Lean Six Sigma Tools in Behavioral Healthcare

2013 CBHC FALL CONFERENCE
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Objectives:

- Learn to apply lean six sigma tools to improve service quality, work flow, and outcomes in behavioral health.
- Balance better, cheaper, and faster results through effective and collaborative process design.
- Identify areas to reduce waste or improve processes in your organization.
- Turn ideas for improvement into action.
Today’s agenda

- Part I (Covering now)
  - What is Lean?
  - What is Six Sigma?
  - Examples from MHCD continuous improvement projects
  - How can these process improvement tools be utilized in your behavioral healthcare settings
  - Engaging staff in quality improvement

- Part II (Covering in next session)
  - Launching Lean and Six Sigma in your organization
  - More examples of lean/continuous improvement projects
  - Lessons learned, feedback and improvement for your lean six sigma program
Session Opener

- What problems do you need to solve?
  - Who is the customer?
  - What is the waste?
  - How does this affect the customer?
- Apply “Five Why?”
First Lean Project at MHCD

Rapid Improvement Capacity Expansion (RICE) Team
January, 2008
Lean Process Improvement: One Year After Rapid Improvement Capacity Expansion

**RICE Results**

- Analysis of the 1,726 intake appointments for the one year before and the full year after the lean project
- 27% increase in service capacity
  - from 703 to 890 kept appointments to intake new consumers
- 12% reduction in the no-show rate
  - from 14% to 2% no-show
- Capacity increase of 187 additional people who were able to access needed services, without increasing staff or other expenses for these services
- 93 fewer no-shows for intake appointments during the first full year of RICE improved operations.

- Annual cost savings (avoidance): **$90,000 - $100,000** for staffing and space
Lean Process Improvement: *RICE* Project System Transformation

![Graph showing appointments scheduled and no-show rates before and after lean improvement.](image)

- **Year Before Lean Improvement**
  - Mon: 100
  - Tue: 150
  - Wed: 200
  - Thu: 250
  - Fri: 300

- **Year After Lean Improvement**
  - Mon: 450
  - Tue: 400
  - Wed: 350
  - Thu: 300
  - Fri: 250

- **No-Show Rate**
  - Mon: 0%
  - Tue: 5%
  - Wed: 10%
  - Thu: 15%
  - Fri: 20%
How was this shift accomplished?

- Alignment of supply with demand
- Day of the week: shifted and added
  - Tuesdays and Thursdays
- Welcome call the day before
- Transportation and other information
- Consolidated steps
  - Orientation to Intake Assessment
  - Eliminated an opportunity for no-show
- Group intakes
- Overbooking
Comparing *process steps*:

**Before:** Before and After
- Total steps with recurrent steps (worst case with 3 instances of steps 4 and 5) = $3 \times 3 + 5 = 14$

**After**
- Total steps with recurrent steps (worst case with 2 instances of steps 4 and 5) = $2 \times 3 + 6 = 12$

**Eliminates 2 steps**
Comparing *process time* and *lag time*:

**Before:**
- Total time (minimum possible) = (30+50+60 minutes) + 2 days = 2 days 2 hours and 20 minutes
- Total time (maximum if consumer is admitted on 4th call)
  - = 5 weeks 4 hours and 5 minutes

**After:**
- Total time (minimum possible) = Same as above
- Total time (maximum if consumer is admitted on 3rd call)
  - = 1 week 3 hours and 10 minutes

**Process and lag time reduction of worst case:**
- > 4 weeks
Process Improvement

- Accomplished by involving clinicians and consumers
- Reconfiguration for timely and consumer-friendly access
- Measured
  - Increased intakes
  - Decreased no-show rates
  - Decreased delays to access
- Multi-dimensional impacts (projections)
  - Reduced inpatient expenses
  - Physical/Behavioral dimensions of healthcare
- Transition
- Transformation
How does this add value for the customer?

- Who is the customer?
- What do they want?
- What do they get from the improvements?

Discussion: Where is your waste or process to improve?
What impact could we have with lean process improvement in behavioral healthcare?

