Quality Improvement Tool Kit

Rick Beaver, BSc
Principal: Six Sigma Connections
Examiner: Baldrige National Board of Examiners

Disclosure Statement:
I do not have, and have not had, in the last 12 months, any relevant financial or other relationship with any proprietary entity producing health care goods or services including the manufacturer of any commercial product or device I will discuss during my presentation.
Abstract

- This session will address aspects of incorporating Quality Improvement in Patient Care Delivery and thereby improving Patient satisfaction and health outcomes.

- Participants will learn how to improve quality and efficiency at their institutions by using various proven methods such as Six-Sigma, Lean and Baldrige Performance Excellence criteria.

- The speaker will highlight lessons learned from his projects including clinical, process and financial impact of the various initiatives.

- Proven improvement methods are essential for the design and testing of clinical integration processes that contribute to the development of an Accountable Care Organization. The inclusion and engagement of physicians and nurses in the process design and testing phase is vital.
Learning Objectives

- Learn the steps to improve quality using tips from the Quality Improvement Tool Kit
- Learn to drive quality, safety and efficiency to the next level in any type of organization
- Provide attendees with examples for successful implementation
Agenda

- Overview and impact of Lean, Six Sigma and Baldrige Quality Improvement Tools
- The Tools of Lean Six Sigma and Baldrige
  - Organizational Improvement Tools
    - Deployment Model
    - Physician Engagement
  - Project Improvement Tools
    - Project Examples
  - Benefits of using an Organizational and Project Quality Tool Kit
- Summary
Lean is……

Doing a better job of delivering exactly what the customer wants…using fewer and fewer resources (equipment, time, inventory, people, paperwork, etc)

A simple concept, but a never ending process
Lean is……

- Maximizing **customer value** while minimizing waste.
- Creating more value for customers with fewer **resources**.
- Creating processes that
  - Need less human effort
  - Less space
  - Less capital
  - Less time
  - At a lower cost and with much fewer defects
- Optimizing the flow of products/patients and services through entire value streams
- Eliminating waste along entire value streams, instead of at isolated points
The Impact of Lean

- ½ the Human Effort
- ½ the Space
- ½ the Equipment
- ½ the Investment
- ½ the Engineering Hours
- ½ the New Product Development Time
- ½ the Waste
Six Sigma is……

In a narrow sense…
A metric based on the statistical measure called standard deviation

In a broader sense…
Seeks to improve the quality of process outputs by identifying and removing the causes of defects (errors) and variability to eliminate defects as defined by customers.

Reduce variation, Eliminate defects
S-Curve Philosophy

- Ad Hoc Improvement
- Continuous Improvement
- Do Nothing
- Deterioration
- Break Through
6σ and The Bell Curve

Asks the question “Do you know where your performance compares on the local, regional, state, national or international performance curve”?
The Impact of Six Sigma

• “A number of studies by institutions such as Harvard University and notable quality gurus Dr. Edward Deming and J.M. Juran estimate that a typical company suffers a 25% annual profit loss due to poor processes.

• Six Sigma provides the opportunity and the capability to reduce these annual losses.

• In the final analysis, Six Sigma results include:
  • More Capable Employees
  • Reduced Defects
  • Reduced Cycle Times
  • Lower Inventory Levels
  • Higher Efficiency and Lower Costs”
Insurance Services Division
Impact of Six Sigma

To continuously improve our products, programs, and services for our customers, we have instituted Six Sigma process improvement initiatives. Six Sigma projects were selected to improve and enhance quality of care, service and perception, financial and operating performance, and organizational growth and development. We estimate that these initiatives have achieved efficiencies totaling nearly $5 million per year, lowering our administrative costs and enhancing the value to our members. Nearly 60 staff members have participated in our Six Sigma Green Belt and Black Belt training programs.
### Lean Six Sigma vs. Traditional Quality Improvement

<table>
<thead>
<tr>
<th>Quality Improvement</th>
<th>Lean Six Sigma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driven <strong>Internally</strong></td>
<td>Focus is the <strong>Customer</strong></td>
</tr>
<tr>
<td>Focus is on moving the <strong>average</strong></td>
<td>Focus is on reducing variation relative to customer <strong>Specifications</strong></td>
</tr>
<tr>
<td>Focus on <strong>Outcomes</strong></td>
<td>Focuses on <strong>Processes</strong></td>
</tr>
<tr>
<td>Gains are <strong>transitory</strong></td>
<td>Gains are <strong>Sustained</strong></td>
</tr>
<tr>
<td>Is often separate from primary business of organization</td>
<td>Becomes “<strong>The way we work</strong>”</td>
</tr>
<tr>
<td>Measurement may not be integral to the initiative</td>
<td>Forces measurement prior to and after improvements</td>
</tr>
<tr>
<td>Improves <strong>quality</strong></td>
<td>Reduces <strong>variation</strong> and improves <strong>profitability</strong></td>
</tr>
</tbody>
</table>
Six Sigma and Lean

"There is an obvious case for the harmonious marriage between Six Sigma, which fixes individual processes, and Lean, which fixes the connections among processes."

Jay Arthur, the KnowWare® Man quoting Leaders of Toyota Manufacturing
Baldrige Performance Excellence Tools

- Baldrige refers to the Malcolm Baldrige National Quality Award, which the U.S. Congress legislated in 1987.
- Each year, applicants for the Baldrige Award prepare detailed assessments of their management systems. Their applications respond to the Criteria for Performance Excellence.
- There are seven Criteria Categories that cover everything important in a management system:
  1. **Leadership**
  2. **Strategic Planning**
  3. Customer Focus
  4. Measurement, Analysis, and Knowledge Management
  5. Workforce Focus
  6. Operations Focus
  7. Results
The Quality Tool Kit
Organization and Project Improvement Tools

- Performance Improvement Tools are used for:
  - Organization Strategic Planning
  - Project Selection and Definition
  - Project Leader Selection
  - Identification of Project Scope
  - For Project and Process Measurement, Analysis, Improvement and Control

