Waste Not; Want Not
Utilizing Lean Concepts to Reduce IV Waste

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We Welcome Your Questions

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- The content of this presentation was created by the presenters and does not necessarily reflect the views of Baxter Healthcare Corporation.
- Our speakers have accepted an honorarium from Baxter for this presentation.
About Our Speaker

Frank M. McCloy, R.Ph.

- Frank McCloy is the Sterile Products Supervisor at East Jefferson General Hospital (EJGH), a 435-bed hospital in Metairie, Louisiana.
- At EJGH, he is responsible for a $7.8 million sterile products budget. He is also in charge of the MD Anderson chemotherapy inpatient/outpatient pharmacy and USP 797 IV compliance.
- He has 20+ years of hospital pharmacy management experience.
- He has a record of accomplishment in operations management, inventory management, clinical program development, emergency preparedness, Joint Commission standards, USP 797 implementation, quality improvement methods, staff development and team building, pharmacy turnarounds/start-ups, project management, and cost control.

About Our Speaker

Donna Carbajal, RN, RRT, MBA

- Donna Carbajal is the Supervisor of Clinical Excellence and the Quality and Organizational Effectiveness Specialist at East Jefferson General Hospital (EJGH) in Metairie, Louisiana.
- At EJGH, her responsibilities include accountability for organizational wide direction and facilitation of performance assessment, reassessment, development and implementation of the Quality/Performance Improvement program in accordance with all regulatory requirements.
- She is involved in a number of quality and organizational activities at EJGH, including: FMEA, RCA, and performance improvement facilitation; JCAHO, CMS, and DHH preparation, survey facilitation, & remediation; patient and system tracers for regulatory compliance; peer review & medical staff committee support; incident review & sentinel event determination; and leadership, medical staff, board quality & lean performance improvement presentations and action plans.
Panelists

Frank McCloy and Donna Carbajal will be joined during the question and answer session by their colleagues on the EJGH LEAN Management Team:

Charlotte Williams, CPT  
Certified Pharmacy Technician  
East Jefferson General Hospital  
Metairie, Louisiana

Hai M. Nguyen, PharmD  
Dept. of Pharmacy  
East Jefferson General Hospital  
Metairie, Louisiana

Objectives

- Enhance IV room productivity and reduce IV waste while improving medication delivery to the nursing units.
- Demonstrate strategies resulting in a significant decrease in medication requests.
- Identify changes in the IV drug delivery preparation and delivery process that resulted in IV drug cost savings.
If you keep on doing what you have always done,
You will keep on getting what you’ve always got.

-Anonymous

**Lean**

- Things you should know about Lean:
  - Automation shouldn’t be the first answer
  - Lean takes a systems approach
  - Lean is team based
  - Lean is a system for the absolute elimination of waste

Lean

- Based on Toyota Production System
- Identification and elimination of WASTE in a process
- Got its name from MIT (James Womack)
- Improves Quality, Cost, Delivery, Safety, Morale
- Increases process capacity
- Reduces defects
- Results in a stable, reliable, repeatable, predictable process

3. Lean People. Lean Enterprise Institute: www.lean.org

Lean focuses on:
- Reducing the 7 wastes
- Improving process flow
- Increasing process speed

Lean

- Lean is about fixing the SYSTEM and transforming the CULTURE
- Lean is about FLOW
- Lean is about people, not just about improvement tools
- Lean is about YOUR expectations, what YOU are willing to tolerate in terms of Quality, Cost, Delivery, Safety, Morale
- Processes rarely get better on their own
- Successful processes have rules, standards, and absolutes
- To solve a problem you have to admit you have one
- Problems need to be quantitatively defined and their corrective action quantitatively tracked

Lean: Key Elements

- Standard work\textsuperscript{2}
  - The process of delivering care
    - Automation with a human touch
    - Make problems obvious
    - Immediate problem resolution
- User friendly
  - Provide the patient or staff what is needed, when it’s needed, in the quantity needed, on time, every time, 24/7/365
- Unobstructed throughput\textsuperscript{4}
  - Eliminating process constraints to increase throughput

A Lean Organization

Standard Work  User-Friendliness  Unobstructed Throughput


Jidoka
Making Problems Obvious

Standard Work  User-Friendliness  Unobstructed Throughput

A Lean Organization

Jidoka⁶ Making Problems Obvious
Kaizen² Continuous Improvement

Standard Work User-Friendliness Unobstructed Throughput

A Lean Organization

Jidoka: Making Problems Obvious
Kaizen: Continuous Improvement
Respect: For People
Heijunka: Just in Time

