Re-Engineering the Pharmacy, Re-Energizing Patient Care

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Objectives
1. Discuss how one health-system utilized automation to increase the efficiency of the pharmacy department.
2. Review how technology can be a cornerstone for other clinical activities of an institution
3. Examine lessons learned when implementing technology and automation in a pharmacy department
4. Determine ways to assist pharmacists in being able to provide more clinical services

The Medical Center
- The Medical Center is a not-for-profit facility
- Located in south-central Kentucky
- Three acute care hospitals in Bowling Green, Scottsville, and Franklin with over 400 beds
- One long-term care facility and one long-term acute care facility – 138 beds
- Two community retail pharmacies

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Disclosure Statement

- Dr. Joyce does disclose that she is on the speaker’s bureau for McKesson Automation.
- The potential conflict was resolved through peer review of this presentation.

The Medical Center

- Over 2700 employees
- 300 physicians on staff
- Hospital offers a full range of services
  - Cardiac services
  - Oncology services
  - Obstetrical services
  - Neonatology
  - Behavioral Health services
  - Emergency services

Mission
To care for people and improve the quality of life in the communities we serve.

Vision
To be the leading integrated healthcare delivery system in South Central Kentucky and will be a major influence in reshaping healthcare.
Key Initiatives of the Hospital

- Proactive approach to Patient Safety
- Strong commitment for utilizing new technologies in order to continue to be the healthcare leader in region
- Focus on patient, physician, and staff satisfaction
- Utilization of resources

Identifying Risk Points in the Medication Use Process

- Errors occur at all phases of the medication use process
  - Prescribing (56%)  
  - Transcribing (6%)  
  - Dispensing (4%)  
  - Administering (34%)
- Know that the dispensing function can always be improved
- Lay groundwork and foundation for safer methods of prescribing and administering medications
**Pharmacist Involvement**

- Review all medication orders for:
  - Appropriateness of the drug, dose, frequency, and route of administration
  - Therapeutic duplication
  - Potential allergies or sensitivities
  - Potential impact of drug based on laboratory values
  - Contraindications
  - Formulary issues
- Drug information resource
- Monitoring medication use
- These activities were mainly occurring within the main pharmacy

**What Else is Happening in the Pharmacy?**

- Technicians are refilling automated dispensing cabinets (multiple times per day)
- First doses are being filled
- IV medications are being made
- Medications are being taken to the nursing units
- Medications that have been returned to the pharmacy are being credited and returned to stock
- Medications are being ordered from the wholesaler and shelves are restocked
- Questions are being answered

**Current Pharmacy Services**

- Provide pharmacy services to all facilities
  - Three acute care hospitals
  - One long-term care facility
  - One long-term acute care facility
- Open 24 hours per day
- 13 FTE pharmacists
  - One dedicated Clinical Pharmacy Coordinator
  - Three Pharmacist Managers for hospitals
  - One OR Pharmacist
- 22 FTE technicians
- Community pharmacy staffing is separate
Current Pharmacy Services
• Dispense an average of 202,000 doses per month for all facilities
• Utilize automated cabinet for dispensing with a profile system
  – No carts
  – Pharmacist must verify the medication order before the nurse can remove the medication for the patient
• Utilize Meditech for computer system
• Hospital is currently being retrofit for tube system

Current Nursing Services
• Average daily census is about 86% for all locations
• Two new patient care floors are under construction – open in 2010
  – Critical care – SICU
  – Dedicated orthopedic area
• All documentation is electronic in main inpatient areas
• eMAR – changed nursing and pharmacy workflow
• Ancillary areas, such as ED, Outpatient are still using paper for most documentation, although that should change by late fall

Pharmacy Issues
• Resources
  – Pharmacists
  – Technicians
  – Not only a shortage issue, but a productivity issue
  – Staffing patterns to allow enough pharmacists to provide clinical services on the nursing units
  – Greater demand for pharmacist services
    • “Pharmacy to dose”
    • “Pharmacy to educate”
    • “Pharmacy to evaluate”
  – Patient safety initiatives
Pharmacy Issues

• **Time**
  - More orders
  - More involved orders
  - More complex patients
  - New service lines and increases in existing service lines
    - Obstetrics
    - Neonatology
    - Chest pain accreditation
    - Stroke accreditation (pending)
    - Oncology
  - Meeting regulatory demands – TJC, CMS

Pharmacy Issues

• **Labor Intensive Tasks**
  - Many manual processes
  - Continual refilling of automated cabinets by the technicians
  - Pharmacist role in checking medications for the cabinets as well as other medications
  - Pharmacy and nursing unit checks for expired medications
  - Procurement of medications

Pharmacy Issues

• **Money**
  - Inventory in the automated cabinets
  - Number of automated cabinets
  - Expired medications

• **Future Plans**
  - Needed to have the right foundation
  - Bar-coding
  - Getting medications as close to the patients as possible
  - Having all medications together for one patient
  - Wanted pharmacist involvement for computerized physician order entry
Why Implement Central Pharmacy Automation?

