Increasing Access to Healthcare Services through Service Time Process Improvements

Production and Operations Management Society, Orlando
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Linda R. LaGanga, Ph.D.
Director of Quality Systems
Mental Health Center of Denver
Denver, CO USA

Stephen R. Lawrence, Ph.D.
Leeds School of Business
University of Colorado
Boulder, CO USA

Additional information available at: http://Leeds.colorado.edu/Overbooking
Agenda

1. Problem Setting
2. Lean Process Improvement in Healthcare
3. Express Intake Case Study
4. Managerial Implications
5. Future Research and Conclusions
1. Problem Setting
1. Problem Setting

- Improving access to healthcare services
  - Balance needs of clinic, providers, and patients
  - Funding shortages
  - Mental health / “Behavioral Health”
  - Mental Illness: 58 million or 1/4 of American Adults (NIMH, 2008)
  - People with serious mental illnesses die on average 25 years younger than the rest of the population.
  - Integration of physical and mental healthcare
Problem Setting

- Outpatient clinics
  - Not hospitals
- Initial Intake Appointments
  - Reduce duration and variability
  - Timely treatment and benefits
    - Better outcomes
  - Reduce costs
Literature: Appointment Scheduling and Yield Maximization

- **LaGanga & Lawrence (2007)**
  - Clinic overbooking to improve patient access and increase provider productivity. *Decision Sciences*, 38(2).

- **Qu, Rardin, Williams, & Willis (2007)**

- **LaGanga & Lawrence (2008)**
  - Yield Management in Health Care Clinics to Improve Patient Service and Clinic Performance, working paper, Leeds School of Business, University of Colorado, Boulder CO (in review)
Literature: Access to Healthcare

- Institute of Medicine (2001)
  - Crossing the quality chasm: A new health system for the 21st century.


- Green, Savin, & Murray (2007)
Court to Community Treatment
Outcomes Data:
Court to Community Treatment Program

- *After 18 months:*
- 2/3 Have Not Been Re-Arrested
- 80% Reduction in Jail Time

**Change in # of Jail Days: All Clients**

**Graph**
- **Pre:** N 1873
- **Post:** N 376
- **80% Reduction**
2. Lean Process
Improvement in Healthcare
Lean Process Improvement in Healthcare

- Documented success in hospitals
  - ThedaCare, Wisconsin
  - Prairie Lakes, South Dakota
  - Virginia Mason, Seattle
  - University of Pittsburgh Medical Center
  - Denver Health Medical Center

- Influences
  - Toyota Production System
  - Ritz Carleton
  - Disney

- Hospitals to Outpatient
  - Clinics run by hospitals
  - Collaborating outpatient systems
Lean Process Improvement Program

- Rapid Improvement Capacity Expansion
- Express Intake
- Expedited Hiring and Training
- Grants Management
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.
Lean Process Improvement:  
*RICE* Project System Transformation

**Appointments Scheduled and No-Show Rates**

- Year Before Lean Improvement
- Year After Lean Improvement

**Graph Details:**
- X-axis: Days of the week (Mon, Tue, Wed, Thu, Fri)
- Y-axis: Appointments and No-Show Rates
- Appointments (blue line)
- No-Show Rate (red line)
3. Express Intake Case Study

“Fast Track Intake” Lean Team
Motivation for Fast Track Intake

- More rapid access to targeted populations
  - Special grants and contract funding
  - No state CCAR needed
    - 7 pages
    - 25 outcome domains
- Scarcity of intake appointment slots
- Lengthy intake process
  - Average 2.07 hours
  - Many forms
    - 17 for adults
    - 19 for children/adolescents
Current State (Before Lean Event)

- Approximately 2/3 seeking services turned away
- If admitted, up to two week wait for intake appointment
- All slots filled early in the week
- Three or more staff required
  - Access center clinical / call taker
  - MIS staff
  - Intake clinician
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
Gaps