Standard Work User-Friendliness Unobstructed Throughput

Value Stream Focus

Jidoka: Making Problems Obvious
Kaizen: Continuous Improvement
Respect: For People
Heijunka: Just in Time

Standard Work User-Friendliness Unobstructed Throughput

References:
A Lean Organization

- Jidoka: Making Problems Obvious
- Kaizen: Continuous Improvement
- Respect: For People
- Heijunka: Just in Time

Standard Work | User-Friendliness | Unobstructed Throughput

Foster a culture that enhances individual creativity and teamwork, while honoring mutual trust and respect between staff and management.

- Acknowledge staff are the experts
- Include staff in Lean events
- Teach all staff to solve problems
Unobstructed Throughput

Unobstructed Throughput

ED  OR  Inpatient Unit

Continuous Flow

Waste (Muda)²

- Waste is any activity that:
  - The customer isn’t willing to pay for
  - Doesn’t positively change the form, fit, or function of the product or service (Value Added)

- Remember:
  - If you don’t have time to do it right, when will you have time to do it over?


The 7 Wastes

1. Overproduction
2. Inventory
3. Waiting
4. Motion
5. Transportation
6. Rework
7. Overprocessing

Step 1
Identify Customer Value


The Lean Process
The Lean Process

Step 1
Identify Customer Value

Step 2
Map the Process (Value Stream or Process Map)

Step 3
Determine capacity & customer demand
The Lean Process

Step 1 Identify Customer Value

Step 2 Map the Process (Value Stream or Process Map)

Step 3 Determine capacity & customer demand

Step 4 Identify & Eliminate Waste

Step 5 Adjust flow to customer demand. Eliminate disruption and abnormalities.
The Lean Process

Step 1 Identify Customer Value
Step 2 Map the Process (Value Stream or Process Map)
Step 3 Determine capacity & customer demand
Step 4 Identify & Eliminate Waste
Step 5 Adjust flow to customer demand, eliminate disruption and abnormalities
Step 6 Improve flow and continuously improve

Lean Organization

Pharmacy Kaizen
Sense of Urgency

- Pharmacy costs as a percentage of hospital expenditures increasing
- Waste reduction and financial stewardship of pharmacy resources a priority
- Pharmacy leadership in a position to optimize medication management by reducing non-value added process steps thereby positively impacting the hospital’s budget

Problem Statement

- A month-long study estimated annual IV waste costs at $750,000
- Opportunities related to:
  - rework
  - over processing
  - batching
  - lack of standard work
  - unnecessary motion
Key Issues Identified

- Piggybacks and large volume batched in 12hr time frames
- 400 drugs/month wasted
- Expired NS and D₂W 50 and 100 ml bags wasted due to lack of use prior to expiration date when stocked in each nursing units’ Pyxis dispensing cabinet
- Lack of point of care medication preparation resulting in waste due to expired piggybacks not utilized within established timeframe

Key Issues Identified

- Over 200 medication requests a day from nursing due to lack of standard work related to communication and IV delivery to nursing units
- Lack of standardized location for delivery and pick up of medications on nursing unit leading to duplication of IV remix
- Pharmacists are frustrated with multiple medication requests from nursing
- Nurses are frustrated with delayed medication delivery
Goals/Desired Outcomes

- Enhance IV room productivity
- Reduce IV waste while improving medication delivery to the nursing units
- Metrics:
  - Decrease medication requests by 25%
  - Decrease IV waste by 30%

The Team

- 4 Nurses from high usage units
- 2 Pharmacists
- 2 Pharmacy technicians
- Lean facilitator
Project Preparation

- Team preparation for the project
  - Team reviewed the medication request process from MD order through delivery to nurse
  - Representatives from four high volume medication request nursing units and four pharmacy representatives were selected to participate on team
  - Facilitator conducted a 2-hr JIT education session on Lean for team members on day 1 of the Kaizen
  - Kaizen was conducted in 8-hr day intervals over 2 wks for a total of 40 hours (3 days the 1st week; 2 days the 2nd week)
  - Established goals for the team

Current State Medication Process
Developing the Future State

After conducting a walk through and time observation study of Pharmacy Tech filling medications, the team used brainstorming to develop desired future state.
Future State Supporting Documentation

- Established a timeline for implementing recommendations and assignment/accountability for each action item
- Gantt chart of action items with responsible party