- Neuropsychiatric conditions account for 1/3 of years lost to disability (World Health Organization, 2004)
- In 2008, 13.4% of adults in the US received treatment for a mental health problem (National Institute of Mental Health, 2012)
- In 2006, 6.7% of adults in US received outpatient treatment for mental health problems (Substance Abuse and Mental Health Services Administration)
- Adults in US with a mental disorder in any year: 26.2% of population (Mental Health First Aid USA, 2009)
Lean in Healthcare: What do you think?

1. Lean has been popular in healthcare since the 1980: True or false?

2. Where did lean start in healthcare in the U.S:
   - A. Outpatient primary care clinics
   - B. Psychiatric inpatient units
   - C. Hospitals
   - D. Outpatient behavioral healthcare
Status of Lean in Healthcare

- Used in Hospitals since 1990s (Graban, 2008)
- Lean citations on Medline and Health Management Information Consortium databases, 1998-2007: close to 0 relative to other common QI terms,
- Sharp increase starting in 2003 (Walshe, 2009)
- Lean included in QI approaches for public health (Riley et al., 2010)
Status of Lean in Healthcare

- Many documented cases of lean success in US hospitals
  - ThedaCare
  - University of Pittsburgh Medical Center
  - Prairie Lakes Healthcare
  - St. Luke’s
  - Denver Health Medical Center
- Denver Health started with Toyota and TPS (Nuzum et al., 2007)
- In 2006, Denver Health saved $2.8M without reducing staff or patient care (Shanley, 2007)
Evolution of Lean in Healthcare: Lean Transition to Outpatient Settings

- Few cases of Lean in outpatient, especially in mental health
- Hospitals to Outpatient
  - Clinics run by hospitals
  - Collaborating outpatient systems
- Outpatient Community Mental Health Center
  - Expand Access
  - Reduce Process times
  - Streamline documentation
  - Coordinate care
  - Improve treatment planning
  - Enhance funding
Lean thinking

- Lean is a broad catchphrase that describes a holistic and sustainable approach to using less of everything to give you more.
- Lean maintains a relentless focus on providing customer value.
- Lean promotes the respect of people.
- Lean is a philosophy of continuous learning and everyday improvement.
Lean basic principles

- Customer value-only the customer defines value.
- Value stream analysis-used to describe all activities that are performed in a process.
- Everyday improvement-Kaizen activities.
- Flow-deliver smooth continuous flow of a product or service.
- Pull-services are pulled as a result of customer demand.
- Perfection-make perfection your goal.
Lean principles: Eliminate Waste

- Transport- any movement of a product or material that is not otherwise required to preform value added processing is waste.
- Waiting- Waiting in all forms is waste.
- Overproduction- Producing more than your customer requires is a waste.
- Defect- Any process product or service that fails to meet specifications is waste.
Lean principles: Eliminate Waste

- **Inventory**: Inventory anywhere in the value stream is not adding value.
- **Motion**: Any movement of a person’s body that does not add value to the process is waste.
- **Extra processing**: Any process that does not add value to the product is waste.
- **Waste identification process**
Lean Deployment

➢ Obtain top management support and active involvement.

➢ Provide training to understand lean tools, the role that culture and people play in sustainability and the philosophy of Kaizen.

➢ Start small to build success and support.

➢ Utilize assistance from a mentor or Lean professional to ensure successful implementation.
Recent Lean Project at MHCD

- Hiring new staff
- Reduced from 89 to 51 days (average), median 46.5)
- Reduction of mean = 43% = 38 days faster!
- Estimated savings for one Case Management position:
  - Vacant position cost: CM 1 salary $30,888.x3(average cost of position to company)= $92,664 divide by 52 weeks= $1,782.00 cost per week.
  - Above data suggests a 5.5 week decrease in hiring time.
  - 5.5x $1,782.00 = $9,801.00 savings in one CM position by hiring faster. Source: LasoCareers.com
Hiring Histogram after improvement

Days to Hire

Number of Days

Number of Employees

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Six Sigma: Where and How did it start?

