Automation Down - How to Maintain Inventory for Patient Safety

Presenter:

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2026 ICHP Annual Meeting

Conflict of Interest

- I have no conflicts of interest with ineligible companies to disclose

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Learning Objectives

- Describe the patient safety risks associated with partial automation availability.
- Outline strategies for maintaining accurate inventory in hybrid workflows.
- Identify best practices for staff coordination and workflow adaptation during construction-related automation limitations.

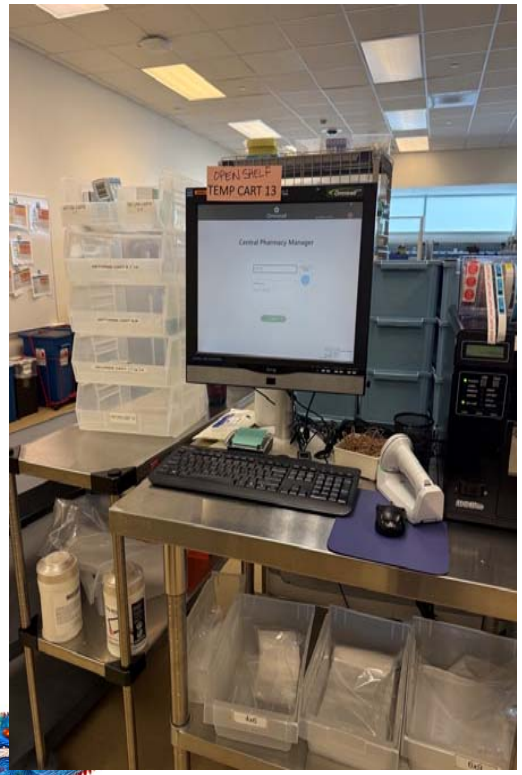
LFH Pharmacy Background

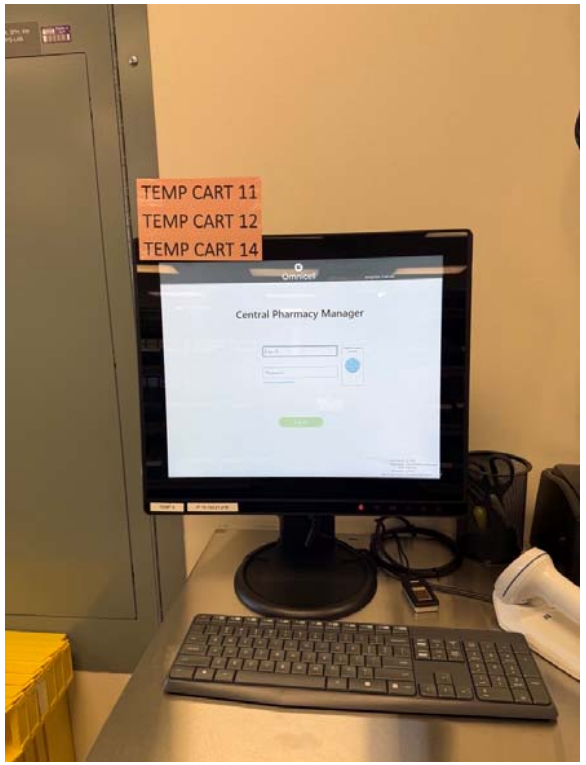
- Current pharmacy opened in 2018
- Approximately 200 inpatient beds
- Multiple hospital clinics who purchase medications from pharmacy
- OR pharmacy
- Outpatient infusion pharmacy
- Following hospital expansion, pharmacy moved to a temporary space to expand

LFH Temp Pharmacy Layout

- 7 computers that control 15 temp carts
- Temp carts house bins that have been removed from the old carousel
- Bags, auxiliary stickers and writing utensils are housed at each station
- Pharmacist workstation is centrally located in the middle of the temp carts
- IV room for compounding
- HD compounding takes place in infusion pharmacy