- Robot
- Carousel
- Packaging Service

How Did We Get to This Solution?

- It Wasn’t Easy!
- Strategic planning for the department as well as for the hospitals
- Core team in place that looked at existing technologies, workflow, manpower and compared that to where we wanted to be
- Then, looked for gaps and how those gaps could be filled
  - Met with various vendors
  - Site visits
  - Best functionality within resource limitation

Pharmacy Reengineering Project had Four Main Goals:

- **Patient Safety**
  - Automated, bar-code based administration of medications
  - Direct pharmacist interventions on the nursing units

- **Productivity and Efficiency**
  - Utilize the staff to their fullest potential

- **Inventory**
  - Overall reduction in inventory

- **Leader in Healthcare**
Tangible Benefits of Central Automation

- **Centralized Inventory**
  - Reduced inventory in cabinets
  - Send patient-specific medications to the nursing units

- **Labor Intensive Activities**
  - Decreased pharmacist time checking
  - Decreased technician time refilling automated cabinets
  - Packaging service increased savings
    - By purchasing in bulk
    - Not a technician responsibility
  - Increased patient safety through the use of bar-coding in the main pharmacy

Quantifiable Benefits

Patient Safety and Productivity

- Reallocation of 1.5 FTE of pharmacist time for clinical activities outside of the main pharmacy
  - Pre-Implementation: 0.75 FTE
  - Post-Implementation: 2.25 FTE
- Dedicated Clinical Coordinator was no longer staffing
- Pharmacists were able to participate in several multi-disciplinary care groups regularly
- Increased education by pharmacists for certain medications
- Increased participation for nutrition support
Increased Pharmacist Clinical Intervention

Robot and carousel efficiency in medication distribution enables significant pharmacist’s time to be shifted from distribution and order entry to patient care working with physicians.

- Increases patient safety
- Improves drug cost efficiency
- Pharmacist job enrichment
- Elevates the Pharmacist within the patient care team

Patient Safety and Productivity

- Decreased technician time for refilling automated cabinets by 1 FTE
  - Pre-Implementation: 3 FTE
  - Post-Implementation: 2 FTE
- No staff were lost!!!
- Able to increase technicians in the IV room by 1 FTE without adding staff – needed due to increased activities associated with neonatology
- Technicians assist with some clinical activities
  - Looking at serum creatinine levels

Purchasing and Packaging Efficiencies

- A packaging service from the vendor was able to save money and time
- Purchase medications in bulk rather than unit-dose
  - Savings of over $55,000 per year
- Decreased technician time for packaging by 1.4 FTEs and pharmacist checking time by 0.4 FTEs
  - Pharmacist still must check the packaging service, but the time to check has been decreased
  - Process is also more streamlined and more efficient
Medication Inventory

Efficiencies

• Since the bedside barcoding project has been delayed, these efficiencies have not yet been realized but should occur
• Decrease inventory in the automated dispensing cabinets by 20%
  – Will stock only IV fluids, controlled substances, and PRN medications
• Decrease the number of automated dispensing cabinets
  – Reduce by one auxiliary cabinet and possibly two in some situations

Non-Quantifiable Benefits

• Elevating the role of the hospital Pharmacist
  – Job enrichment for the Pharmacist
  – Aids recruiting and retention of Pharmacists in a very competitive environment
• Reduces risk of major medical error
  – Decrease in potential litigation which is very important given that The Medical Center is self-insured
  – Conservatively have estimated that adverse drug events has decreased by 10%
• Key part of future projects
  – The pharmacy re-engineering project enables the desired future state of going to a 100% fully bar-code system for bedside medication. Without this project, gaining this capability would have required additional expenditures. This cost avoidance is not quantified in this analysis.