A. With six data analysts working on an NIH grant
B. A committee that required a quorem of six members to approve process improvement projects
C. Members of a fraternity for cynical med students who labeled healthcare in the US as dysfunctional and were initially called the “Sick Sigma Section.”
D. An engineer at Motorola who was dissatisfied with the quality of manufactured telecommunication products.
Six Sigma

- Six Sigma is a problem solving methodology.
- Six Sigma performance is the statistical term for a process that produces fewer than 3.4 defects per million opportunities.
- Six Sigma improvement is when the key outcomes of a business or work process are improved dramatically.
- Six Sigma deployment is the prescriptive rollout of the Six Sigma methodology across an organization with assigned practices, roles and procedures.
The Six Sigma Framework

- Steps
  - Define
  - Measure
  - Analyze
  - Improve
  - Control

- Motorola, General Electric
- What was its initial focus?
  - Industry
  - Meaning of Six Sigma = 6σ

- Healthcare adoption
  - Now in Mayo Clinic in every function
  - Finance group used determine staffing level required to meet compliance tracking requirements
Six-Sigma Quality
3.4 defects per million opportunities

Most observations are at the Target Value

Variance = \sigma ("Sigma"), which is so small that 6\sigma fit between Target and Tolerance Limits
Six Sigma

A Six Sigma organization uses Six Sigma methods and tools to improve performance such as improving customer satisfaction, increase capacity and capability, reduce complexity and minimize defects and errors.
Six Sigma: The project strategy

Six Sigma projects follow the standardized and systematic method known as DMAIC. (Define-Measure-Analyze-Improve-Control)

Define: Set the context and objectives for the project.

Measure: Get the baseline performance and capability of the process or system being improved.

Analyze: Use the data and tools to understand the cause and effect relationships in the


Six Sigma: The project strategy

➢ Improve: Develop the modifications that lead to a validated improvement in the process.
➢ Control: Establish plans and procedures to ensure the improvements are sustained.
Six Sigma: The project deployment

➢ Establish Executive support and leadership.
➢ Identify the project leader or Champion.
➢ Identify process owner.
➢ Assemble core project team with membership from cross functional departments.
Selected Lean and Six Sigma tools

- FLOWCHARTS AND PROCESS MAPS
- ROOT CAUSE ANALYSIS AND FISHBONE DIAGRAMS
- AFFINITY DIAGRAMS AND BRAINSTORMING
FLOWCHARTS

➢ Why use it? To allow a team to identify the actual flow or sequence of events in a process that any product or service follows.

➢ What does it do? Shows unexpected complexity, problem areas, redundancy and where simplification and standardization may be possible.

➢ Allows a team to come to agreement on the steps of the process and to examine which activities may affect the process performance.
Flow Charts

- **Why?** Identify flow or sequence
- **What is it?** A picture of a process with standard symbols for steps and decisions
- **Helpful to**
  - Understand how process actually works
  - Identify problems or complexity that could be simplified
  - Train to understand a complete process

```
New Client
          ▶
           ▶
   Adult ?
       ▶
          ▶
Conduct Adult Intake Interview

Parental Consent Signed?  ◀

Obtain consent
```

- Yes
- Yes
FLOWCHARTS

➢ Serves as a training aid to understand the complete process.

➢ Identifies locations where additional data can be collected and investigated.

➢ How do I do it? Clearly define where the process starts and ends. Determine and document the steps in the process in sequence as they occur by putting them on a whiteboard or easel paper. Review it for completeness and verify it.
FLOWCHARTS: an example

Residential Manager requests temp agency staff coverage

Temp staff receive 2 hour orientation that may include MHCD site.

Safety and security issues/on call protocols are covered

Temp agency contacts Melanie Parker to schedule medical records training

Melanie emails Brit Rabinowitz to schedule medical records training

Melanie Parker creates roster and sends to Judy Mintoer and Berit

Judy adds staff names to active directory and email directory. IT adds names to Citrix

Berit receives active staff list and passwords for temp staff

3 hour medical record training class occurs including log in process/SharePoint and printer access.

