Continuous Quality Improvement in Rehab

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Disclosures

• I have no relevant financial disclosures related to this topic.

• Slides courtesy of Sandi Gulbransen, Steven Johnson, Mark Eliason, Shelly Poole.
Objectives

• Define Value in Healthcare and PM&R
• Define Value added and Non-value added
• Understand the benefit of meaningful CQI projects
• Understand the Cost of poor quality
• Understand the role of variation in Value
Evaluation of participation

• Commitment to Change Statement
  – Specific intended change
  – Level of Commitment

• Reflection on participation tool
  – Post-CQI process tool
  – Predicts meaningful participation
Understanding Value & Waste
What is Value?

Value is defined by our patient
Value in PM&R

Motivating Physicians to Improve Quality: Light the Intrinsic Fire
Kurt F. Herzer and Peter J. Pronovost
American Journal of Medical Quality 2014 29: 451 originally published online 18 November 2013
DOI: 10.1177/1062860613510201
The online version of this article can be found at: http://ajm.sagepub.com/content/29/5/451

What Is Value in Health Care?
Michael E. Porter, Ph.D.

Grading a Physician’s Value — The Misapplication of Performance Measurement
Robert A. Berenson, M.D., and Deborah R. Kaye, M.D.

ReSEARCH ARTICLE
Are weekend inpatient rehab value for money? An economic evaluation alongside a randomized controlled trial with a 30 day follow up
Natasha Kareem Brusco1,2*, Jennifer J Watts3, Nora Shields1,4 and Nicholas F Taylor1,5

The University of Utah
Division of Physical Medicine & Rehabilitation
Defining value gives us a new way to look at the world

Quality + Service

Value = \[\text{COST}\]
To increase value we must become more efficient or add features and benefits
Life Expectancy vs. Spending

Life Expectancy Past 65 & Expenditure
2011 or nearest year. Source: OECD.

![Graph showing the relationship between life expectancy past 65 and annual HC expenditure per capita. The graph includes data points for Mexico, Turkey, Hungary, and the US. A quadratic equation is provided: $y = -2E-07x^2 + 0.0021x + 14.95$, with $R^2 = 0.5898$.](image)
Life Expectancy vs. Spending

Life Expectancy Past 65 & Expend. (US excl.)

2011 or nearest year. Source: OECD.

Years of Age Beyond 65

Annual HC Expenditure Per Capita

\[ y = -4E-07x^2 + 0.0031x + 13.656 \]

\[ R^2 = 0.6417 \]
The Quality Cost Curve

As HC Quality Increases Costs Decrease

Optimal Value

Focus on Value

US Healthcare Today

Quality vs. Cost graph with points A and B, indicating the relationship between quality and cost. Point A represents US Healthcare Today, and point B is the optimal value for quality and cost.
Value added or Not?

• Value added
  – Specific process that contributes Directly to providing service the customer desires

• Non-Value added
  – Process step that does NOT contribute to providing service the customer desires
These Terms Work Against You

“Non-Value Added, But Necessary”

“Business Value Added”
Old Adage

You can have it ...
• Fast
• Cheap
• Good

Lean Says…

“Pick 3 – You can have them all…
• Standardize the work
• Create Flow
• Remove waste
• Repeat
• Heavy emphasis on principles
Ideal State Process Map: A world without waste.

CURRENT STATE PROCESS MAP

1 3 4 6 9 11 14 16 17

5 7 12

8 10 13 15

18 19 20

21 22

IDEAL STATE PROCESS MAP

1 6 14

7 12

10 13

20 22
A Case: Value and Waste

- 44 y/o female, 2 years s/p C6-C7 discectomy and fusion with no intervening trauma.
- Patient reports neck pain radiating down her left arm into her hand, with left arm and hand numbness.
- No improvement with PT.
- Patient otherwise healthy and active.
Transfer to PACU...
Communication Error

7:00

What?

This’ll be a good story someday.

Hm.
### The Seven Wastes

1. Defects/Mistakes
2. Waiting
3. Transportation
4. Over-production
5. Over-processing
6. Inventory
7. Motion
7 Wastes: Our Case Study Examples

#1 Mistakes/Defects
- Communication regarding patient room
- Unsecured O2 Tank

#2 Waiting
- 4 ½ Months between appointments
- 6 hours of waiting in clinic

#3 Transportation
- Moving patient from clinic to radiology back to clinic

#4 Over-production
- Patient boarding in PACU

#5 Over-processing
- Filling out duplicate paperwork
- Visit to pre-surgery clinic 2 days prior to surgery