Challenges
Administrative Support

- Had to show that this was a "smart" project
  - Productivity
  - Financially
  - Patient Safety
- Had to be patient – this was not a quick process
- Continue to be diligent with changes in the market and within healthcare

Changing the Pharmacy Workflow

- Worry by the pharmacists about leaving their co-workers "stranded" if they were spending more time outside of the main pharmacy
- Developing procedures that work for all
  - Robot
    - What to keep in it
    - How much to keep in the Robot versus off-line inventory
  - Carousel – what to store
  - Packaging Service – use it efficiently
  - Where to store other medications

Changing the Pharmacy/ Nursing Workflow

- What to do with first doses
  - Part of the reason for the tube system
- When to fill and deliver patient-specific envelopes
- Where to store the envelopes once they are taken to the nursing units
- How to switch out envelopes from one day to the next
Renovation

- Pharmacy area was not sufficient to house robot, carousel, packaging operation
- Renovation had to be staged in order to allow the pharmacy to continue to function
- Required a lot of patience, dedication, and working in “less than optimal conditions” for a few months
Still working during the pharmacy renovation

Hmmm, this is pretty cool!

New, expanded, more open Pharmacy
Implementation Challenges

• Hybrid System with multiple vendors and interfaces
• Close working relationship with each company as well as hospital’s IT department
• Staff
  – Concern that the robot would take their jobs
  – New procedures
  – Training
  – Buy-in for success

Cost of Project
So, What Did All of This Cost?

- Equipment Costs: $1,473,294
  - Robot; Carousel;
  - Packaging Service
- Training and Installation: $108,235
- Construction Costs: $581,529
- TOTAL: $2,163,058

Financially Sound Project

- The financial implications of automating the Pharmacy were evaluated in detail
  - Project Net Present Value
  - Costs of the project compared to potential savings
  - Return on Investment
  - Cash Flow Projections
  - When savings could be realized
- Additional costs, such as renovation of the department were also evaluated

Team Decision

- Determine impact of decision on patient safety
- Need plan of where you want to go and what you want to accomplish
- Multidisciplinary approach to decision as well as implementation
- Carefully review processes to see how automation can enhance current as well as future activities
- Sound financial decision
Who Are the Key Players?

• Pharmacy
  – Support and buy-in from the beginning

• Finance
  – Start discussions with them early
  – Can help determine ROI, financing, budgetary impact

• Facilities
  – Especially if major renovation will be required

• IT
  – Help with necessary interfaces and equipment needs

Who Are the Key Players?

• Patient Safety Team
  – Risk Management
  – Medical staff

• Nursing
  – Will be an impact that is dependent on the level of automation

• Administration

Conclusions

• Specific benefit areas regarding labor productivity, material and supply productivity, asset efficiency and improved patient care have been identified

• It will be critical to monitor the benefit areas to quantify savings

• Teamwork among the Pharmacy, Physicians, Nurses and Finance along with a strong commitment to change management has resulted in an excellent project plan and business case with reasonable execution parameters
Next Steps

• Change to one vendor for automated dispensing cabinets
  – Efficiencies with one vendor
• Ready to go-live with the use of bar-coding for bedside administration and verification
  – Scheduled for this summer
• Computerized physician order entry
  – Limited activity scheduled for this summer

Next Steps

• Staff productivity
  – Continue to monitor
  – All hospital departments are expected to be at 25th percentile – pharmacy department at 10th percentile
• Quantify projected savings
  – Administration and finance want to know what efficiencies have been seen
• Continuity of care/ medication therapy management projects to positively impact the healthcare of our patients

Time for Your Questions

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1. The key initiatives of The Medical Center include:
   a. Proactive approach to Patient Safety
   b. Strong commitment for new technologies
   c. Focus on patient, physician, and staff satisfaction
   d. Efficient use of resources
   e. All of the above

2. Which of the following is not a critical pharmacy issue at The Medical Center
   a. Resources
   b. Time
   c. Labor intensive tasks
   d. Dropping census and market share

3. Tangible (quantifiable) benefits of central automation at The Medical Center include:
   a. Elevating the role of the pharmacist as part of the healthcare team
   b. Decrease in potential litigation due to decrease in medication errors
   c. Decrease in technician time in refilling automated dispensing cabinets
   d. Enhanced recruitment of pharmacists and technicians

4. The Medical Center has been able to increase pharmacist clinical services through the use of central automation.
   a. True
   b. False

5. Some of the challenges associated with the implementation of central automation at The Medical Center included:
   a. Changing the pharmacy workflow
   b. Space issues leading to renovation
   c. Dealing with multiple vendors and interfaces
   d. All of the above
   e. Only B and C