Attendance log sent out. Judy de-activates no show staff/IT de-activates Citrix access for no shows. NPI info provided to Bill P.

Temp staff trained and have log in access/await assignment

Temp staff show up at assigned site and watch nutrition video

Staff log in and complete required documentation

If unable to log in, call program manager or call helpdesk

Password reset by helpdesk staff

Temp staff logs in and completes notes

Temp staff will have access to residential folder and all sites folder

1x Monthly temp agency emails active staff list to MHCD.

Draft process for onboarding temp residential staff at MHCD.
Flowchart Example: Pharmacy Prescriptions

**START:** New prescription?

Yes

Consumer sees psychiatrist.

Yes

Consumer is on DH plan?

Yes

Psychiatrist faxes Rx to pharmacy of choice or gives consumer a hardcopy of Rx to take to pharmacy.

No

Consumer requests refill by phone or in person from filling pharmacy.

MHCD psychiatrist FAXes Rx to DH.

DH prescriber receives and signs Rx.

Rx filled and consumer picks it up at DH pharmacy.

END
Continued from prior page

Refills remaining in filling pharmacy’s System?

Yes

Rx filled and consumer picks up medications.

No

Pharmacy contacts provider.

Provider okays refills.

END
Basic symbols in a process flowchart

**Definition**

**Start-and-stop**
The start or end of a process

**Example**
Patient arrives at registration desk

**Activity**
A single step in the process

**Example**
Collect patient insurance information

**Decision**
A decision making opportunity in the process

**Example**
Correct address?

**Wait**
Delay in the process

**Example**
Wait for bed

**Arrow**
Points out the direction of flow from one activity or decision to the next
Activity: Create a Flow Chart of a process that has at least two decision points (branches in the flow)

➢ Suggestions

➢ New people calling your center to receive services. Differences by types of consumers or payer type or other factors?

➢ New employee training or onboarding according to position (clinical or non-clinical, medical or other factors?)

➢ Your own processes
FISHBONE DIAGRAM

- Why use it? To allow a team to identify, explore and graphically display in increasing detail all of the possible causes related to a problem or condition to discover its root cause.

- What does it do? Enables a team to focus on the content of the problem, not on the history of the problem or differing personal interests of team members.

- Focuses the team on causes not symptoms.

- When to use: When the exact cause of an effect is not known.
FISHBONE DIAGRAM
Fishbone Example

Fishbone Diagram Used at the San Carlos Hospital

Environment
- Inadequate infrastructure
- Delivery room connected to quarantine area
- Does not speak with clients about this topic

Personnel
- Pregnant women anticipating delivery are not motivated to decide if their partner or family member should accompany them during the delivery.

Inputs
- Lack delivery room clothing for partner/family
- No opportunity to decide
- Many come alone
- Lack information

Clients

Fishbone Diagram Example

- Ever had a problem with clinical documentation?
- What can we discover through a framework of People, Plant, and Technology?
- Opportunities for improvement?
- Activity: Fill in the Fishbone Diagram
  - What is the Problem Statement (Head of the fish, “Effect”)
  - What framework categories would you use?
  - What are causes and sub-causes within these?
Fishbone Example: National Health Service (NHS) in the UK

Cancelled Operations
- Poor pre-admission procedures
- Staff shortages
- Patient no-shows
- Resources not ring-fenced

Late Starts
- Poor pre-admission procedures
- Staff delays
- Poor start-up procedures
- Patient delays

Delays Between Patients
- Poor scheduling
- Slow turn-around
- Patient delays
- Poor pre-admission procedures
- Equipment availability

Wasted NHS/Patient Time and Resources

Source: Authors based on report by Lister (2005)
Activity: Create a Fishbone Diagram for a problem in your organization

- Suggestions
  - Consumer no-shows
  - Staff turnover
  - Computer / administrative issues
  - Your own situations
AFFINITY DIAGRAM

- Why use it? To allow a team to creatively generate a large number of ideas and then organize and summarize natural groupings among them to understand the essence of a problem and breakthrough solutions.

