Lean Six Sigma in Health Care

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Objectives

- Pharmacist and Technician Objectives:
  - Discuss the present challenges in our healthcare system today
  - Discuss examples of the Lean Six Sigma specific to pharmacy
  - Identify options to implement Lean Six Sigma strategies
Anatomy of healthcare today

- The US population
  - Life expectancy - record high of 78.8 years in 2012
- Private vs public sector delivery of care
  - Patient care satisfaction
    - Efficiency
    - Access
    - Outcomes
- Since the year 2000
  - 91% of cost increases are due to
    - Price, professional services, drugs & devices, and administrative costs

Figure 8. National Health Expenditures (NHEs) by Patient Group, 2011

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>Population, in Millions (%)</th>
<th>National Health Expenditures, $, in Billions (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well</td>
<td>85 (27)</td>
<td>20 (1)</td>
</tr>
<tr>
<td>Acute self-limited conditions</td>
<td>82 (26)</td>
<td>412 (15)</td>
</tr>
<tr>
<td>Chronic conditions</td>
<td>144 (46)</td>
<td>2269 (84)</td>
</tr>
<tr>
<td>Total</td>
<td>311</td>
<td>2701</td>
</tr>
</tbody>
</table>
Expectations and Complexities

Health Care Services

Professional view
- Professionalism
- Autonomy
- Science and Technology

Societal view
- Measured effectiveness
- Access
- Cost

Consumer
- Prevention and Care
- Information and unbiased guidance
- Perceived value
Lean Six Sigma

- Manufacturing
  - Toyota Production System

- Waste *elimination* and *continuous* improvement

“At Toyota we get brilliant results from average people managing a brilliant process. Others get average results from brilliant people managing broken processes”
## Lean Six Sigma

<table>
<thead>
<tr>
<th>Lean</th>
<th>Six Sigma</th>
</tr>
</thead>
<tbody>
<tr>
<td>A way of thinking</td>
<td>Statistical term</td>
</tr>
<tr>
<td>Systematic approach</td>
<td>“Six Sigmas”</td>
</tr>
<tr>
<td>Identify and eliminate “waste”</td>
<td>3.4 defects per million opportunities</td>
</tr>
<tr>
<td>Improve flow of a process</td>
<td>Business tool</td>
</tr>
<tr>
<td>Engaging employees</td>
<td>Five phase approach to continuous improvement and problem solving</td>
</tr>
<tr>
<td>Never-ending</td>
<td></td>
</tr>
<tr>
<td>Customer-driven</td>
<td></td>
</tr>
</tbody>
</table>
Lean Six Sigma in Healthcare

- Organizations with goals to
  - Be competitive
  - Develop a cross-trained workforce
  - Establish safe workplace free of errors and process variation
  - Heal patients in a cost effective manner
Implementation - Lean Six Sigma Tools

• The transformation process
  ▫ Enablers are
    • Principled Leadership
    • People Focus
    • Policy Development
    • Practice Lean Sigma Tool Application
Critical/Clinical Features of Lean

• Prepare
• Assess
• Diagnosis
• Treat
• Prevent
Using Six Sigma Methodology to Reduce Patient Transfer Times from floor to Critical Care Beds

- **Objective:**
  - Reduce transfer time and establish a patient transfer process to effectively enhance communication between hospital care givers and improve the continuum of care for patient
- **714 bed tertiary care hospital**
  - Staten Island, New York
- **Results:**
  - Almost a 60% reduction in patient transfer time
### Methods