Lean and Six Sigma are “Complimentary Tools and When Used Together Can Significantly Improve any Business or Clinical Process”
Organizational Improvement Tool Kit Examples
Lean Six Sigma and Baldrige Criteria for Performance Excellence

- Suppliers
- Board
- SMG
- Physicians
- Staff
- Customers

Strategic Planning Process

Opportunities Identified

Ranking of Opportunities vs. MVV

Sustained via Business “Circle of Life” and LSS Deployment Model

Application of Business Improvement Strategy
(i.e. Lean Six Sigma)

Measure/Analyze Process

Improvements Made

BALANCE SCORECARD
A Proven Deployment Model is Key to Success

This deployment model was proven successful at several organizations.
Benefit of a Deployment Model

- Provides positive ROI in year 1 and beyond
- Projects complete as training is completed using a stage gated approach to project management

- Helps establish a solid foundation for improvement in the organization
  - Provides support for project leaders
  - Provides an excellent process for project and student selection
  - Provides an outcome measurement system for organization project portfolio

- Provides a path to 100% project success rate
  - Impact on Organization Performance significant
  - Staff engagement and satisfaction significant
Alignment of Projects to Strategic Imperatives of Organization

- Provides a balanced project portfolio
- Ensures support of all aspects of the organization (IT, HR, $, Q, Growth/Community)
- Allows incorporation of a specific project set in the mix
- Project selection is a data driven approach, using FMEA tool, methods and prioritization
Tool: Ranking Matrix

- Apply to:
  - Project Selection
    - Critical point in selection of appropriate project set
  - Position Candidate Selection
    - Pick the right person for the position
  - Project Critical X Selection
    - Work on only the critical variables in a project
  - Solution Selection
    - Select the highest probability of success options
  - Top Project/Leader Success Selection
    - Identify highest impact projects
# Project Selection Ranking Matrix

## Organizational Initiative FMEA Ranking Form

<table>
<thead>
<tr>
<th>Impact on Imperative</th>
<th>Criterion Value Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Finance (x1000)</td>
</tr>
<tr>
<td>Very High Positive Impact</td>
<td>&gt; $750 = 1.00</td>
</tr>
<tr>
<td>High Positive Impact</td>
<td>$500-$750 = .75</td>
</tr>
<tr>
<td>Medium Positive Impact</td>
<td>$250-$500 = .50</td>
</tr>
<tr>
<td>Low Positive Impact</td>
<td>$100-$250 = .25</td>
</tr>
<tr>
<td>Very Low Positive Impact</td>
<td>&lt; $100 = .10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Projects</th>
<th>Finance Impact</th>
<th>Q Impact</th>
<th>HR Impact</th>
<th>IT Impact</th>
<th>Market</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED Service Line Profitability</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Patient Identification</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Redesign of Registration Area</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Reduce Waits/Delays for Convenient Care Services</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ED Redesign</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Room Service Implementation</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Overuse of Flash Sterilizer</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>HVHS MBA</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>
# Project Selection through Ranking

Apply Definitions to Each Criteria

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Improve the health status and quality of life of members and communities being served</td>
<td>Build the nation’s best health benefits and services companies</td>
<td>Increase integration, process and information quality/efficiency as well as technological capability</td>
<td>Expand human and organizational capabilities</td>
<td>Retain and increase membership, control expenses, and secure ongoing profitability</td>
<td>Leverage provider, academic, and industry relationships to create innovative approaches</td>
</tr>
<tr>
<td>Medium</td>
<td>e.g. significant improvement in one or more Hedis measures</td>
<td>e.g. significant increase in member satisfaction scores</td>
<td>e.g. significant advancement of internal performance or capability</td>
<td>e.g. significant advancement of human or organizational capabilities</td>
<td>e.g. $100,000 - $500,000 ROI</td>
<td>e.g. measurable impact in the area of industry transformation</td>
</tr>
<tr>
<td>Low</td>
<td>e.g. little or no improvement in one or more Hedis measures</td>
<td>e.g. little or no increase in member satisfaction scores</td>
<td>e.g. little or no advancement of internal performance or capability</td>
<td>e.g. little or no expansion of human or organizational capabilities</td>
<td>e.g. &lt; $100,000 ROI</td>
<td>e.g. little or no impact in the area of industry transformation</td>
</tr>
</tbody>
</table>
# Project Improvement Ideas

## Ranking Matrix

### Simplified FMEA Tool

<table>
<thead>
<tr>
<th>Variables Affecting Early (&gt;1 day additional) LOS</th>
<th>Rating</th>
<th>Impact on LOS</th>
<th>Ease of Change</th>
<th>RPN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Failure Rating: 5= highest, 1 = lowest
Values in shaded rows = Failure Rating X Solution Rating

**Process:** Discharge Planning Project: Reducing full days LOS
**Date of FMEA:** December 14, 2010
**FMEA Team:** Joann Hatton, Lori Guthrie, Matt Stevenson, Rick Beaver
## Ranking of Project and Team Performance