- What does it do? Encourages creativity by everyone on the team. Encourages ownership of results that emerge because the team creates them. Overcomes paralysis which is brought on by overwhelming options and lack of consensus.
AFFINITY DIAGRAM

How to do it? Phrase the issue under discussion in a full sentence. Brainstorm at least 20 ideas or issues by recording them on paper or post it notes. Sort ideas or issues into related groupings. For each grouping create a summary or header card and move ideas or issues under the appropriate header card.
AFFINITY DIAGRAM: example

DFSS integrated care billing Affinity Diagram

<table>
<thead>
<tr>
<th>Ensures confidentiality compliance</th>
<th>Promotes information sharing</th>
<th>Promotes sustainability</th>
<th>Facilitates internal billing system</th>
<th>Supports integrated documentation</th>
<th>Supports standardization</th>
</tr>
</thead>
<tbody>
<tr>
<td>The integrated billing and reimbursement design will protect patient privacy</td>
<td>Will promote communication between partners</td>
<td>The integrated billing and reimbursement design will be able to assess the cost effectiveness of the program</td>
<td>The new design will create a process that allows for billing for integrated services</td>
<td>The new design will support shared data between partners</td>
<td>Creates roles and responsibilities</td>
</tr>
<tr>
<td>The integrated billing and reimbursement design will provide HIPAA training</td>
<td>The integrated care billing and reimbursement design will encourage departments to work together</td>
<td>The new design will support receiving revenue</td>
<td>The design will create a new billing process at MHCD</td>
<td>The new design will clearly state required documentation needs</td>
<td>Will ensure a detailed process</td>
</tr>
<tr>
<td>It will ensure that all necessary legal matters are addressed</td>
<td>The new process will identify key people to report progress on the project</td>
<td>The new design will ensure correct documentation and payment</td>
<td>The new design will support a process for gathering data</td>
<td>The new design will establish a process to allow for billing of services</td>
<td>Must aid in creating a standard process</td>
</tr>
<tr>
<td>The process will provide medical record management security</td>
<td>The integrated care billing and reimbursement design will ensure that all critical parties are involved</td>
<td>The new design will support future growth</td>
<td>The new design will establish new billing processes</td>
<td>The new design should accommodate the partners medical record</td>
<td>New process will promote consistent reporting and encourage standardization</td>
</tr>
<tr>
<td>The process will provide for tracking of completed documentation</td>
<td>The process will involve pro-active communication</td>
<td>The new process will ensure accurate billing to maximize revenue</td>
<td>The new process will support and ensure accurate billing</td>
<td>The new design will allow us to capture and bill our services</td>
<td>The new process will support standardized protocols</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>The new design must provide access to the service data</td>
</tr>
</tbody>
</table>
## Affinity Chart Example: Safety Problems in a Hospital Setting

<table>
<thead>
<tr>
<th>Security Issues</th>
<th>Safety Issues</th>
<th>Disaster Planning</th>
<th>Negligence</th>
<th>Facilities</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weapons</td>
<td>Hot Food</td>
<td>Power Outage</td>
<td>Misdiagnosis</td>
<td>Old</td>
<td>Residents</td>
</tr>
<tr>
<td>IDs</td>
<td>Smoking</td>
<td>Hurricanes</td>
<td>Confusion</td>
<td>Broken Equipment</td>
<td>Interns</td>
</tr>
<tr>
<td>Infant Abduction</td>
<td>Poisoning</td>
<td>Fire</td>
<td>Infection</td>
<td>Transportation</td>
<td>Overworked</td>
</tr>
<tr>
<td>Violent People</td>
<td>Slips and falls</td>
<td>Shooter</td>
<td>Lack of Standardization</td>
<td>Wait times</td>
<td>Unqualified</td>
</tr>
<tr>
<td>Drug Seekers</td>
<td>Loose railing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illegal Drugs</td>
<td>Falling</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Snow</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Activity: Create an affinity diagram

➢ Choose an issue, problem, or objective

➢ Examples:

