Improvement Methodologies: How to Spur Change

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COAP meeting

Adapted from the PI QIOSC, Qualis Health, with information from the IHI and Wellman and Associates
Objectives

• Review the challenge of early extubation
• Discuss QI methodologies
  – Using data feedback
  – Engaging physicians
  – The Model for Improvement and PDSA
  – Lean
  – Reliability concepts
• Identify new changes to test
Early Extubation

• Measure: Percent of risk-adjusted CABG and valve patients extubated within 6 hours postoperatively

• Why: Patient centered measure
  – Discomfort
  – Atelectasis
  – Ineffective airway clearing
  – Not necessary!
Early Extubation

• What do the data show?
  – 65% compliance
  – STS measure is for patients still intubated at longer than 24 hours!!!

• What can we do to improve performance on this measure and provide better care for patients?
Improvement Methods & Tools

- Data Feedback
- Engaging Physicians
- Model for Improvement/PDSA
- Lean
- Reliability Theory
Data Feedback

• Necessary but not sufficient for change
• A $10^{-1}$ reliability concept (more later)
• Requirements for effectiveness:
  – Transparency
  – Continuous updating
  – Taking specific action based on data
  – Multiple venues for feedback
  – Real benchmarking (why not world-class?)
Intent, Vigilance and Hard Work:
10^−1 Performance: 80% or so…sound familiar?

- Common equipment
- Standard order sheets
- Personal checklists
- Feedback of information on compliance
- Awareness and training
Recent VHA Study

• Looked at VHA facilities that attained 95% and higher on 24 measures

• Asked HOW they got there
  – 55.6% = organizational change
    • Such as offering new services, changing roles/responsibilities, etc.
  – 41.4% = clinical reminders
  – 39.6% = audit and feedback to clinicians

Engaging Physicians

• Critical for results!
• Difficult for several reasons:
  – Physicians’ relationships with hospitals are often not as employees
  – Physicians’ quality and business agendas can appear to be in conflict with those of hospitals
  – Belief in personal responsibility leads to:
    • Lack of systems perspective
    • Tendency to blame individuals when things go wrong
Engaging Physicians

• So what can we do?
• IHI’s framework has six steps:
  1) Link the Hospital Quality Agenda to the Physician Quality Agenda (what do physicians want)?
     1) Improve patient outcomes
     2) Reduce hassles and wasted time
     3) Understand the organization’s culture
     4) Understand legal opportunities and barriers
Engaging Physicians, cont’d

• IHI’s six steps continued

  2) Reframe Values and Beliefs
     1) Make physicians partners, not customers
     2) Promote BOTH system and individual responsibility for quality

  3) Segment the Engagement Plan
     1) Use the 80/20 rule
     2) Identify and activate champions
     3) - 5): inform structural leaders, develop project management skills, work with “laggards”
Physician Engagement, cont’d

• IHI’s six steps continued

4) Use “Engaging” Improvement Methods!
   1) Standardize only what is standardizable (more later)
   2) Generate light, not heat, with data
   3) Make the “right thing” easy to try
   4) Make the “right thing’ easy to do!
Physician Engagement, cont’d

• IHI’s six steps, continued

  5) Show Courage!
    1) Provide backup all the way to the BOARD level

  6) Adopt an Engaging Style
    1) Involve MDs from the start
    2) Work with the real leaders
    3) Choose messages/messengers carefully
    4) Make MD improvement visible
    5) Build trust with each initiative
    6) Communicate candidly and often
    7) Value physicians’ time with your time
Resource paper

Model for Improvement (MFI)

The MFI is based on a “trial and learning” approach. This trial and learning approach revolves around three questions.

- **What are we trying to accomplish?** (AIM)
- **How will we know that a change is an improvement?** (Criteria or Measures)
- **What changes can we make that will result in improvement?** (Testing Changes)

• Focusing on these questions accelerates the building of knowledge by emphasizing a framework for learning, the use of data and the design of **effective** tests or trials.
<table>
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**Model for Improvement**

- **Plan**
- **Do**
- **Study**
- **Act**
The PDSA Cycle for Learning and Improvement

**Plan**
- Objective
- Questions and predictions (why)
- Plan to carry out the cycle (who, what, where, when)

**Do**
- Carry out the plan
- Document problems and unexpected observations
- Begin analysis of the data

**Study**
- Complete the analysis of the data
- Compare data to predictions
- Summarize what was learned

**Act**
- What changes are to be made?
- Next cycle?
Why test?

• Learn how to adapt the change to conditions in the local environment.
• Evaluate costs and side-effects of the change.
• Minimize resistance upon implementation.
Repeated Use of the Cycle

