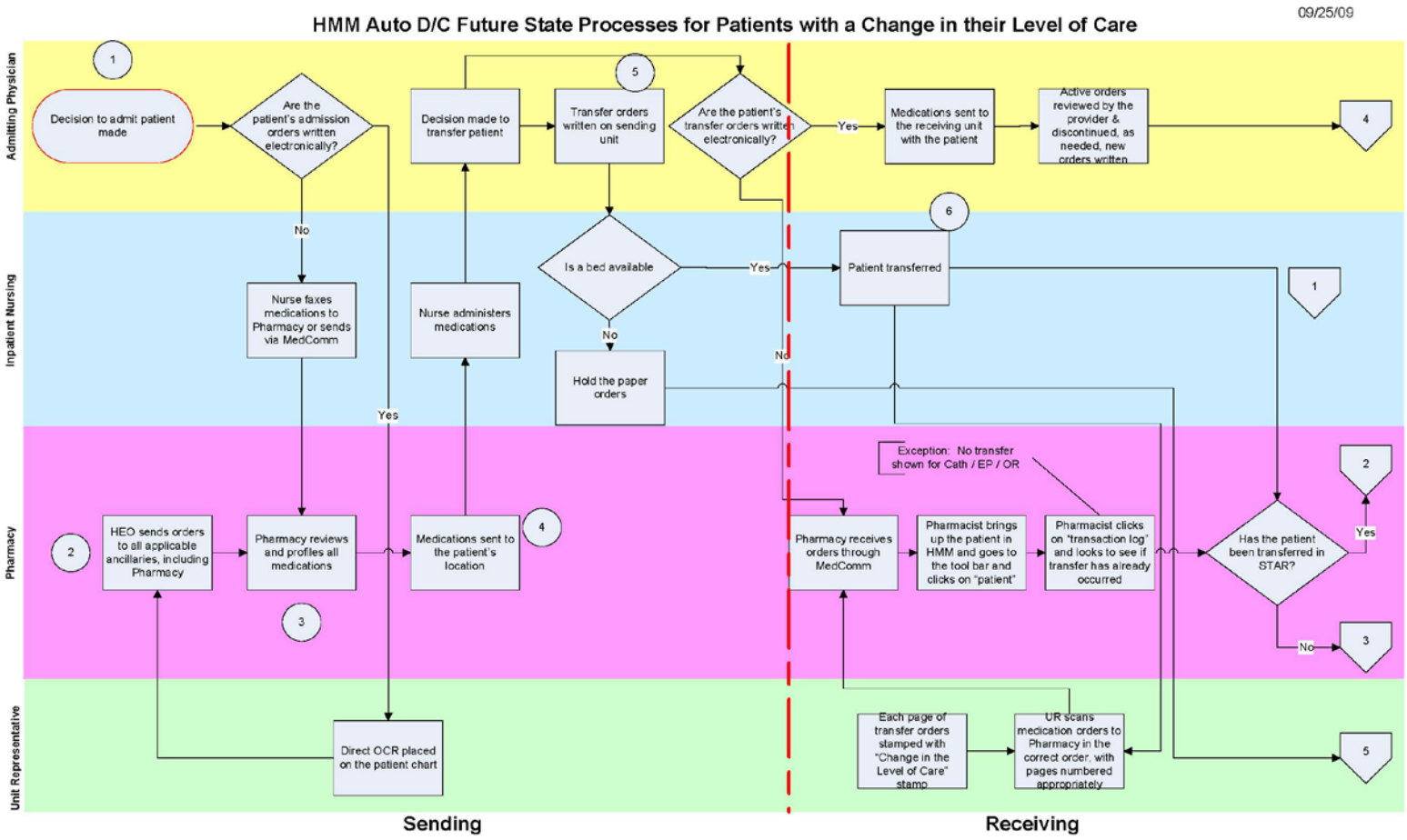
Workflow Analysis



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Assigning the Hazard Score

- Hazard Analysis
  - Severity and probability are assigned to each process failure point
  - The use of a hazard score differentness a HFMEA from a traditional FMEA

Probability	Severity of Effect			
	Catastrophic	Major	Moderate	Minor
Frequent	16	12	8	4
Occasional	12	9	6	3
Uncommon	8	6	4	2
Remote	4	3	2	1

