Healthcare Systems and Their Use of Operations Management and Decision Sciences Techniques at Mental Health Center of Denver

Annual Meeting of the Decision Sciences Institute
November 17, 2013, Baltimore, MD
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Jim Linderman, M.A., Program Evaluator
Craig Iverson, M.A., Manager of Lean Six Sigma Process Improvement
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Cathie McLean, M.A., Manager of Clinical Quality Improvement
Wes Williams, Ph.D., Director of Research & Development

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Mental Health Center of Denver
Enriches Lives and Minds by Focusing on Strengths and Recovery

- Private, not-for-profit 501(c)(3)
- Community Mental Health Center
- Serving Denver City & County residents since 1989
- Serve an average of 16,500 people per year
- Approximately 8,250 active consumers at a time
- 600 employees; about 400 are clinical staff
Variety of Services

- Prevention
- Psycho-education
- Group & Individual Treatment
- Intensive Case Management
- Resource Center
- Pharmacy

Evidence Based Practices

- Early Childhood Intervention
- Integrated Primary Care
- Substance Use Treatment
- Supported Employment

Variety of Settings

- Schools
- Outpatient Clinics
- Nursing Homes
- Correctional Facilities
- Residential Services

Culturally Competent

- Bi-Lingual Services
- Deaf/Hard of Hearing
- Living with HIV/AIDS

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Settings and Perspectives Considered

- Outpatient Behavioral Health
- Current emphasis on *Integrated* care
  - National report finds one-in-five Americans experienced mental illness in the past year (Substance Abuse and Mental Health Services Administration, 2012)
  - Primary care providers not trained in behavioral health
  - 25-year reduced lifespan for those with severe mental illness (Colton and Manderscheid, 2006)
  - Challenges in access, coordination, payment, information
We change lives, we measure it and prove it!

Recovery Marker Inventory (RMI)
Provider rating

To what degree is RECOVERY happening?
- Multiple perspectives
- Multiple dimensions
- Change over time

Recovery Needs Level (RNL)
Suggests best level of services for stage of recovery

Promoting Recovery in Organizations (PRO)
Consumer rates provider

Consumer Recovery Measure (CRM)
Consumer rating
Recovery Marker Inventory measures recovery from clinicians’ observations
Consumer Recovery Measure captures consumers’ perspectives
Doing it *Better*
Using Outcomes to Drive Recovery-Focused Practice

- Development of Recovery-focused Outcomes
- The Four Measures of Recovery
- Using Data and Reporting To Drive Recovery Transformation
- And tools of Quality/Process Improvement!
Applied Lean, Six Sigma, and Quality/Process Improvement Models, building on:

- Initial Intake process: Realigning work by day of week and time of day to reduce no-shows and extend capacity (LaGanga, JOM, 2011)
- Integrated Care: Design for Six Sigma (Iverson, Kovach, Fredendall, POMS-CHOM Miniconference, 2013)
- Same-day Scheduling (Linderman et al., INFORMS 2013; Mock et al., POMS-CHOM Miniconference, 2013)
- Ideas to Action: Application of Quality Tools in Outpatient Healthcare (McLean et al., INFORMS 2013)
Access & Intake Process

Before and After Lean Process Improvement

Consumers

Providers

- Orientatio
- Orientatio
- Orientatio

Delay (Days)

Consumer leaves and doesn't return

Individual Individual Intake Assessment

Idle Intake Clinician due to consumer no-show

Overbooked consumer who showed up

Individual Individual Psychiatric Evaluation

Idle Psychiatrists due to consumer no-shows

Exit: Completed Intakes

27% More Intakes!