LFH Temp Pharmacy Layout





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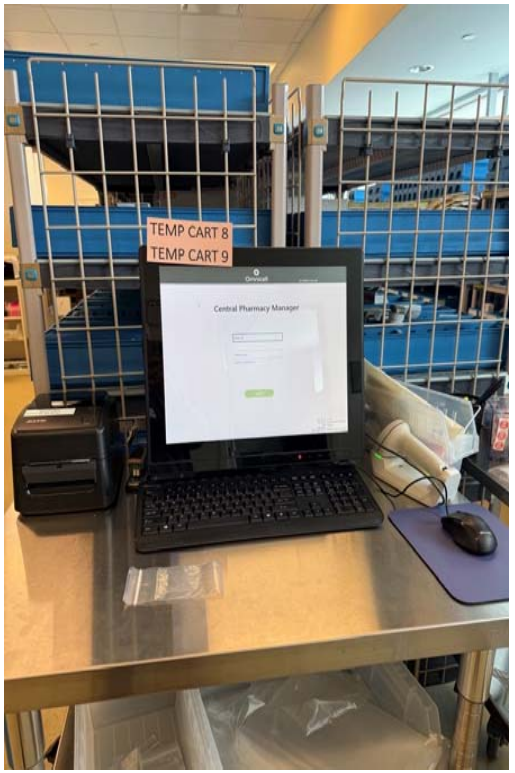
LFH Temp Pharmacy Layout



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Patient Safety with Automation

Pharmacy automation systems support safe medication-use processes by improving inventory visibility, enhancing medication tracking, reducing manual documentation, and facilitating timely replenishment.

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Patient Safety Risks with Partial Automation

During construction, renovation, relocation, or phased implementation projects, automation may only be partially available, creating gaps in inventory management processes. These disruptions can increase the risk of medication errors, inventory discrepancies, and delays in patient care if not proactively managed.

What is Partial Automation?

Examples include:

- Automated dispensing cabinets (ADCs) remain functional, but carousel systems are unavailable.
- Inventory management software is operational, but barcode tracking processes are interrupted.
- Temporary pharmacy spaces require some inventory to be managed manually.
- Construction limits access to automated storage equipment.
- Medication replenishment workflows require both automated and manual processes.

This hybrid environment creates opportunities for process variation and increased risk.

What Types of Partial Automation are we using?

- During construction of the new pharmacy, we have full access of ADCs (Automated Dispensing Cabinets), but we have moved from Carousels to open shelves
- We still have access to our inventory management system but maintaining the inventory has been a challenge
- Barcode scanning is still involved, however the ability to grab meds from bins increasing the risk of taking the wrong medication
- Time to restock initially increased but has since stabilize

Assessment Question #1

What are some examples of partial automation?

What types of partial automation have you used or are you currently using?

Patient Safety Risk Factors

Contributing Risk Factors During Construction

- Frequent relocation of inventory
- Space limitations
- Temporary workspaces
- Staff unfamiliarity with new workflows
- Reduced automation functionality
- Increased reliance on manual processes
- Staffing changes and competing priorities
- Lack of standardized downtime procedures

What are we doing to mitigate risk?

- Frequent relocation of inventory
  - We are limiting moving inventory now that it is in the temp pharmacy
- Space limitations
  - We got creative with our space; separating LASA meds similar to how we had in the carousel
- Temporary workspaces
  - Staff is still getting used to where items are
- Staff unfamiliarity with new workflows
  - We kept our existing workflow and adapted it to our new space
- ~~Reduced automation functionality~~
- Increased reliance on manual processes
  - Larger space requires more checking of workstations and increased walking
- Staffing changes and competing priorities
- ~~Lack of standardized downtime procedures~~

How to Maintain Inventory in a Hybrid Workflow

- **Strategy 1: Standardize Inventory Documentation**
  - One of the largest sources of inventory discrepancies during partial automation is inconsistent documentation.
- **Strategy 2: Implement Frequent Inventory Reconciliation**
  - When automation is limited, inventory balances can quickly become inaccurate.
- **Strategy 3: Establish Controlled Medication Relocation Processes**
- **Strategy 4: Strengthen Inventory Visibility**
  - Staff cannot manage inventory effectively if they cannot identify where medications are stored.
- **Strategy 5: Prioritize High-Risk Medications**
  - Not all inventory carries the same level of patient care risk
- **Strategy 6: Clearly Define Roles and Accountability**
  - Hybrid workflows create opportunities for tasks to be overlooked.
- **Strategy 7: Monitor Expirations and Product Integrity**
  - Automation often assists with rotation and expiration management.

