Objectives:

- List the common tools of Lean methodology used to evaluate waste and improve efficiency
- Define steps to create a Lean culture in your pharmacy team
- Apply Lean concepts to problem-solving and how this can be used in your pharmacy department
Mass. Board of Pharmacy Policy


“Sterile compounding, complex non-sterile compounding, and institutional sterile compounding pharmacies shall ensure their employees are trained in lean concepts before renewing their pharmacy license. See M.G.L. c. 112, §§ 39G(a)(6), 39H(a)(6), and 39I(a)(7).”

Mass. Board of Pharmacy Policy

Effective December 31st, 2017

Pharmacist Manager of Record shall attest that their employees have been trained in Lean concepts per recently approved policy

http://www.mass.gov/eohhs/docs/dph/quality/boards/pharmacy/alerts/policy-2016-03.pdf
Mass. Board of Pharmacy Policy

- Individualized to each particular pharmacy practice setting
- Lean training should provide an understanding of:
  1. The definition of Lean concepts
  2. The concepts of waste and value
  3. The benefits of Lean in pharmacy
  4. The basic Lean principles and their use to improve pharmacy processes
  5. The use of the “5S” tools

What is Lean?

- A process improvement methodology focused on eliminating waste in process while increasing value for the customer
**Development of Lean Thinking**

- Term "lean" was created to describe Toyota's business during the 1980s by a research team headed by Jim Womack, Ph.D.

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**Evolution of Lean Thinking**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Focus on</td>
<td>Production cell and line</td>
<td>Shop-floor</td>
<td>Value stream</td>
</tr>
<tr>
<td>Approach</td>
<td>Highly prescriptive, using lean tools</td>
<td>Highly prescriptive, imitating lean organizations</td>
<td>Prescriptive, applying lean principles</td>
</tr>
<tr>
<td>Industry sector</td>
<td>Automotive—vehicle assembly</td>
<td>Automotive—vehicle and component assembly</td>
<td>Manufacturing in general—often focused on repetitive manufacturing</td>
</tr>
<tr>
<td>Typical activity in this phase</td>
<td>Application of JIT techniques, 5s, kaizen</td>
<td>Simulation of successful lean organizations training and promotion, TQM</td>
<td>Improving flow, process-based improvements, collaboration in the supply chain</td>
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<tr>
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<td>Improving customer value to improve organizational alignment, Decrease variability</td>
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</tbody>
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4 Fundamental Rules

- All activities should be highly standardized and specific
- Direct connection must occur between customer and supplier
- Products and services follow a simple, predetermined path
- Improvement efforts follow a scientific process

Lean in Healthcare

- Similarities to manufacturing, reliant on multiple complex processes
- Many processes and lots of waste
- Operating requirements continue to expand faster than operating budgets
- 20-30% of Healthcare spending is waste
  - Overtreatment of patients, failure to coordinate care, administrative complexities, etc.

Impact of Lean

<table>
<thead>
<tr>
<th>Industry Averages</th>
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<tbody>
<tr>
<td>Direct Labor/Productivity Improved</td>
<td>45-75%</td>
</tr>
<tr>
<td>Cost Reduced</td>
<td>25-55%</td>
</tr>
<tr>
<td>Throughput/Flow Increased</td>
<td>60-90%</td>
</tr>
<tr>
<td>Quality/Safety (Defect) Reduced</td>
<td>50-90%</td>
</tr>
<tr>
<td>Inventory Reduced</td>
<td>60-90%</td>
</tr>
<tr>
<td>Space Reduced</td>
<td>35-50%</td>
</tr>
<tr>
<td>Lead Time Reduced</td>
<td>50-90%</td>
</tr>
</tbody>
</table>
Lean in Pharmacy

- Turnaround time for all chemotherapy preparations decreased from 60 to 44 minutes
  - Using lean principles to improve outpatient adult infusion clinic chemo prep (Lamm M, AJHP 2015)
- Increasing the frequency of sterile product batches from 2 to 5 batches per day reduced rework and waste by 64%
  - Use of lean production to reduce waste in sterile compounding (Davis J, Hospital Pharmacy 2009)
- Cost saving of $289,256 due to waste reduction & improvements in workflow
  - Effect of lean process improvement techniques on a university hospital inpatient pharmacy (Hintzen B, AJHP 2009)

Lean: Operational Principles

1. Define Value
   - Define from the standpoint of the patient and customer

2. Identify the value stream
   - Something “flows”
   - Identify all steps in the process
   - Eliminate waste

3. Improve Flow
   - Identify value added steps

4. Establish Pull
   - Provide service only when needed

5. Strive for Excellence
   - Create value
   - Produce a consistent result each time

Value

- Determined by the "end" customer, in the case of healthcare, by the patient
  - No unnecessary delays in access to care, particularly no "scheduled waiting"
  - Accurate, consistent and satisfying outcomes
  - Flexible attention to need, change and expectations