   ➢ How to ensure reimbursement in collaborative integrated care systems
   ➢ Objectives and areas of focus in a strategic plan
   ➢ How knowledge is developed in Design for Six Sigma projects

➢ Group discussion of Affinity Diagrams, where to go next?
Resources for Continuous Improvement

- **Books and Printed Materials**
  - Lean for Dummies, Second Edition, by Natalie J. Sayer and Bruce Williams
    - Chapter 15, Real-Life Lean, Getting New Consumers to Show-up to Scheduled Appointments, pages 327-331

- **Web sites**
  - The American Society for Quality: [www.asq.org](http://www.asq.org)
  - [www.isixsigma.com](http://www.isixsigma.com) Tools and Templates
  - Mental Health Center of Denver: Our publications and examples [http://mhcd.org/resource-library](http://mhcd.org/resource-library)
PART TWO: LAUNCHING Lean and Six Sigma at your organization

- Part I (Covered earlier today)
  - What is Lean?
  - What is Six Sigma?
  - Examples from MHCD continuous improvement projects
  - How can these process improvement tools be utilized in Your behavioral healthcare settings
  - Engaging staff in quality improvement

- Part II (Continuing here)
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Launching Lean and Six Sigma in Your Organization

- What have you got? (Group discussion)
  - Process problems
  - Opportunities for improvement
  - Organizational commitment

- Who can do it?
  - Facilitator
  - Tools
  - Participants
    - Allocated time
    - Process knowledge
    - Management support
Lean Project Selection Criteria and Guidelines

- **What is Lean?** (Adapted from the book, *Lean for Dummies*)
  - **Lean is less:**
    - Waste
    - Time to achieve a desired outcome
    - Cost, resources, space, facilities, supplies
    - Bureaucracy
    - Mistakes, errors
  - **Lean is more:**
    - Satisfied customers
    - Employee empowerment and knowledge
    - Organizational capability and agility
    - Productivity
Projects that are suitable for Lean process improvement events meet these criteria:

(Note: There are many other valuable projects and activities that aren’t suited to Lean but are worth pursuing as innovation, service/product development, marketing, etc.)

- Increase service capacity or revenue, or decrease costs or expenses
- Add value for identifiable customers
- Reduce waste
- Improve an existing process or activity rather than create a whole new activity
- There are benefits in involving a cross-functional team
- Solutions and plans can be identified by the end of week
- There is a current state of the process and a desired future state can be identified
- Something that is repeated with some frequency (not a one-time event)
- There are benefits in process standardization
Value and Impact considerations for prioritizing and selecting Lean projects:

- (In other words, assuming structural suitability, why would we choose this project: how is it useful, what do we expect to gain?)
- Relevant to Strategic Plan
- Impacts bottom line
- Contributes to annual growth target
- Expands capacity
- Customer impact, especially *external*
- Other identifiable value
What is the *Lean Paradox*?

- Just-in-time?
  - NO!
- New Bottlenecks?
  - YES!
- Rapid Improvement?
  - *NOT*!
- Solutions
  - Clear out project clutter
  - Prioritize
  - Realign project scheduling
  - Sustainability and human behavior
Lean Project Completion Time: The Lean Paradox

Months to Implement

Project Number
# Candidate Processes for Lean Improvement: Example selection and ranking

<table>
<thead>
<tr>
<th>Process/Objective</th>
<th>Staff</th>
<th>Relevant to Strategic Plan?</th>
<th>Impact Bottom Line?</th>
<th>Contribute to Growth Target?</th>
<th>Value added?</th>
<th>Target date</th>
<th>Level of Interest or Preference (5= high, 1 =low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call center</td>
<td></td>
<td></td>
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<tr>
<td>Clinical capacity</td>
<td></td>
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<tr>
<td>Filling a staff vacancy</td>
<td></td>
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<tr>
<td>Error-free computer systems</td>
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</tbody>
</table>
Candidate Project Assessment

Activity: Apply the Project Rating sheet to review given candidate projects and some that are of potential interest to you or your organization.