<table>
<thead>
<tr>
<th>Lean Six Sigma Project Set 2009</th>
<th>Use of Tools</th>
<th>Use of Process Data</th>
<th>Analysis to Improvemenl Logical</th>
<th>Achieved Objective</th>
<th>Plan will achieve objective</th>
<th>Innovation</th>
<th>Impact to Patient</th>
<th>Impact to Organizatiion</th>
<th>Use of Team Approach</th>
<th>Use of HVHS System Approach</th>
<th>Overall Score</th>
<th>Recommend for BB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergy Identification Process</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5.5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4.8</td>
<td>Yes</td>
</tr>
<tr>
<td>Physical Plant - Patient Rooms</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4.5</td>
<td>4.75</td>
<td>4.5</td>
<td>4.5</td>
<td>4.8</td>
<td>Yes</td>
</tr>
<tr>
<td>Central Line issues at Beaver and use of protocol (transferred 2 patients with femorals 15-18 days and prompt message)</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4.5</td>
<td>4.75</td>
<td>4.5</td>
<td>4.5</td>
<td>4.8</td>
<td>Yes</td>
</tr>
<tr>
<td>Intervascular device management</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4.5</td>
<td>4.75</td>
<td>4.5</td>
<td>4.5</td>
<td>4.8</td>
<td>Yes</td>
</tr>
<tr>
<td>Transition from paper medical record to increased usage of CAP</td>
<td>4.5</td>
<td>4.5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4.5</td>
<td>4.75</td>
<td>4.5</td>
<td>4.5</td>
<td>4.6</td>
<td>Yes</td>
</tr>
<tr>
<td>Pediatric Asthma Care</td>
<td>4.5</td>
<td>4.5</td>
<td>4.75</td>
<td>4</td>
<td>4.5</td>
<td>4</td>
<td>4.5</td>
<td>4.75</td>
<td>4.5</td>
<td>4.5</td>
<td>4.6</td>
<td>Yes</td>
</tr>
<tr>
<td>Insure Billing all Reimbursable MR Case Mana</td>
<td>5</td>
<td>4.25</td>
<td>4.75</td>
<td>4.25</td>
<td>4.25</td>
<td>4</td>
<td>4.5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4.8</td>
<td>Yes</td>
</tr>
<tr>
<td>Help Desk Purpose and Role</td>
<td>5</td>
<td>4.25</td>
<td>4.75</td>
<td>4.25</td>
<td>4.25</td>
<td>4</td>
<td>4.5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4.8</td>
<td>Yes</td>
</tr>
<tr>
<td>IPAC - staff trained to assist physician use of IPAC</td>
<td>4.5</td>
<td>3.75</td>
<td>4.5</td>
<td>4.25</td>
<td>4</td>
<td>4</td>
<td>4.25</td>
<td>4.75</td>
<td>4.75</td>
<td>4.75</td>
<td>4.3</td>
<td>Yes</td>
</tr>
<tr>
<td>Proactive Intervention with Bi-Polar Patients to Prevent E.D. Visits/Hospitalizations</td>
<td>4.25</td>
<td>4.25</td>
<td>4.25</td>
<td>4.25</td>
<td>4</td>
<td>4</td>
<td>4.75</td>
<td>4.25</td>
<td>4.75</td>
<td>4.75</td>
<td>4.3</td>
<td>Yes</td>
</tr>
<tr>
<td>Implementation of a scheduled face to face medication check process to reduce costly (un-billable) refill phone calls and increase attendance for Psychiatric (MD) appointments.</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4.5</td>
<td>4.5</td>
<td>3.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.5</td>
<td>4.3</td>
<td>Yes</td>
</tr>
</tbody>
</table>
# Ranking Matrix

## HR Candidate Ranking Matrix

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Fit with the Organization</th>
<th>Vision for Nursing</th>
<th>Knowledge of Nursing Practice</th>
<th>Nurse Leadership Experience</th>
<th>Mentoring</th>
<th>Leadership Style</th>
<th>Total Score</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary Example, R.N.</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>3000</td>
<td>Mary had significant leadership experience in leading projects in the implementation of the electronic medical record at her hospital and in the improvement of fall rate on her unit. On the other hand, Mary was limited due to only an associate degree and was unable to describe the 5 rights of nursing.</td>
</tr>
</tbody>
</table>
Appropriate Project SCOPE is a Key to Success

- Supports completion of projects within a specified time frame
- Supports achievement of strategic targets
- Supports the important organizational cultural objectives focused on employee satisfaction and engagement
Guidelines for Project Scope

- The impact of the project must be measurable in relation to our business goals
  - are data currently available?
  - it may be helpful to think of a project as the title of a graph which clearly shows improvement within a significant process

- Can the effort be completed within 6 months or less?

- Is the project overly complex from an organizational perspective?
  - from an IT perspective?

Scoped, Measurable, Achievable, Relative to Organization Goals and Time Bound to achieve your results
Guidelines for Project Scope

- Be specific about the process/service to:
  - Clearly state the aim of the project
  - Match resource requirements with the time frame and objectives of the project

<table>
<thead>
<tr>
<th>Project: too broadly scoped</th>
<th>Project: properly scoped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve turn-around-time for claims processing</td>
<td>Improve turn-round-time for paper claim submissions from PCPs within a newly expanded coverage area</td>
</tr>
<tr>
<td>Increase percentage of cases adhering to best-practice guidelines prior to surgery</td>
<td>Increase percentage of cases completing appropriate EMMI module prior to first time cardiac surgery</td>
</tr>
</tbody>
</table>
Project Template Tool Completed Prior to Start of Training and to Start of Project

Project Goal and Timing
Project Leader and Team
Project Champion
Business Need
Process Measures
Outcome Measures
Take Time in the Define Phase to Improve Your Probability of Success

<table>
<thead>
<tr>
<th>Project Leader (Student)</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Goal:</strong></td>
<td></td>
</tr>
<tr>
<td>Poor: Improve claims processing</td>
<td></td>
</tr>
<tr>
<td>Poor: Install ABC software to speed up processing of claims</td>
<td></td>
</tr>
<tr>
<td>Better: Reduce the average cycle time for processing (<em>type</em>) claims by 50% by August 30th, in order to improve customer satisfaction and reduce overtime expenses.</td>
<td></td>
</tr>
<tr>
<td><strong>Project Champion:</strong></td>
<td>Name</td>
</tr>
<tr>
<td></td>
<td>Title/Department</td>
</tr>
<tr>
<td><strong>Sponsoring Organization/Department:</strong></td>
<td>Department</td>
</tr>
</tbody>
</table>
## Business Need
### a.k.a. Elevator Speech

<table>
<thead>
<tr>
<th>Business Need for Improvement:</th>
<th>List the current issues driving a need for this project:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative profit margin for cataract surgery</td>
</tr>
<tr>
<td></td>
<td>High number of CLABs</td>
</tr>
<tr>
<td></td>
<td>Poor compliance to CMS P4P measures</td>
</tr>
<tr>
<td></td>
<td>High Bad Debt for emergency department patients</td>
</tr>
</tbody>
</table>