Value-Added Activity
- Transforms patient, material, information, decisions, or risks
- AND the customer wants it
- AND it's done the right the first time

Needed Activity
- No value is created
- Cannot be eliminated based on current state of process, technology, or policy

Non-Value Added Activity (waste)
- Consumes resources but adds no value
- Process continues when activity removed

Waste

- Non-value adding activities
  - Mura: Unbalanced workflow
  - Muri: Overburdening people or equipment
  - Muda: Process steps that do not add value

Lean in Pharmacy: 8 Wastes

- Defects
- Overproduction
- Waiting
- Transportation
- Inventory
- Motion
- Lack of standardization
- Non-utilized talent
Identify the Value Stream

- **Process Maps**
  - Document the movement patterns (spaghetti diagrams) or workflows throughout a process
  - An organized visualization of all the interrelated activities

- **Value Stream Mapping**
  - Identify and eliminate the non-value added activities in each process step

**Spaghetti Diagram**


Powerful visual tool for seeing unnecessary movement
Value Stream Mapping

Process: Medication Stream (Chemo Prep)

Sort: Value-Added Activities (by Role)


Value Stream Map Equation

- Increase % Value and reduce % Waste
- Increase Throughput
- Lower Cost
- Improve Quality

Customer Pull in Pharmacy

- Batch refilling versus critical low refilling
- Can we control our work?

Leveling Workload

- Batch refilling of control substances to automatic dispensing cabinets
- Single-piece workflow based on stock low
Lean Tools: Problem Solve

- PDCA / PDSA
- Ishikawa (Cause-and-Effect) Diagram
- 5 Whys

PDSA cycles

- Useful tool when you understand why something is happening
- Develop a plan
- Test the plan (Do)
- Review the result (Study)
- Where many fail -
  - Act upon the results
PDSA cycles

- Plan
  - Review ADCs
- Do
  - Remove devices
- Study
  - Impact on service
- Act
  - No action needed


Ishikawa (Fishbone) Diagram

Source: Tufts Medical Center. Department of Pharmacy: Drug Selection Committee.
Lean Tools: Control Strategies

- To insure long term sustainability of process improvement and spread adoption
  - 5S
  - Standardized Work
  - Audit Tools

5S Methodology

- Five step methodology aimed at creating and maintaining an organized visual workplace

- This system aids in organizing, cleaning, developing, and sustaining a productive work environment
5S – IV Storage Area

- Sort → Set in Order → Shine → Standardize → Sustain


5S – Pediatric Vaccine Fridge

- Are your work areas organized?
- How do we sustain?

Standardized Work

- Documented description of methods, materials, tools, & processing times
  - Recipes
  - Checklists
  - Templates

Source: Tufts Medical Center. Master Formulation Record.
Standard Work Exercise

- Take 2 minutes and draw a football
- Share your drawing with the person next to you
  - Does it look the same or is there variation?
  - What contributes to your drawings looking different?
    - Skillset, memory, application, etc

Standard Work Exercise

- Take 2 minutes and draw a football
- Draw 2 lines from the left to right
  - Use the red dots on the paper to draw
- Draw 5 laces on the football
- Draw two lines at each of ball
  - Use the green dots on the paper to draw
Standard Work

- Do your team members know what to do at each workstation?
- Do you observe variation in the work being done at different workstations?
- Where does standard work supplement what exists in policies and procedures?
- Application to cross training

Lean Tools: Test Concepts

- Small tests of change offer quick simulations of change concepts
  - Waste Walk/Gemba
  - Kaizen Event

Lean Culture

- Requires cultural change of continuous improvement
- Emphasis on customer satisfaction, a clean, safe, and orderly environment as well as teamwork, cooperation in problem solving, and employee empowerment
Idea Board Systems

- Create opportunities for staff to share their ideas that leaders may not see
- Elimination of integrilin drips in from each cath room to central cath hall eliminated $42,000 in waste per year and 90% of waste eliminated

Idea Board Cards

- Everyone can identify a problem
- Train staff at all levels to think about root causes
  - 5 Whys
- Engage employee ideas
- Utilize PDSA cycles
How to make LEAN successful in your team

- A team that utilizes LEAN methodology effectively embraces the culture of transparency
- The culture must be open to new ideas and accept the question WHY?

Key Points

- Lean is a set of principles not just tools, and the application of these principles can improve pharmacy processes
- Tools of Lean can help you understand your systems, problem solve, improve efficiency, and add value
- The strive for excellence requires strong leadership and persistence over time