- Treatment delays
- Perception that center is not accessible
- Inadequate reimbursement
- Redundant data collection
- Unnecessary work and data collection
- Errors in recording and processing data
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 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
## Results for Complete Intakes (3 months)

<table>
<thead>
<tr>
<th>Service Time (hours)</th>
<th>Intakes from 2/1/08 - 10/31/08</th>
<th>Intakes from 11/1/08 - 1/31/09</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>0.50</td>
<td>11</td>
<td>2.12%</td>
</tr>
<tr>
<td>1.00</td>
<td>13</td>
<td>2.50%</td>
</tr>
<tr>
<td>1.50</td>
<td>47</td>
<td>9.04%</td>
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<tr>
<td>2.00</td>
<td>280</td>
<td>53.85%</td>
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<tr>
<td>2.50</td>
<td>125</td>
<td>24.04%</td>
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<tr>
<td>3.00</td>
<td>40</td>
<td>7.69%</td>
</tr>
<tr>
<td>3.50</td>
<td>4</td>
<td>0.77%</td>
</tr>
<tr>
<td>4.00</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>520</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

### Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Intakes from 2/1/08 - 10/31/08</th>
<th>Intakes from 11/1/08 - 1/31/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>2.06</td>
<td>1.98</td>
</tr>
<tr>
<td>Std Dev</td>
<td>0.48</td>
<td>0.46</td>
</tr>
<tr>
<td>CoeffVar</td>
<td>0.23</td>
<td>0.23</td>
</tr>
<tr>
<td>Max</td>
<td>3.43</td>
<td>3.00</td>
</tr>
<tr>
<td>Min</td>
<td>0.48</td>
<td>0.46</td>
</tr>
</tbody>
</table>
Lean Process Improvement: (First 3 months)
Express Intake: Fast Track Project

![Bar chart showing Clinician Time to do Intake before and after the Fast Track Project.](chart.png)

- Before Fast Track
- After Fast Track
Results

- Service times shortening
- Decreased range and variability
- Room for more intakes
- Increased access to services
Other Efficiencies

- Elimination of “Hidden factory” of MIS
  - Not captured in EHR system
  - Data entry
  - Checking and correcting clinician errors
  - Not visible in productivity measures

- More profitable enrollment
  - Ensure correct billing to appropriate payers

- Appropriate outcome measures
State Outcome Measure on 2,118 cases

- Not much difference from one year to the next
- Lower scores show higher recovery
- Deficit based
Recovery Marker Inventory

Averages Changes in Recovery Support Factors over First Year of Treatment

Recovery Indicator Score

Intake 6 Months 12 Months

Outpatient Treatment Teams
Community Treatment Teams
High Intensity Treatment Teams
Supportive Living Teams
Recovery Measure by Consumer

Quality of Care Peer Review

Consumer Recovery Measure

Average Score

- Symptom
- Safety
- Growth
- Hope
- Social

Dates:
- 12/7/2006
- 6/21/2007
- 12/12/2007
- 6/8/2008
- 12/9/2008
- 1/22/2009
4. Lessons Learned and Managerial Insights
Lessons Learned

- Lean event participants energized by rapid identification and implementation
- Staff embrace streamlining
- Need to standardize data recording
Managerial Insights

- Medical record / Electronic Health Record
  - Asset
  - Barrier
- Perception: Lean Improvement not rapid
- Lean program was not lean
  - Backlog
  - Bottlenecks
- Valuable feedback through action research
5. Future Directions
Future Directions

- Improve project planning and management for lean
  - What factors contribute to successful projects
  - Speed
  - Value of results

- Appropriate health outcome measures
  - Accessible
  - Understandable
  - Strength-based

- Utilize service data to continuously improve access and outcomes
Appointment Data

Appointments and No-Shows

And coming soon: Tracking reminder calls

![Graph showing Recovery Scores Across Time](image)
Comparing Walk-In, Open Access, and Traditional Appointment Scheduling in Outpatient Health Care Clinics

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Orlando – May 2009
Sunday, 1:30 – 3:00 p.m., Knave

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