#6 Inventory
- None noted

#7 Motion
- Hunting and Gathering supplies for injection
- Surgical Fellow trying to locate patient
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<thead>
<tr>
<th>The Seven Wastes</th>
<th>Common Healthcare Examples</th>
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<tbody>
<tr>
<td><strong>1. Defects/Mistakes</strong></td>
<td><strong>1. Defects/Mistakes (Healthcare)</strong></td>
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| • Time and material spent doing something wrong  
  • and later, fixing it – rework  
  • Includes costs of inspection | • Duplicate MRNs  
  • Correct labs not ordered  
  • Misdiagnoses  
  • Hospital acquired conditions |
| **2. Waiting** | **2. Waiting (Healthcare)** |
| • Time when the product is idle | • Patients or their information idle in queue |
| **3. Transportation** | **3. Transportation (Healthcare)** |
| • Transport of product or materials between work centers | • Moving patients from department to department  
  • Moving lab specimens through pneumatic tube system  
  • Moving information through email or EMR  
  • Moving meals from the cafeteria to the units |
| **4. Over-production** | **4. Over-production (Healthcare)** |
| • Producing more than is needed by the customer  
  • Producing too soon | • Delayed discharges  
  • Urinary catheter staying in too long  
  • A patient staying on a ventilator too long  
  • Compounding infusions the patient doesn't need  
  • Making a meal the patient can't/doesn't eat |
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| **5. Over-processing**  
  • Doing more work than is needed by the customer | **5. Over-processing (Healthcare)**  
  • Ordering and completing unnecessary tests, diagnostics and therapies  
  • Performing surgery when a non-invasive intervention will suffice  
  • Asking patients to come to the clinic unnecessarily  
  • Asking patients to fill out additional paperwork  
  • Putting patients on telemetry just in case. |
| **6. Inventory**  
  • Inventory can expire, get damaged, become obsolete and always ties up cash | **6. Inventory (Healthcare)**  
  • Drawing and keeping blood samples (rainbow draws)  
  • Overstocked consumables  
  • Too much bedside equipment  
  • Pre-printed forms |
| **7. Motion**  
  • Unnecessary movement within a work center | **7. Motion (Healthcare)**  
  • Nurses walking - from HUC to med room to patient room  
  • Providers walking - from floor to floor  
  • Navigating through the EMR  
  • Hunting for/gathering materials and equipment |
As Quality Increases Cost Decreases

We must reduce our tendency to over-process for this trajectory.

Note: We must also optimize non-clinical NVA.
Value stream Mapping example: Airline flight.

**CURRENT STATE PROCESS MAP**

1. A
2. B
3. C
4. D
5. E
6. F
7. G
8. H
9. I
10. J
11. K
12. L
13. M
14. N
15. O
16. P
17. Q
18. R
19. S
20. T
21. U
22. V

**IDEAL STATE PROCESS MAP**

1. A
2. B
3. C
4. D
5. E
6. F
7. G
8. H
9. I
10. J
11. K
12. L
13. M
14. N
15. O
16. P
17. Q
18. R
19. S
20. T
21. U
22. V
Discussion
Project Aim (Desired Future State)

• Reduce clinic access time for new patient visits so that 80% are seen within 14 days
Process Map v.1

Pt calls for appt → Call answered by scheduling → Scheduler gathers information → Scheduler reviews availability

0 - 5 min → 5 min → 2 min

Pt declines appointment → Scheduler reviews other available options → Appt options provided

2 - 3 min

Prospective patient accepts time / date → Waiting for appt = 22 days

Pt waits for appointment

Scheduling Process = 8 minutes

Slides courtesy of Mark Eliason, MD
Average 35 minutes
Financial impact

\[ V = \frac{Q+S}{\$} \]

- Average daily billing/ provider is $4080
- 30 providers
- 22 days -> 17 days = 3.35 extra days/provider
  - $410,040 billing / year increase
  - 22 days -> 14 days = $795,600 billing
Conclusion

• Value is best defined from PATIENT’s view
• Any activity in the value stream that doesn’t contribute to value is waste
• Every activity is either VA or NVA
• NVA does NOT equal Not Necessary
• There are 7 categories of waste
• Increased Quality will lead to decreased costs
BREAK
High Performance Employee Demonstration

- 4 most successful employee’s
- Demonstrate to colleagues method of excellence
- Skill in selecting white beads from bin
Moody’s Investors Service Special Comment
May 9, 2012

“The most meaningful cost reduction strategies will involve standardization of clinical care and elimination of variation in patient procedures. This will be a multi-year, ambitious journey requiring strong physician, management and board leadership"

Adapted from James Orlikoff, Health Care transformation. University of Utah 2012.
Medical Example: Data reveal lower hospital costs associated with patients receiving better patient care.
VDO AVERAGE COST CHART

MS-DRG 470—Major Joint Replacement or Reattachment of Lower Extremity

Discharges from July 2011 through June 2013

Average Cost Per Visit

Facility Utilization  Imaging  Lab  Other Services  Pharmacy  Supplies

Dr. A  Dr. B  Dr. C  Dr. D  Dr. E  Dr. F  Dr. G  Dr. H  Dr. I  Dr. J
JOINT REPLACEMENT PATHWAY HIGHLIGHTS

156 cases since the initial care pathway was created

- Average total facility direct cost: reduced by 8%
- Discharge delays: reduced from 6% to 3%
- Early mobility: physical therapy on day of surgery improved from 45% to 90%

Algorithms for Innovation, University of Utah
Special Cause Variation vs. Common Cause Variation
Sources of Variation in Healthcare

- **Special Cause**: Our enterprise has 100% ownership of this.
- **Patient Factors**: We have mere influence here.
- **Common Cause**: We make things *worse* by reacting to this.
By Other Names

- Special Cause Variation
- Assignable Cause Variation
- Systematic Variation
- Signal
  - Patient Factors
  - Genetics
  - Behaviors

- Common Cause Variation
- Random Variation
- Natural Variation
- Noise
Graphically: These are SIGNALS (Results of Special Cause)

- Finding Signal in the Noise
  - Control Charts
  - Regression Analysis
  - Hypothesis Tests
  - IOT Test
The Era of Entitlement

- Consider a period when your system performed optimally.
- Are ALL of your customers entitled to that level of performance?