Case Study

Scenario:

A pharmacy construction project temporarily closes the central carousel. Medications are moved to mobile shelving units while ADCs remain operational.

Assessment Question #2

What are the potential risks with this scenario?

What are some effective inventory strategies?

What is the targeted outcome?

Understanding the Human Factor During Change

Construction Introduces Operational Stressors

Construction-related workflow changes can result in:

- Increased cognitive workload
- Interruptions and distractions
- Changes to established routines
- Competing priorities
- Workflow uncertainty
- Staff fatigue and frustration

Understanding the Human Factor During Change

Impact on Patient Safety

When staff are forced to create workarounds or adapt without clear guidance:

- Error risk increases
- Communication failures occur more frequently
- Critical tasks may be missed
- Situational awareness decreases

Managing Change Fatigue

When Construction Projects Linger

Staff may experience:

- Frequent workflow modifications
- Repeated location changes
- New responsibilities
- Ongoing operational uncertainty

Managing Change Fatigue

Leadership Strategies

- Explain the reason for changes
- Limit unnecessary process modifications
- Celebrate successes
- Solicit frontline feedback
- Provide frequent updates

Managing Workflow Drift

What is Workflow Drift?

- The gradual movement away from standardized procedures as staff adapt to operational challenges.

Examples:

- Skipping documentation steps
- Bypassing verification processes
- Creating unofficial storage locations
- Developing individual workarounds

Risks:

- Inconsistent practices
- Increased error potential
- Regulatory concerns
- Reduced accountability
- Best Practice
- Regularly evaluate temporary processes to ensure they remain safe and standardized.

Other Best Practices for Staff Coordination

- Understand human factors and cognitive workload
- Establish clear escalation pathways
- Coordinate across departments
- Learn from near misses

Plan for Workflow Disruption

- Identify impacted automation areas
  - Still identifying bins that do not exist
- Assign clear staff roles and backups
  - New workflow was rolled out during expansion; adapted to temp space
- Communicate workflow changes before shift start
  - Not always achievable due to call ins/emergencies
- Escalate delays or access issues promptly

Communicate Changes Clearly

- Review updates during shift huddles
  - Following the move leadership reiterated the importance of settling in and alerting us of any issues at daily huddles
- Notify departments of temporary process changes
  - Multiple departments were notified of our move and reduction of automation
- Use one consistent location for workflow updates
- Reinforce expectations for labeling, delivery, returns, and waste

Maintain Safety and Accountability

- Avoid shortcuts that bypass verification
- Monitor for errors, delays, or missed tasks
- Adjust workflows based on staff feedback
  - We ask for feedback but don't take all suggestions; some are more feasible than others

Assessment Question #3

During a construction project, several automated medication distribution systems become partially unavailable. Describe how you would coordinate staff responsibilities and modify workflows to maintain patient safety and operational efficiency.

Assessment Question #4

What strategies can pharmacy leaders and frontline staff use to minimize operational challenges and staff frustration when automation systems are limited during construction projects?

Where are we now?

- Almost 3 months into being in the temp pharmacy
- Lessons learned:
  - Some staff adapted faster than others
  - Inventory counts were constantly off; cycle counts assignments were created and we cycle count three times per week
  - There were inconsistent processes when moving
    - This led to different assignments on each cart, created confusion and required re-work
  - Cleanroom operations have had the biggest adaptation
    - No HD room; have to split operations between main pharmacy and infusion pharmacy
- Next steps:
  - Preparation has begun for our move back to renovated pharmacy; targeted move back is Feb 2027.

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