**HOW BIG IS THE PROBLEM?**
- We are leaving $500,000 on the table by not performing well on X Hedis Score
- If we don’t optimize this process we will have to add 20 FTE’s and 10,000 sqft of space to handle the 10,000 new members targeted in FY2014
# Measures and Projected Savings

| Process Measures:                 | # of Welcome Kits requested during the open enrollment period.  
|                                  | # of types of New Member Welcome Kits.  
|                                  | Timeframe of how long it takes for the Welcome Kit process to be completed from the development stage through distribution to the member. |
| Outcome Measures:                | Average # of days it takes a member to receive a Welcome Kit after the date they become effective.  
|                                  | # of member/ employer group complaints received by the Customer Service and Account Management departments regarding missing/incorrect welcome kits. |
| Estimated Financial Impact:      | Cost/time savings associated with development and distribution of Welcome kits = opportunity to reduce 900,000 of destroyed, color printed welcome kit items per year. (900,000 x cost per page to print + cost of warehouse space to store + transportation + destruction cost) |
Generate your process and outcome graphics early in your projects

Impact of Project on Reducing Number of FTE’s Needed to Manage New Members
Tool: Celebrate Successes

December, 2012 Six Sigma Project Celebration Event
# Celebrate Successes

<table>
<thead>
<tr>
<th>AWARD CATEGORY</th>
<th>STUDENT</th>
<th>PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational Excellence</td>
<td>Claudio Loffreda, MD</td>
<td>Central Line issues at Beaver and use of protocol</td>
</tr>
<tr>
<td></td>
<td>Lori McAninch</td>
<td>(transferred 2 patients with femorals 15-18 days and prompt message.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intervascular device management</td>
</tr>
<tr>
<td>Best Team Approach</td>
<td>Maria Rexroad</td>
<td>Pediatric Asthma Care Process</td>
</tr>
<tr>
<td></td>
<td>Susan Chaffee</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frank Palakovitch</td>
<td></td>
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<tr>
<td></td>
<td>Jeff Ginther</td>
<td></td>
</tr>
<tr>
<td>Best System Approach</td>
<td>Tina Wood</td>
<td>Transition from paper medical record to increased usage of CAP</td>
</tr>
<tr>
<td></td>
<td>Kathy Hudson</td>
<td></td>
</tr>
<tr>
<td>Fiscal Impact</td>
<td>Shane Bender</td>
<td>Physical Plant - Patient Rooms</td>
</tr>
<tr>
<td>Best Use of the 6-Sigma Tools</td>
<td>Bruno Mastoianii</td>
<td>Help Desk: Providing Computer Support</td>
</tr>
<tr>
<td>Impact on Patient Care</td>
<td>Amanda Ervin</td>
<td>Proactive Intervention with Bi-Polar Patients to Prevent E.D. Visits/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hospitalizations</td>
</tr>
<tr>
<td>Best Use of the Design 6-Sigma Tools</td>
<td>Dan Murphy</td>
<td>Diagnostic Center Marketing Policy and Process</td>
</tr>
<tr>
<td>Overall Outcomes after 6 months</td>
<td>Eric Ringer/Gina Watt</td>
<td>Outpatient Rehab Evaluation/Thorn Run Consolidation</td>
</tr>
<tr>
<td>Impact on Patient Safety In-Patient</td>
<td>Diane Eskra</td>
<td>Allergy Identification Process</td>
</tr>
<tr>
<td>Impact on Patient Safety Out-Patient</td>
<td>Leslie Canzano</td>
<td>Implementation of a scheduled face to face medication check process to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reduce costly (un-billable) refill phone calls and increase attendance</td>
</tr>
<tr>
<td>Innovation</td>
<td>Peggy Lang</td>
<td>for Psychiatric (MD) appointments.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Insure Billing all Reimbursable MR Case Management Units</td>
</tr>
</tbody>
</table>
Celebrate Successes

2009 Lean Six Sigma Operational Excellence Award

Presented to

Claudio Loffreda, M.D.
## Tool: Measure Training Effectiveness

<table>
<thead>
<tr>
<th>1. Default Section</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. Please rate the presentation quality of the materials provided (books, articles, class material binder)</td>
<td></td>
</tr>
<tr>
<td>Very Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>2. Please rate the technical content of the class materials provided</td>
<td></td>
</tr>
<tr>
<td>Very Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>3. Please rate the teaching approach of the instructor</td>
<td></td>
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<tr>
<td>Very Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>4. Please rate the effectiveness of the instructor in facilitating class interaction</td>
<td></td>
</tr>
<tr>
<td>Very Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>5. Please rate the ability of the instructor to guide you through the use of and understanding of the “tools” such as PFD, SIPOC, CE/CNX, VSM, FMEA, and graphical tools of SPC XL</td>
<td></td>
</tr>
<tr>
<td>Very Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Comment</td>
<td></td>
</tr>
<tr>
<td>6. Please rate how well your learning expectations were met</td>
<td></td>
</tr>
<tr>
<td>Very Poor</td>
<td>Poor</td>
</tr>
</tbody>
</table>
What we did well in presenting lean six sigma

1. I liked how the classes were spread over the different phases of the project.
2. Other past presenters with current presenters followed by instructor demonstration of the right way to use the tools
3. Engaging the class, having guest presenters with their finished project
4. I thought the instructor presented the tools in a manner that was easy to understand and use.
5. Concepts presented well
6. Very good explanation of what the expectations are of the students
7. Good job with explaining the tools.
8. Easy presentation
9. Individual presentations were helpful
10. Instructor very knowledgeable, allowed for positive discussion, accepted all thought and opinion constructively

Tool: Measure Training Effectiveness
How could we improve the delivery of Lean Six Sigma training

1. **Six sigma team available to support projects** in addition to having functional experts manage projects

2. **Our laptops should be loaded with the program prior to the first class**

3. I don’t feel there is anything that needs to be improved.

4. **Support theoretical with more group/hands on process.** Perhaps pick 1 project and work through it in class beginning to end by using the tools week after week. May be more meaningful to see how it comes together.