Special
Patient &
Common

A really bad period
Average period
A great period
The Era of Entitlement

When we remove special cause variation...

...patient factors and natural random variation remains...

...and Optimal is the New Average
Value Improvement Initiatives Find & Remove Special Cause Variation

Sources of Special Cause Variation
- different care techniques
- different administrative techniques
- different sequence and timing of events
- different drugs given
- different tests ordered
- different equipment used
- …and so on
Special Cause Variation and the Quality Cost Curve

With Special Cause Care Variation Present
- different care techniques
- different administrative techniques
- different sequence and timing of events
- different drugs given
- different tests ordered
- different equipment used
Special Cause Variation and the Quality Cost Curve

With Special Cause Care Variation Removed
- different care techniques
- different administrative techniques
- different sequence and timing of events
- different drugs given
- different tests ordered
- different equipment used

...patient factors and natural random variation remains

Quality

Cost

Optimal Value
How to Remove

- Identify the sources of variation
- Quantify and prioritize the effect
- Establish a standard process
- Design standard work supported with forcing functions
- Monitor impact on performance
- Repeat as necessary
We’re not going to react to random variation, aka noise.
We’re only going to react to assignable cause, aka signal.

Monitoring a process

- We’re going to tighten the control limits.
- We’re going to change the nature of the process…
- And thus we’ll reduce the range of natural random variation associated with the process.

Improving a process

Before

After
Variation is inversely correlated with quality

3 Sigma level of reliability: 93.33% of events are within acceptable limits. ~67K defects per million opportunities

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<td>6</td>
<td>99.9997</td>
<td>3.4 %</td>
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The University of Utah
Division of Physical Medicine & Rehabilitation
We had a problem. Access

New Patient Average Schedule Lag (days)
All Clinics - FYTD (Dec 2012)

Here we are, the 4th worst offender.

FY13 YTD New Patient Average Schedule Lag
FY13 UUMG Goal
Baseline Analysis/Investigation

- 250 Current ITB Patients
- 689 Refills in 2012
- Refills by Provider
  - Primary 47%
  - Other Provider (MD, PA-C, NP) 53%
- Dose Adjustments w/Refill?
  - No 68%
  - Yes 32%
Patient arrives. Check-in. Page staff and provider.

Primary provider (47%)

Other provider if primary not available (53%)

E-mails monthly refill list from DB to OSS.

Performs MAS, other tests as time allows. Makes recommendation for any changes in dosage/concentration.

Rooms patient. Rooming report, vitals Chart to MD.

Discuss current status with patient, interrogates pump, prepares pump site, draws meds, prepares meds/pump for provider push. Waits for Provider to push meds.

Dr. Edgley will evaluate patient before refill if time allows prior to nursing prep. Evaluates patient. OK’s refill, any changes to dose.

Chart review Evaluates patient. Pushes meds. Makes changes to dose, (32%).

Programs pump, prints out report. Report given to patient.

Day of refill: Prints DB information, assigns MA and room, gathers all supplies needed for refill.

Pt. check-out from refill.

Or, Schedule later based on DB list.

Schedule next refill at check-out.
Refill Clinic Patient Criteria

- Minimum number of refills/adjustments => 10
- Standard deviation of dose adjustments < 75 mcg/ml
- Average % dose change/refill or adjustment < 15
- Parameters can be changed and automatically update patient list
Future process Refill Clinic Flow

Coordinato r

MA

Rooms patient. Rooming report, vitals. Interrogates pump.

RN

Gather supplies. Prepare Pump for Refill

PT

Quick Assessment/Outcome

MD

Review Chart

TIME (minutes)

0

15

Refill Team Paged

Rooms next refill patient

Check-in with patient. Brief Evaluation Approve Refill Push Meds

Update Pump. Confirm refill Due Date. Report given o patient.

Patient Check-Out. Next appointment Made. Visit Summary given

Patient arrives. Check-in.
Access Improvement

Overall clinic access improved from 38 days for a new patient to **13** at end of April. (Within UUMG target.)

Access for our initial provider set improved from 91 days for a new patient at end of January 2013 to **39** at end of April.
Opportunity

208 additional visits available in clinic per year as a result of our current changes.

Average clinic visit revenue: $429

Additional opportunity: $89,232
Conclusions

• Variation is a main reason for worse quality and increased cost
• Identifying Special cause variation and addressing with standard work will improve quality and reduce cost.
• If you haven’t taken a CQI course, it is well worth the time, in future returns.
• http://www.hqontario.ca/quality-improvement/tools-and-resources