Discussion

- Which projects are good candidates?
- Surprises?
- Recommendations?
Express Intake Team
August, 2008
(LaGanga and Lawrence, 2009, POMS Conference Proceedings)
Motivation: Target State

- Provide high-quality services
- Provide access to more people seeking services
- Start service delivery promptly
- Match work time to reimbursement rate
- Positive consumer experience
- Valuable clinical outcomes
Solutions

- Identify appropriate payer/contract sources
- Identify value-added intake information
- Reduced data items/forms from 17 (or 19) to 4
- No state CCAR outcome form
- Focus on appropriate treatment outcome measures
Solutions

➢ Bypass Access Team
➢ Direct to designated clinicians
➢ Continuity of care
➢ Contact & Triage form
  ➢ Halved from 4 to 2 pages
  ➢ Completed by clinicians
  ➢ Eliminate waiting for MIS staff to complete form
  ➢ Use for all new intakes, not just special grants and contracts
Electronic Health Record

- Opportunities to streamline clinical work flow
- Improve quality of care
- Structures and standardizes work processes
  - Menus
  - Programmed logic and forms
  - Data validation and feedback
- Lean Paradox
  - Bottleneck in programming
  - Implementation delays in some projects
- New forms and intake processes within 90 days
Results with Department of Corrections

- Prison parolees
- Rate of intakes *tripled*
- Duration appeared unchanged
- Standard versus actual time recorded
  - 3 hours > 2.07 average of other clinicians
Lean Process Improvement: (First 3 months)

Express Intake: Fast Track Project

Clinician Time to do Intake

- Cases
- Hours

Before Fast Track
After Fast Track
Results

- Service times shortening
- Decreased range and variability
- Room for more intakes
- Increased access to services
Human Resources Hiring Project
October, 2008
Hiring: Improving a Business Process

- Delays and bottlenecks in communication
- Automated communication
- Built on Electronic Health Record
- Required systems analysis and programming
- Six months to implement
- Reduced time to fill positions by 3 days
- Harder to measure than clinical improvement
Financial Management: A Business Process

- Initial state: Lack of feedback and reporting
- Requires technology and programming
- About a year to implement
- Dependent on completion of prior lean project for staff tracking and allocation
- Redone later with immediate implementation
  - Not reliant on technology
  - New grants management and financial staff
New Clinician Training Team
January, 2009
New Clinician Training: A Business Process

- Target State: Clinicians trained to be productive within 3 days of hire
- Job requires use of Electronic Health Record
- Quickly determined how to achieve target
- Designed new training program
- Implemented initial computer training within 1 month
- Development of on-line training modules:
  - Less progress due to other staff commitments
Insights from the First Year
Beyond Year 1: Considering Appropriate Projects and Measurements

- Project to reduce emergency room and inpatient expenses, February 2010.
  - Goal: Reduce expenses, *not* increase bed capacity
  - Reduced hospital admissions, readmissions, visits
  - Better communication and shifted utilization from costly inpatient to less expensive outpatient case management and care coordination
Designing Appropriate Projects and Measurements

- Project to improve accuracy of counting consumers funded through Medicaid, December, 2011
  - Disagreement on project scope
    - Examine organization’s entire reporting process?
    - Narrow scope on the one specific contract?
  - Lack of alignment between desires, skills, and interests of stakeholders and participants
  - Computer programming systems analysis or lean process improvement?
  - Cross-functional, multi-level lean team members or focused computer programming team?
How Lean process improvement operates

- **Rapid Improvement Events**
  - Almost week-long with 10-20 participants
  - Benefits: Concentrated, uninterrupted effort with the right participants to thoroughly review a process with those who know it best
  - Generates insights and commitment to improvement
  - Costs: Human resources involved in the events
  - Evolution: Shortened events, preliminary work
What is the RIE process?

During Rapid Improvement Event:
- Current state
- Target state
- Gap analysis
- Brainstorm solutions
- Select solutions

After
- Implement solutions
- Track progress
- Measure results
- Report results
Adding Project Champions

- Designated member(s) of the Executive Management team to ensure project progress and success
- Adds accountability
- Visibility, resources, momentum
Can you adapt lean RIEs for other problems?