A Value Add Opportunity Hazard Analysis

Failure Point	Process Step	Potential Failure	Causes	Severity	Probability	Hazard Score	Action
6	Transfer of patient	Meds given inappropriately when should have been discontinued/changed	No auto D/C due to location change	C	U	8	Level of care recommendation – change based on ICU/Step-down or surgical transfers Evaluate risk

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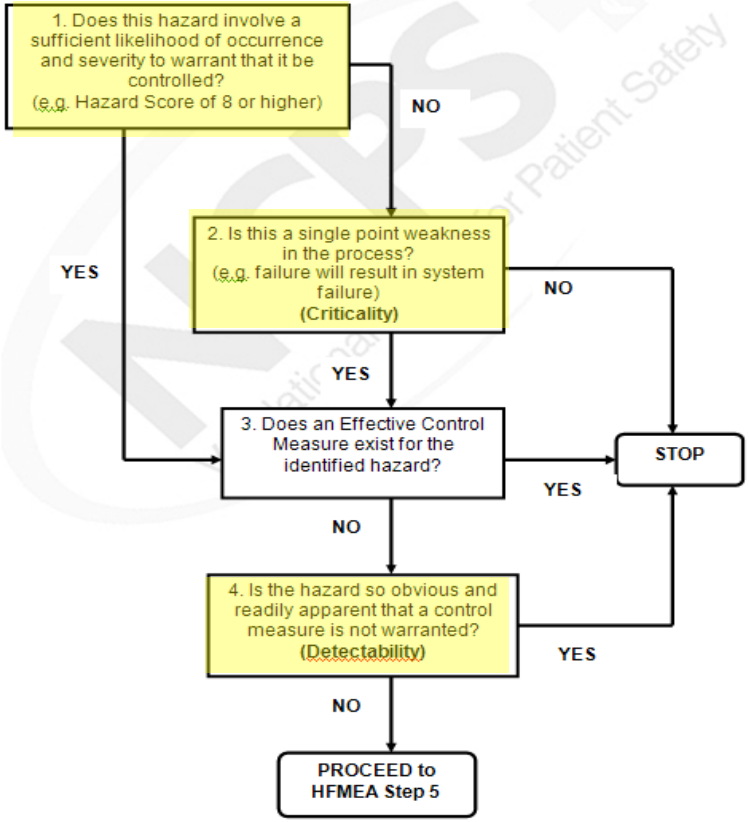
HFMEA Decision Tree

- Determining the correct path
  - Using the decision tree, the group determines the feasibility of moving forward with the future state process
  - A well designed future state process and action plan will support moving forward and lower hazard scores



Courtesy of VA National Center for Patient Safety

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Executing the Action Plan

- HFMEA Action Plan
  - All actionable items are assigned owners responsible for delivery
  - Communications are deliberately recognized and assigned to key communication owners
  - Each process area commits to and delivers education for their respective areas
  - Execution of the action plan requires a rigorous monitoring and evaluation process by the ***whole*** team

- Achieving Results
  - The action plan is executed with the same intent of a traditional go-live
  - Status updates and communications are delivered daily to all stakeholders
  - Issues are logged and managed continually

Significant Learnings

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Learnings

- **Workflow**
  - A well-defined process is the foundation of the HFMEA – the integrity and results of the HFMEA depends
  - An HFMEA is most effective when “true” process owners are engage
  - Regardless of the hazard score – if the future state process is not followed the potential risk incurred is always greater than what was anticipated
  - A well designed, well executed process will achieve clinician buy-in and foster adoption
  - An HFMEA can provide stronger analysis of a process than process mapping alone
  - Continuous monitoring, revising of process maps and re-implementation is necessary and not a sign of failure

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Learnings

- People
  - Key stakeholder engagement assisted in ensuring process steps were followed and risks mitigated
  - A comfort level in removing the functionality was obtained through group consensus
  - The implementation of the future state process revealed flaws with staffing models
- Technology
  - The HFMEA helped to ensure that de-activating the pharmacy application functionality was the appropriate action

As a result of the HFMEA, the pharmacy undertook a significant staffing re-modeling and workflow redesign to create an optimal state for patient-care

In Summary

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Summary

- CPOM in a closed-loop environment is a complex interaction of technology and clinical processes
- Clinical engagement and ownership of the process with CPOM is essential to adoption and safety
- A HFMEA is a robust process improvement tool that reduces potential risks associated with technology implementations
  - Requires a multi-disciplinary team to share in process development
- Rigorous process improvement can yield results far greater than anticipated