Expected Results

- Decrease medication requests by 25%
- Decrease IV waste by 30%
- Decrease return medications and associated labor by 30%
- Improve medication storage
- Improve timeliness of medication delivery
Sustainment

- Pharmacy will monitor:
  - IV waste
  - Medication Requests
- Nursing will monitor
  - Compliance with medication storage, intake, and return
  - Duplicate medication requests

Reflection

- Project reflection
  - Pharmacy and Nursing staff now appreciate the process steps required to complete a medication request.
  - Having Pharmacy and Nursing view each other’s processes allowed collaboration to make changes for the better.
  - Pharmacy and Nursing now have understanding of Lean concepts and recognize waste in their processes.
- Self-reflection
  - Collection of more baseline data prior to the meeting would have benefitted the team’s productivity.
Project Summary: A3

- Med requests delayed and/or duplicated

Analysis

- A 2009 week long study revealed we are wasting $750,000 in duplicate/expired/wasted IV medications. In addition, approx. 600 medication

Improvements

- 400 most commonly used drugs relocated closer to the pharmacy technician
  - Reduced steps and improved fill time
- Batches reduced from 12 to 3 hours for all piggybacks and LVPs
  - Created more nimble response to changes in orders and patient discharges
  - Resulted in reduced IV waste
Improvements

- Quick connect device placed on nursing units’ supply cart (Diltiazem, Vancomycin 1 g and Azithromycin) for small IV infusions
  - Rework reduction for pharmacists by eliminating the duplicate requests from nursing to fill an order already processed
  - Nursing administration delays reduced due to minimization of searching for a piggyback or requesting again from pharmacy

- NS and D5W 50 & 100 ml bags stocked on nursing supply cart as individually wrapped bags
  - Added longer shelf life reducing waste due to expiration of unwrapped bags prior to use
- Medication request queue created for Pharmacy Tech
  - Reduced redundant requests leading to potential duplication by Pharmacist
  - Allowed quicker response to nursing request
  - Reduced workload for pharmacist
Improvements

- Standardized pharmacy delivery and pick up locations on nursing units
  - Allowed quicker identification of delivered drugs
  - Reduced duplicate medication requests

- Thirty tubes from tube system painted blue
  - Visual cue
  - Enhanced prompt return to Pharmacy

Visual Signals: Blue tube identifies Pharmacy tubes to be returned to Pharmacy immediately to expedite delivery of meds to nurses.
Improvements Continued Post Kaizen

- To reduce IV bags and tubing waste, a new process was established for nurses to push IV ABX instead of using an IV pump.
- Sterile water needed as a nursing unit stock supply for IV medication dilution.

Kanban & Push vs Pull

- Kanban literally means “visual card”
- Kanban is a card, labeled container, computer order, or other device used to signal that more products are needed
- It creates a pull rather than a push system
- It uses Just in Time ordering to minimize stock outs

Current State

- Using IV piggyback and IV pump sets to deliver antibiotics in IV piggyback bags
- Wasting IV piggyback antibiotics due to delay in administration or delay in getting d/c to pharmacy

Future State

- RNs now pushing IV medications, when appropriate, eliminating wasted IV bags and tubing.
- Sterile water now stocked on each nurses station in a Kanban system to prevent stock outs. Nurses put Kanban card in pharmacy return box for restocking.
Two Bin Kanban

- Two bin Kanban
  - Calculate par levels, reorder quantity, & reorder time
  - Stock enough supplies to meet demand
- Standard Work
  - Pull supplies from top bin first
  - When top bin empty, replace with bottom bin
  - Place Kanban card in Pharmacy return box
  - Pharmacy tech picks up Kanban card & restocks

Responsibility

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<td>Pharm IV Supervisor</td>
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Results

- **March 2011:**
  - 71% reduction in medication requests and a 41% reduction in IV waste were realized
- **Since then:**
  - IV waste decreased from $62,500/month to $4000/month, a savings of $58,500/month
  - Mainly attributed to the reduction in IV batches from twelve to three hours
  - Utilization of quick connect adaptors allowing nurses access to medications using just in time philosophy

The shared understanding of the process between pharmacy and nursing has led to:

- Improved communication
- Teamwork as departmental silos are broken down to improve the medication process flow
Results

- Annualized 2011 IV waste
  - $48,000/year
  - 94% improvement when compared to the 2008 IV waste of $750,000/year:

  **Annual savings of $702,000**

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References