5. **Prepare students by giving them some information regarding Six Sigma prior to attending the first class so that the student is familiar with some of the terminology.**

6. **Class was very large** and I think that was challenging.

Critical factor is using the survey to improve the next training class, and so on……
**Tool: Physician Engagement**

- “Physicians must be satisfied with a healthcare organization or they will go elsewhere to practice.

- By providing an outstanding facility with the best operations, it can help you maintain a good staff of physicians.

- Lean Six Sigma promotes fewer physician complaints, reduced scheduling, and better working conditions.

- Clinical resource retention will increase as a result of improved processes.”
Physician Engagement

- Physicians, not administrators, present clinical project results at Medical Committees

- Physicians are project lead or mentor with PI liaison staff to support physician(s) during project

- Medical Clinical Quality committee
  - 1 negative vote is not a majority
  - Physicians representing each clinical specialty sit on MCQ committee
  - Outcomes of committee are carried to their respective committees
Training and Physician Engagement

Class Title: Lean Six Sigma for Physicians

Instructors: Chief Medical Officers and the VP Performance Improvement

Class Objectives:

• Following this activity, the participants should be able to:
  1. Discuss Lean Six Sigma concepts.
  2. Identify the role/effectiveness of Lean and Six Sigma in healthcare.
  3. Demonstrate the fundamental tools of Lean Six Sigma.
  4. Apply this methodology to a practice setting.
  5. Utilize Lean Six Sigma methods in clinical care.
  6. Understand the importance of Physician involvement and engagement in the clinical integration process.
Clinical Integration
Physician Project Leadership

• **C-difficile Reduction**
  • Gastroenterologists
  • Infectious Disease Control
  • Internal Medicine
  • External Research

  • Probiotics JAMA, Am Jrnl Gastro, Can Jrnl Gastro

  • Identified high dose, double blinded study with 85%+ reduction in cdiff
Clinical Integration
Physician Project Leadership

- **Readmissions**
  - SNF physicians
  - SNF administrators and staff
  - LTAC staff
  - Payor supplied NP’s
  - PCP to support office visit
Clinical Integration
Physician Project Leadership

- Stroke Center Certification
  - CMO, CMQO, Neurologists, ED Physicians, PCP’s, Radiologists
  - Automated call to Stroke Team mimicking cath lab team process
  - Prescribed process for managing stroke patient from patient arrival to discharge
    - ED, Radiology, Lab sequencing, timing and reporting
Project Success Rate

- By incorporating the Organizational Improvement Tools just discussed, project success rate increases dramatically.

- Tools discussed include:
  - Project Ranking, Scoping and Selection
  - Project Define Template
  - Improvement Methodology Deployment Model
  - Baldrige Strategic Planning Model
  - Stage Gated Project Presentations
  - Projects Progress In Tandem With Training
  - Ranking and Evaluation of Project Outcomes
  - Evaluate How Your Process Compares to the “Bell Curve”
## Importance of Appropriate Application of ORGANIZATIONAL Improvement Tools

### Reasons For Project Failure

<table>
<thead>
<tr>
<th>Root Cause</th>
<th>Contributing Cause</th>
<th>Fatal Flaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader Attrition</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>Sr Leader Barrier Busting</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Project Leadership</strong></td>
<td><strong>60%</strong></td>
<td><strong>20%</strong></td>
</tr>
<tr>
<td>Poor VOC</td>
<td>60%</td>
<td>0%</td>
</tr>
<tr>
<td>Poor Project Definition</td>
<td>60%</td>
<td>20%</td>
</tr>
<tr>
<td>Project Scope (Too Big; Control)</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>Poor Data Collection &amp; Analysis</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>Improve Strategies Failed</td>
<td>20%</td>
<td>0%</td>
</tr>
</tbody>
</table>

By spending the right amount of time in the define phase you can prevent 70% of the reasons for project failure.
Areas to Apply Quality Tool Kit

- All departments
- All industries
- Teaching diverse companies or specialties side by side
  - Example Healthcare next to auto mirror mfg
  - Example Healthcare next to defense contractor
  - Local municipality applying tools to improve repair of road surfaces
  - Pharmaceutical distribution and warehousing
  - Surgical team working on inventory control
Project Improvement Tool Kit Examples
“One day on the floor is equal to 30 days in your office”

Staple Yourself to an Order
by Benson P. Shapiro, V. Kasturi Rangan, and

A typical CEO woos clients on the golf course or at meetings devoted to high-level questions. Here’s a better idea: Re-create the client’s experience by following an order through your own plant.

The TEAM should walk the process to experience the pain and delay that exists in all work flow
Optimizing Behavior Change in the Healthcare Setting
Include and Engage Physicians

- Applies to the design of an Accountable Care Organization
- Applies to clinical integration through a health system
- Physician project leader
  - “Support Behavior Change of Patients”
  - Physicians trained to treat “impact of patient lifestyle”
- Physicians partner to prescribe lifestyle change and refer to health coaching.