Providers

Clinician called into service for overbooked consumer who showed up

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Rapid Improvement Capacity Expansion
Increased Intakes 27%, Served 187 more people

Appointments Scheduled and No-Show Rates

Year Before Lean Improvement

Year After Lean Improvement

Appointments

No-Show Rate

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Focus: Creating More Capacity

- **Lean Approaches**
  - Hire and onboard clinical staff more quickly to have servers ready and available (Two Lean event completed, December, 2012): Decrease leadtime 43%!
    - Monitored and changed behavior of consumers and providers
    - Reduced no-shows and cancellations
    - Reduced non-productive documentation time and enhanced the service experience
  - How?
Scheduling, Capacity, and Throughput Models

- Adult clinic implemented same-day scheduling based on direct clinical knowledge, not simulation
- Worked to expand capacity by driving down unused appointments caused by cancellations and no-shows
- Increased effective service capacity by reducing overproduction of documentation
- Concurrent, collaborative documentation
New Consumers Admitted Increased 16%

Intakes by Month Past Year

*Apr 12-Aug 12 Pre NC and Same Day Access Implementation
*Aug 12-Apr 13 Post NC and Same Day Access Implementation

Changes from April 12' to April 13' Intakes per Month (Oct being 7th month or halfway point)

<table>
<thead>
<tr>
<th>Apr 12-Oct 12 Avg</th>
<th>Oct 12-Apr 13 Avg</th>
<th>% Increase</th>
<th>Consumers Per Month Increase (on Avg)</th>
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</thead>
<tbody>
<tr>
<td>210 Intakes/Month</td>
<td>244 Intakes/Month</td>
<td>16%</td>
<td>34</td>
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Results from Same-Day Access Project

- Average time from first call to intake was reduced
  - Appointments offered 6 days earlier on average
  - 9-day lead time reduced to 3 days (67% improvement)
  - Actual arrival for intake occurred 7 days earlier on average
    - 12-day lead time reduced to 5 Days (58% improvement)
- Staff kept rate is ideal (92% overall)
- Target no-show rate (better but currently 17% overall).
- Capacity appears to have increased
- 34 consumers more per month from Oct 2012 to Apr 2013 compared to previous 7 month period.

Successful pilot. Try with more staff.
Keep consumers moving, serve more

Initial Request for admission

Initial Intake and Assessment

Ongoing Service

Complete treatment and exit

Lean Event to reduce hiring delays

Capacity planning model:
- Increase throughput by shortening time in treatment
- Advance consumers to lower levels of care
- Lean: Reduce overproduction of services
Lean as a Pillar in Our Wellness Culture

What are my natural strengths? Strengths Finder

Putting my strengths to work: Catalytic Coaching

Engaging Everyone!

Measuring Results: Staff Engagement Staff Satisfaction Consumer Metrics

Best!
Cultivating a culture of operational improvement

Grow our own people

Train and educate them

Give them tools and systems
We build on staff strengths

- Recent Lean Six Sigma Workshop for Colorado Behavioral Healthcare Council conference:
  - Overview of principles and hands-on use of affinity diagrams, flow charts and root-cause analysis
  - “This was my first formal exposure to Lean and Six Sigma. The very next day I applied something I learned in your workshop in a meeting. I could see an immediate application of the tools.”
- The proof is in the Fishbone pudding!
Non-Qualifying Services - Aug 2013
### What are the most frequent “defects”?

<table>
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<th>Claim Submitted</th>
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Within just one month…

Outcomes

• **2% of these items moved to the billable category**

• **Prioritized interventions** despite a complex array of issues impacting billing

• **Gained granular understanding** about “defects”

• **Created a comprehensive report** that allows us to **monitor these business interests** and work towards **identification of target states**
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*Is cost of doing business accurately represented?*
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
Tools of Quality Add Focus

Days to Hire

Number of Days

Number of Employees

0-20  21-40  41-60  61-90  91-120  121-150  151-180  More

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Tangibles and Action Trumps Theory

- Appointment Scheduling and Lean Research
  - LaGanga & Lawrence, DSJ (2007).
  - LaGanga, JOM (2011)
  - LaGanga & Lawrence, POM (2012)
  - LaGanga & Lawrence, EurOMA (2012)
  - Lean for Dummies case study (2012)
Tools we Use for Focus, Fun, and Results

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
- www.isixsigma.com Tools and Templates
  - Add structured process analysis and simulation
Contact Us

Like us at facebook.com/recoveringdenver
Follow us on Twitter @mhcd_news
Follow our Recovery Blog at mhcd.org/blog

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