Fully Automating the Inpatient Pharmacy

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Disclosure

Richard Capps reports no relevant financial relationships.

Greenville Hospital System
University Medical Center

Greenville Memorial Hospital
Pharmacy Operations

- Six satellite pharmacies supported by Central Pharmacy
- System-based pharmacy services:
  - SiemensRx® (Pharmacy information system)
  - Siemens Soarian® (CPOE)
  - Siemens MACe (BCMA)
  - ABTG RxWorks Suite®
  - Omnicell® Automated Dispensing Cabinets
  - Swisslog / RoverRx® (cart fill)
  - Alaris® smart pumps
  - Baxa EM 2400s / Abacus (centralized TPN production)
  - Holoni® (physician order imaging and workflow)

Objectives

1. Discuss the role of pharmacy technology and automation as part of a hospital medication distribution system.
2. Review the benefits of using bar codes as part of the dispensing process.

Technology

“A manner of accomplishing a task especially using technical processes, methods or knowledge.”
Pharmacy Automation

- “a mechanical device, operated electronically, that functions automatically, without continuous input from an operator.”

Automated Packaging

Why Automate?

Evidence-based Practices

Compelling Features of a Safe Medication-use System

1) Unit dose drug distribution
2) Protocols for high risk drugs
3) CPOE systems and decision support
4) Pharmacists in patient care areas/clinical rounds
5) Bar coding of unit of use medications
6) Counseling patients about their medications

Bar Code Verification

ASHP Statement on Bar-Code Verification During Inventory, Preparation, and Dispensing of Medications

- Conclusion: Prudent use of bar-code scanning in inventory management, dose preparation and packaging, and dispensing of medications can enhance patient safety and the quality of care.

BCAD

Medication Dispensing Errors and Potential Adverse Drug Events before and after Implementing Bar Code Technology in the Pharmacy

- Objective: To evaluate whether implementation of bar code technology reduced dispensing errors and potential ADEs.
Bar Code-Assisted Dispensing

- Results
  - 85% reduction of targeted dispensing errors.
    - Wrong medication reduced 56%.
    - Wrong strength / dose reduced 71%.
    - Wrong formulation reduced 90%.
  - 36% reduction in rate of all dispensing errors.


Workflow Management Software

- ABTG / RxWorks™ Workflow
- Swisslog / RoverRx® (Cart fill)
- Baxter / DoseEdge™ (IV workflow)

Workflow Management Software

- Predefined process
- Product verification
- Order status
- Auditable

ABTG / RxWorks® Workflow

- Inventory Management
- Dispensing
  - First Doses
  - Cabinet Replenishment
  - Cart-fill
  - Stock Requisitions

Inventory Management

- Electronic receiving
- Automated storage
- Perpetual inventory (select locations)
- Suggested orders

Electronic Receiving
Carousel Receiving

Automated Storage

Dispensing
- First Doses
- Cabinet Replenishment
- Cart-fill
- Stock Requisitions

Dispensing Process
1. Received into Workflow from the PIS
2. Routed to dispensing location
3. Picked / packaged
4. Staged for a pharmacist check
5. Dispensed by a pharmacist
6. Waiting for delivery / Tubed
7. Out for delivery / delivered

Workflow
Carousels

EXP – UD Packager

Pharmacist Check

Canister Replenishment

Pharmacist Check
Future Opportunities

- Product tracking systems
  - MedKeeper / MedBoard™
  - Aethon / MedEx™
  - RxWorks Suite
- Radio Frequency Identification (RFID)

Use of RFID Tags

RFID Asset Tracking

- Tracking smart pumps
- Monitoring equipment availability and inventory
- Loss prevention programs
- Tracking patients through perioperative services
Passive RFID Tracking

Pros
• Size
• Cost
• Single-use or Reusable

Cons
• Portal Technology
• Does not provide a real time location

Active RFID Tracking

Pros
• Real time location
• Uses WiFi network

Cons
• Size
• Cost
• Battery
• Accuracy

Final Thoughts

Technology-enabled practice: A vision statement by the ASHP Section of Pharmacy Informatics and Technology

"Obsolete Practice Model"

• Pharmacy practice, especially practice within the acute care setting, is largely unchanged from what it was 30 years ago.

Technology-enabled practice

“Alternative Practice Model”

- Such a model implies that pharmacists govern, but do not perform, actual preparation and distribution of medication doses.
- Automation must provide additional assurances that technicians have performed distribution tasks correctly and in an auditable fashion.

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