Baldrige Principle of Including Your Partners and Suppliers in Performance Improvement
Company estimates that a 10% reduction in the rate of smoking and level of obesity among their employees would save the organization $12.2 million in medical and pharmacy cost.
Optimizing Behavior Change in the Healthcare Setting

**New Order**

<table>
<thead>
<tr>
<th>Associated Diagnosis Code</th>
<th>Associated Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>10000</td>
<td>Erroneous Encounter</td>
</tr>
</tbody>
</table>

**Comments**

Your doctor has ordered a prescription for making healthy lifestyle changes and notified a health coach to assist you in improving your health and medical condition. The top areas of concern indicated by your doctor are:

- Weight Management
- Tobacco Cessation

Your doctor will be following your progress and will be receiving frequent updates. Please provide a progress update at:

Your next scheduled visit
## Optimizing Behavior Change in the Healthcare Setting

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Tobacco Success Rate (quit at 30 days post)</th>
<th>Weight Success Rate (&gt;=5% wt loss at 30 days post)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Pilot (5/1/09-11/30/11)</td>
<td>3%</td>
<td>10%</td>
</tr>
<tr>
<td>Pilot Review/Internal Interventions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot Review/Internal Interventions (12/1/11-10/31/12)</td>
<td>4%*</td>
<td>7%*</td>
</tr>
<tr>
<td>Six Sigma intervention period (11/1/12-10/31/13)</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Best Practice Outcomes in Literature to Date (6 months post)</td>
<td>27-30%**</td>
<td>46-53%3**</td>
</tr>
</tbody>
</table>

Compare yourself to the bell curve performance
Volume of Claims Line Reprocessing
Decrease the size of your “Hidden Factory”

- Addresses back office processes
- Exposes excess cost of operations

PROJECT
- Approximately 1.0 million claim lines reprocessed annually
- Target: 20% reduction in reprocessing, cost savings of $390 K
- After interventions, the number of reprocessed claim lines reduced by approximately 40%
- Cost savings of $750 K was recognized
Claims Lines Reprocessing
Pre/Post Intervention - CPK

<table>
<thead>
<tr>
<th></th>
<th>Sigma Level</th>
<th>DPMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Intervention</td>
<td>0.0023</td>
<td>499,081</td>
</tr>
<tr>
<td>Post Intervention</td>
<td>2.1124</td>
<td>17,325</td>
</tr>
</tbody>
</table>

**Pre Intervention**
- Mean = 4.8984
- StdDev = 2215.04
- USL = 10
- LSL is not defined
- Sigma Level = 0.0023
- Sigma Capability = 1.5023
- Cp = 0.0008
- Cp is not available
- DPMO = 499,081
- N = 817915

**Post Intervention**
- Mean = 2.5967
- StdDev = 3.5047
- USL = 10
- LSL is not defined
- Sigma Level = 2.1124
- Sigma Capability = 3.6124
- Cp = 0.7041
- Cp is not available
- DPMO = 17,325
- N = 498927
Reduction of Postage/Shipping Cost
Project Scope and Goal

• Project Scope
  • To reduce variation in freight costs and process associated with the fulfillment of POD/NONPOD materials via workflow vendor

• Project Goal
  • To reduce postage freight cost 30% by restricting shipping options by June 1 and reduce order volume 10% by eliminating phone orders by July 1.
Reduction of Postage/Shipping Cost

Interventions

- Eliminated phone orders
  - Ad hoc orders now entered in workflow commerce website for tracking
- Applied vendor codes to workflow third party suppliers
- Developed a new reporting process to monitor all freight expenditures and capture erroneous charges

- REPRESENTS COMPANY HIDDEN FACTORY
  - Back office operations
  - Any type of company
  - Offset decreases in care reimbursement
  - Maintain or grow profit margins
  - Companies can have 40% of cost as hidden, unneeded cost
Reduction of Postage/Shipping Cost

Financial Impact

POD Average Monthly Freight Charges

$42,682.23

$7,435.13
Reduction of Postage/Shipping Cost

Financial Impact

- Savings represent an 83% reduction compared to baseline

- Received a $61,976 Freight Credit for inappropriate shipping charges as a result of the project

- Annual projected savings are ~ $484,941
Cataract Surgery

Surgeons Supported Project by:

- Discussing Technique Differences for Eye Anesthesia
- Pre-Scripting Medications
- Eliminated Pre-Admission Testing on Topical Anesthesia Cases
- Common Supplies Accepted
  - Types of Ophthalmic Solutions
  - Keratomes and Knife Preferences
  - Drapes
  - Custom Packs
  - Lens Supplier

Improved Profit Margin from \(-16\%\) to \(+7\%\)
Customer Satisfaction to Over 90%

44\% Variation in Supply Cost
Cardiac Marker Turn-Around-Time
Laboratory to Emergency Department

- Perform STAT cardiac marker testing with a target turnaround time (TAT) of one hour or less
  - The TAT is defined as the time from blood collection to the reporting of results\(^3\).
    - National Academy of Clinical Biochemistry (NACB)

- Collaborative participants reported 90% of cardiac marker results reported in 92 minutes (bell curve positioning)
  - This result did not meet the expectations of providers nor the users of these tests.”
    - Archives of Pathology and Laboratory Medicine: Vol. 128, No.2, pp.158-164.
Cardiac Marker Turn-Around-Time
Laboratory to Emergency Department

At Project Start:

- Total Troponin’s from E.D.: 704
- Average TAT: 45 min
- 95% TAT: 74 min
- Outliers >60 min: 82 \( \sigma \) cap. 2.7
- Outliers >90 min: 21 \( \sigma \) cap. 3.4
- *Avg. order to receipt time: 22 min
Cardiac Marker Turn-Around-Time
Laboratory to Emergency Department
95% Chemistry TAT Tests
Cardiac Marker Turn-Around-Time
Laboratory to Emergency Department
Average Chemistry TAT Tests

Implementation

TAT (Minutes)

CPK
CKMB
TROPI
BMP
CNP

JUNE JULY AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV
**Central Line Infection Prevention**

**Femoral Lines Inserted by Date and Time**

Education to IV Therapy staff and CCU staff on line management and removal within 48 hours. Daily assessment of line necessity by CCU RN's and IVT RN's, consistent collaboration with MD's promote line removal.

<table>
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<th>Factor B</th>
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<tr>
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<td>6/8</td>
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**F Test Analysis (Std Dev)**

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<th>Factor A</th>
<th>Factor B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor A</td>
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<td>0.0</td>
</tr>
<tr>
<td>Factor B</td>
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</tbody>
</table>

**Mean**

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<tr>
<th></th>
<th>Factor A</th>
<th>Factor B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>118.295</td>
<td>58.958</td>
</tr>
<tr>
<td>StDev</td>
<td>145.365</td>
<td>40.933</td>
</tr>
<tr>
<td>Count</td>
<td>41</td>
<td>37</td>
</tr>
</tbody>
</table>

**Summary**

T & F tests demonstrate statistical significance with Mean and Standard Deviation

<table>
<thead>
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<td>37</td>
</tr>
</tbody>
</table>

**t Test Analysis (Mean)**

<table>
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<tbody>
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</tr>
<tr>
<td>Count</td>
<td>41</td>
</tr>
</tbody>
</table>
Pharmacy Inventory Analysis

Opportunity Identification

Two-thirds of total inventory held in back up.