- Extracting the essence of the lemon
- Participation
- Structured problem-solving
- Staff engagement and development
- Shorter RIEs with more upfront analysis and preparation
- Classic Tools of Quality and their application
- How to get from idea generation to project implementation and successful completion?
## Affinity Chart: Safety Problems in a Hospital Setting

<table>
<thead>
<tr>
<th>Security Issues</th>
<th>Safety Issues</th>
<th>Disaster Planning</th>
<th>Negligence</th>
<th>Facilities</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weapons</td>
<td>Hot Food</td>
<td>Power Outage</td>
<td>Misdiagnosis</td>
<td>Old</td>
<td>Residents</td>
</tr>
<tr>
<td>IDs</td>
<td>Smoking</td>
<td>Hurricanes</td>
<td>Confusion</td>
<td>Broken Equipment</td>
<td>Interns</td>
</tr>
<tr>
<td>Infant Abduction</td>
<td>Poisoning</td>
<td>Fire</td>
<td>Infection</td>
<td>Transportation</td>
<td>Overworked</td>
</tr>
<tr>
<td>Violent People</td>
<td>Slips and falls</td>
<td>Shooter</td>
<td>Lack of Standardization</td>
<td>Wait times</td>
<td>Unqualified</td>
</tr>
<tr>
<td>Drug Seekers</td>
<td>Loose railing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illegal Drugs</td>
<td>Falling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snow</td>
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</tr>
</tbody>
</table>
Goal

Solve Hospital Safety Problems

Sub-Goals

- Improve Personnel Performance
- Update Facilities
- Standardize Procedures

Means

- Selection and Recruiting
- Training
- Replace worn-out equipment
- Remodel facility
- Policy review
Process Decision Program Chart (PDPC), Tree Variation

- Contingency Planning
- What could go wrong?
- Choose the most effective countermeasures
Problems and Solutions???

Goal

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Inter-Relationship Digraph (ID)

- Identify Cause-and-Effect Relationships
- Identify key drivers and outcomes
- How?
  - Assemble team who is knowledgeable about the process
  - Arrange ideas/issues from other tools or brainstorming
  - Look for cause/influence relationships, determine directions, and draw arrows
  - Review and revise first round
  - Count up outgoing and incoming arrows
  - Select key items for further planning
Inter-Relationship Digraph (ID)

- Count up outgoing and incoming arrows
  - Outgoing Arrows = Root causes or drivers
  - Incoming Arrows = Key outcomes as focus for planning
- Meaningful measure of overall success
- Redefinition of the original issue
Inter-Relationship Digraph (ID)

- Count up outgoing and incoming arrows
- Outgoing Arrows = Root causes or drivers
- Incoming Arrows = Key outcomes as focus for planning

Diagram:

- **A**: In=1 Out=1
- **B**: In=0 Out=4
- **C**: In=1 Out=0
- **D**: In=4 Out=0
- **E**: In=0 Out=1
- **F**: In=1 Out=1

**Driver**

**Outcome**
Tree Diagram: Mapping Tasks for Implementation

Affinity Diagram

Interrelationship Digraph

Headers as major subgoals
Problem Cause and Effects

- Inter-relationships
- Could have many drivers and results
Activity: Inter-Relationship Digraph

- What are the issues involved with high utilization of expensive behavioral healthcare services?
- Develop an Inter-Relationship Digraph
- Identify the *Drivers* and the *Results*
Conclusions and Areas for Continued Work

• Adoption
  – Spread in outpatient healthcare

• Alignment
  – with Culture, Values,
  – and Incentives
    (Accuracy of recording)

• Agreement
  – on Project Scope and Objectives

• Appropriateness
  – Scope, goals, probability of success

• Accessibility
  – Data for analysis

• Availability
  – Systems and Staff to Support Implementation and rigorous analysis

Where will you start?
Questions? **Discussion?**

Lean Six Sigma Tools in Behavioral Healthcare

2013 CBHC FALL CONFERENCE

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