**Figure 1. High-Level Process Map (Define Phase)**

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Input</th>
<th>Process</th>
<th>Output</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attending Physician</td>
<td>Physician Order</td>
<td>Bed Management Notified of Transfer Request</td>
<td>Transport Order</td>
<td>Resident Patient</td>
</tr>
<tr>
<td>Unit Resident</td>
<td>Order with Correct Diagnosis</td>
<td>Bed Management Assigns Bed</td>
<td>Assigned Bed</td>
<td>Resident Patient</td>
</tr>
<tr>
<td>Nursing Unit</td>
<td>Nursing Report</td>
<td>Bed Management Notifies Receiving Unit &amp; Sending Unit</td>
<td>Faxed Report</td>
<td>Receiving Unit</td>
</tr>
<tr>
<td>Sending Unit</td>
<td>Faxed Report</td>
<td>Sending Unit Orders the Transfer</td>
<td>Completed Transport Order</td>
<td>Transport Dept. Patient</td>
</tr>
<tr>
<td>Transport</td>
<td>Transport Order</td>
<td>Patient Transferred to Unit</td>
<td>Completed Patient Transfer</td>
<td>Patient</td>
</tr>
</tbody>
</table>

*Start Point:* The moment Bed Management is notified of the transfer request

*End Point:* The moment Bed Management is notified that the patient is in the Critical Care Bed

**Supplier:** The person or organization who provides the inputs to your process.

**Input:** The materials, resources, and data required to execute your process.

**Process:** The series of steps or activities that uses one or more kinds of inputs and changes them to an output that is of value to the customer.

**Output:** The tangible products or services that result from the process.

**Customer:** The person or organization who receives the outputs of the process.
Methods

Figure 2. Root Cause Analysis as a Fishbone Diagram (Analyze Phase)

Fishbone
(Cause and Effect Diagram)

- **Measurement**
  - Utilization
  - Transfers
  - Discharges
  - Rounds
  - No beds available

- **Materials**
  - Order sheets
  - Teletracking reports
  - Chart documentation
  - Faxes
  - Bed vs. stretcher

- **People**
  - MDs
  - Nurses
  - Clerks
  - Bed management
  - Environmental services
  - Transporters

- **Process**
  - Chart misplaced
  - Chart not flagged
  - Orders not inputted
  - Unable to reach MD
  - Transporters not dispatched
  - RNs do not discharge patient

- **Environment**
  - Day shift
  - Night shift
  - Weekend day shift
  - Weekend night shift
  - 1, 2, or 3 bed transfer

- **Machines**
  - Fax machine
  - Printers
  - Phones
  - Tele monitors
  - Series computer system
  - Ventilator

Variation in Turn-around Time for Transferring Patients
Redesigning a Joint Replacement Program Using Lean Six Sigma in a Veterans Affairs Hospital

- Multidisciplinary team formed
- Verde Valley site visit
- June 2009
- July 2009
- August 2009
- September 2009
- October 2009
- November 2009
- December 2009
- January 2010
- February 2010
- March 2010
- April 2010
- May 2010
- June 2010
- July 2010

- Altered postoperative PT exercises
- SW joins team
- PT treatment room on orthopedic ward
- Mandatory preoperative class
- BID PT
- DC goals posted in patient rooms
- Orthopedic surgeon hired
- Placement No. 1 barrier to DC
- Patients with DC barriers to OR early in week
- Inpatient SW form adjusted for DC
- Project ends
Summary

• Lean Six Sigma is a process that strives for constant and continuous improvement
• “Waste” and value added activities are driven by a patient centered satisfaction
• Healthcare has seen improvements in efficiency and quality of care utilizing Lean techniques
• Effective implementation warrants a solid foundation of leadership to identify areas to improve with the entire team
References


• Hamilton Moses III, MD; David H. M. Matheson, MBA, JD; E. Ray Dorsey, MD, MBA; Benjamin P. George, MPH; David Sadoff, BA; Satoshi Yoshimura, PhD. The Anatomy of Health Care in the United States. JAMA. 2013;310(18):1947-1963. doi:10.1001/jama.2013.281425


• Todd Sperl, Rob Ptacek & Jayant Trewn. Practical Lean Six Sigma For Healthcare. 2013 MCS Media, Inc. Chelsea, MI.
Thank you!