Duplicate Inventory

- **Back Up Inventory**: $39,474.78
- **Work Area Dollars**: $20,809.68

Dollars

- $0.00
- $10,000.00
- $20,000.00
- $30,000.00
- $40,000.00
- $50,000.00
- $60,000.00
- $70,000.00

A
Pharmacy Inventory Analysis
Future State - Concept One

Future State 1

Pharmacist review
- located in the area
- Updates E Marr

Doctors Order
- Physician enters order in computer

Electronic MAR

Administration
- Nurse scans patient/med
- Gives to patient

Patient

Supplier

Supermarket
Increasing technology does not necessarily streamline processes.
Benefits of Using the Operational and Project Tool Kit

- A sustained deployment of Lean Six Sigma in any organization
  - 12 years of deployment at the Health System
  - Beginning 6th year of deployment at the Health Plan
  - Sustained 7 year deployment in Pharmaceutical company
  - National data shows 20 to 40% successful deployment of improvement strategies
Benefits of Using the Operational and Project Tool Kit

- Project success rate > 90%
  - Success achieved on 26 of 28 projects in 2010 at a health system
  - Success achieved on 92% of projects at a health plan through 2011
- National data shows average of 20 to 50% project success rate
Benefits of Using the Operational and Project Tool Kit

- Recognition for Organization and Project Team
  
- Of 26 projects mentioned on previous slide, 5 projects received external awards for their efforts

- Developed internal recognition and award process for high impact projects and teams
Proactive protocol (Quality--Winner)

System puts focus on bipolar prevention

By Ed Finkel
Posted: December 13, 2010 - 12:01 am ET
Tags: Quality, Special Feature, Spirit of Excellence

Since July 2009, emergency department visits have decreased 40%, inpatient admissions by 62% and total inpatient days by 71% among bipolar patients seen through Heritage Valley Health System's Staunton Clinic for behavioral health, in Moon Township, Pa.

To be more proactive in treating these patients, given their propensity to quickly deteriorate when early warning signs aren't recognized, the clinic instituted a system for preventing full-blown relapses. The dramatic results since the clinic's Intensive Service Coordinator implemented its methodology have garnered Heritage Valley the Spirit of Excellence Award for Quality.

“If they get ill and hospitalized, it’s a major setback to the person’s functioning level,” says Michael Slovacek, service unit director. “If you can divert the person and keep them from reaching that acute level of need to be hospitalized, their recovery is more likely to be on a steady course, with much less disruption in functioning.”
Proactive Treatment of Bi-polar Patients

**Emergency Department Visits**
- Baseline: 20
- Post-Intervention: 12
- 40% Decrease
- GOAL: 18*

**Inpatient Lengths of Stay**
- Baseline: 233
- Post-Intervention: 68
- 71% Decrease
- GOAL: 210*

**Inpatient Hospitalizations**
- Baseline: 24
- Post-Intervention: 9
- 62% Decrease
- GOAL: 22*
Six Sigma Approach to Reducing Vesicant Drug Extravasations

Heritage Valley Health System has significantly reduced the number of intravenous vesicant drug extravasations by 84% by implementing an early vascular assessment program to determine the appropriate line for infusion of vesicant drugs. An extravasation is defined as the leakage of intravenous drugs from the vein into the surrounding tissue. A vesicant is an agent that has the potential to cause blistering or tissue necrosis. Extravasation injury refers to the damage caused by leaking of solutions from the vein to the surrounding tissue spaces during intravenous administration. Once an extravasation has occurred, damage can continue for months and involve nerves, tendons and joints. If treatment is delayed, surgical debridement, skin grafting, and even amputation may be the unfortunate consequences.
Reduction of Drug Extravasations

# Extravasations
Goal: Reduce IV Extravasations by 50%

IV Drug Extravasations
January 2006 through December 2008

Improved Event Reporting

84% Reduction in Number of IV Drug Extravasations
Jan 2006 - Jan 2008

Overall Process Improvement
Sustained 67% Improvement

Reduced the mean from the time the vesicant drug was ordered to the time of early vascular assessment from 4.5 days to 1.3 days.

t Test (mean) P Value = 0.000 (significant)
P Test (variation) P Value = 0.000 (significant)
Tool: Lean Application to Laboratory Operations

National Recognition by Laboratory Association

- Tools Utilized on this project:
  - Spaghetti diagram
  - Single piece flow
  - Value Stream Map
  - CpK Analysis
- Improvement of critical item TAT
- Improve speed of ER diagnosis and treatment
- Applications to stroke, Heart Failure care etc
Lean Lab Design
Maximizing the Use of Laboratory Automation

- The lab is responsible for 1.2 million billable tests annually
- Employs 95 full time equivalent positions.
- Speed and accuracy of test results directly affects the patient’s length of stay.
- Identified need to replace aging Chemistry instruments.
- Opportunity to not only acquire new equipment, but to
  - re-examine the lab processes
  - identify inefficiencies and storage of laboratory tests and specimens.
- Targeted creating more value with fewer resources
Batch and wait steps were identified at… Specimen receipt, registration, specimen labeling, centrifugation, tube lounge, and analyzer.
Preparation for FIFO/Single Piece
• Automated line installed (samples are automatically centrifuged, uncapped, aliquoted, transported to testing instrument)
• Pneumatic tube moved closer to automation input
• Registration area moved closer to specimen receipt and automation input
Lean Lab Design - Fewer Process Steps

OUT-PATIENT PROCESSING

Arrive via courier

Heme/Coag receive in LIS

Order entry

Print/apply labels

Wand into computer

NO

YES

Carry to processing

Match tubes to slip

Place in rack

Color code rack/slips

ANALYTICAL SECTION - CHEM

Load tubes

6 minute spin

YES

NO

Place in rack

Load analyzer and begin run

Transfer specimens to generic racks

Unload analyzer

Cover and store in local fridge

Transfer to cold storage

Manual review of results

OK?

Data release

Repetitive process sort to workstation

Load instrument rack

Rerun process

Add-on process

Further testing?

YES

NO

66% reduction in steps!

IN-PATIENT PROCESSING

Arrive via tube system

NO

Receive in LIS

Order entry

Print/apply labels

Wand in

YES

Sort

Chem

Heme/Coag

Fix tube caps

ADD ON PROCESS

Office gets call

Make out slip

Deliver to basket

Work today?

Look in LIS

Correct tube type?

Add on in LIS

Find tube

Label tube

Place in rack

NO

YES

YES

NO

G1

H

G

D1

ALIQUOTING

Get AL label

Decap primary tube

Label daughter tube

Prepare daughter tube

D1

AL

specimens labeled?

SPECIMEN PREP

Balance tubes

Aliquot?

YES

Transport

D

E

NO

NO

YES

G

H

E

D1

Heme/Coag

process?

YES

NO

STAT?

Expedite

NO

YES

PROCESS WAIT STATES

BIOHAZARD EXPOSURE

MEDICAL MISTAKES

REPETITIVE MOTION
Lean Lab Design
Maximizing the Use of Laboratory Automation

Figure 1: Chemistry Turn-around Times, Pre-Redesign

Figure 2: Chemistry Turn-around Times, Post-Redesign
Lean Lab Design: Single Piece Flow

Cycle Time
The movement from batch processing to single piece, first-in-first-out processing actually reduced the time it was taking to complete analysis on samples. Figure 3 shows that under batch processing the first sample that took 61 minutes to be processed while under single piece processing, figure 4, the first sample was complete within 25 minutes. And at 61 minutes, eight were completed.
Lean Lab Design: FTE Productivity

Productivity
To measure impact that automation had on productivity, the team measured the units of service per full time equivalent (FTE) employee. Figure X shows that in FY2006, each FTE handled 11,632 units of service. After automation, the units of service each FTE handled increased by 19.2% to 13,866, as shown in figure 5.

Figure 5: Productivity, Units of Service per Full-time Equivalent

<table>
<thead>
<tr>
<th>UOS/FTE</th>
<th>11,632</th>
<th>12,151</th>
<th>13,014</th>
<th>13,640</th>
<th>13,866</th>
</tr>
</thead>
</table>

89
PA Healthcare Engineering Society Award

Hospital Room Renovation Cost Reduction

Cost Per Room Renovated

- Contractor Complete Renovation
  - Cen = $12,944
  - UCL = 13223.98
  - LCL = 12756.92

- Construction Crew Room + Contractor Bathroom
  - Cen = $8,515
  - UCL = 9556.3

Measures and Projected Savings

<table>
<thead>
<tr>
<th>Possible Process Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cost of Labor</td>
</tr>
<tr>
<td>- Cost of Materials</td>
</tr>
<tr>
<td>- Press Gainey Scores Increasing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expected Outcome Measures:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cost per room coming in less than 50% of sub price</td>
</tr>
<tr>
<td>- Turn around time coming in at 5-8 days per room depending on problems encountered.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Savings ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price to complete 102 rooms in a fiscal year with subcontractor $1,324,980. Price to do 102 rooms in house $658,000. Cost savings is estimated at $667,000.</td>
</tr>
</tbody>
</table>

Actual Savings on 102 Rooms = $765,204
PA Healthcare Engineering Society Award
Hospital Room Renovation Cost Reduction

Contractor Complete Renovation
Internal Crew Room Contractor Bathroom Renovation
Internal Crew Renovation

Sigma Level = -
70  DPM = 1,000,000

Sigma Level = -
1.0  DPM = 848,525

Sigma Level = 11.0  DPM = .00000000
Sustaining Gains

- Tool: Control Plan
  - Continue to measure improved processes after project closure
  - Data collection decreases as performance is sustained
  - Incorporate strategic project outcomes into the organization balanced scorecard
Help sustain the positive **ROI** experienced in year 1, 2, 3 and beyond

- ROI is not only represented in $’s.
  - $’s gained are secondary outcomes to many process improvements
- ROI also refers to:
  - Expanding # of lives covered without adding FTE’s
  - Expanding # of lives covered without adding space
  - Reduction in paper, time, calls, handling steps
  - Prevention of patient readmissions
  - Prevention of hospital acquired infections
  - Maximized revenue with appropriate application of rules
  - Eliminate steps, processes,
- Controller Verified Gains
Quality Tool Kit Summary

- **Organizational Tools** for Improvement Success
  - Project Ranking, Scoping and Selection
  - Project Define Template
  - Improvement Methodology Deployment Model
  - Baldrige Strategic Planning Model
  - Engagement of Physicians in Planning and Project Execution
  - Stage Gated Project Presentations
  - Projects Progress In Tandem With Training
  - Ranking and Evaluation of Class
  - Ranking and Evaluation of Project Outcomes
  - Celebration of Success
  - Award Applications (Internal and External)
  - Evaluate How Your Process Compares to the “Bell Curve”
Quality Tool Kit Summary

- **Project Tools** for Improvement Success
  - FMEA
  - Value Stream Mapping
  - Control Charts
  - Cpk Analysis
  - Spaghetti Diagrams
  - Current and Future State Maps
  - F-test and T-test
  - Trend Charts
  - Scatter Diagrams
  - Process Walk (Staple Yourself to a Process)
  - + many more……
Organizational and Project Tool Kit

When a company deploys an improvement strategy, the combination of Organizational Improvement Tools and Project Improvement Tools significantly increases the probability of project, project leader and organization success.
Questions or Comments

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