Hunches
Theories
Ideas

DATA

Changes That Result in Improvement

APSD

APSD

APSD

APSD
Healthcare applications of MFI

• The Model for Improvement has significantly affected healthcare through the IHI Breakthrough Series Collaborative which incorporates the Model for Improvement.
  - [www.qualityhealthcare.org](http://www.qualityhealthcare.org)
  - [www.improvingchroniccare.org](http://www.improvingchroniccare.org)
  - [www.ihi.org](http://www.ihi.org)
Lean Thinking

- Definition
  - Lean Thinking is a way to do more and more work with less and less-less human effort, less equipment, less time, and less space-while coming closer and closer to providing customers with exactly what they want.

  - The aim of lean is to eliminate waste.
Defining Lean

• containing little or no fat – Webster.com

• The least-wasteful way to provide value to a customer.

• What is value-added?

• History of Lean: Taichi Ohno
Lean Objectives

• Search For and Eliminate Waste
• Reduce Time Waiting and Processing
• Reduce Cost
• Add value for the customer: everything else is waste
Lean Principles

- Waste Elimination
- Standardized, Steady Flow Processing
- Inspection
- Visual Cues
Defining Waste

- *damaged, defective, or superfluous material produced by a manufacturing process* – Webster.com

- Something that consumes resources, but adds no value to a product or service.
Types of Waste

- Processing
- Inspection
- Inventory
- Wait Time
- Search Time
- Transportation
- Space
- Complexity
- People

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Standardized, Steady Flow Processing

From “batch and queue” to pull systems with standard work
Benefits of Standard Steady Flow Processing

- Less frustration and pressure for employees
- Identifies quality problems upstream in the process
- **Visual cues** make it clear when to work, what to work on, and when to start and stop processing
- Process begins to manage itself
Inspection:
Driving out Defects
Level 1: Customer Inspects

- Suppliers
- 1
- 2 (Error occurs)
- 3
- 4
- Customers

Feedback

- Customer finds defect

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Level 2: Company Inspects

Suppliers → 1 → 2 → 3 → 4 → 5 → Customers

Feedback

Error occurs

Inspector finds defect

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Level 3: Work Unit Inspects

Suppliers → 1 → 2 → 3 → 4 → 5 → Customers

- Error occurs
- Defect detected
Level 4: Self Inspection and Correction

Suppliers → 1 → 2 → 3 → 4 → 5 → Customers

Error caused, detected and corrected
Level 5: Eliminate Opportunities for Errors

Process controls and design prevent error
Spirit of Improvement

• Use our minds first, not our money
• Challenge current thinking
• Look for leadership at all levels
• Substitute “we don’t know how to do it yet” for “we can’t”
• Remember that you are the experts
Key Tools of Lean Thinking

Tools include, but are not limited to the following

- Value Stream Mapping
- Process Mapping
- Poka-Yoke (error-proofing)
- Pull Systems (Kanban – “signal”)
- Visual workplace (5S - Sort, Straighten, Shine, Standardize, Sustain)

Reliability Theory/Science

• Deliberate process design

• Goal:
  – Catastrophic processes
  – Non-catastrophic processes

• $10^{-2}$ reliability: 5 or fewer defects per 100 opportunities!
Premises

For service system failures without immediate catastrophic consequences:

- $10^{-1}$ performance indicates no articulated common process (that’s where we are!)
  
  **Test:** 5 frontline staff cannot easily articulate the process

- $10^{-2}$ performance indicates processes with medium to high variation
  
  - Test: there is some variation but 5 frontline staff CAN easily articulate the process

- $10^{-3}$ performance indicates a well designed system with low variation and cooperative relationships

R. Resar and IHI Innovation Team
$10^{-2}$ is the ONLY goal for….

- Non-catastrophic processes
  - Definition: failure of the process does not lead to death or severe injury within hours of the failure
  - $10^{-1}$ performance or worse is commonly seen in these processes

Why are we operating at $10^{-1}$ despite all of our talents and resources?
Why not $10^{-2}$ NOW?

- Current improvement methods are highly dependent on vigilance and hard work
  - Human factors science tells us there’s a limit to this
- Focus on benchmarked outcomes gives clinicians a false sense of security: biology protects us.
  - What’s our comparison? “cream of the crap” vs. world class performance
- Permissive clinical autonomy allows wide performance margins. *Benchmark to best practice, not aggregate averages; it’s simplistic to blame the docs*....
- Deliberate design to achieve *articulated reliability goals* rarely occurs
3-Tier Reliability Design Model

Prevent initial failures → Identify/mitigate that failure

Redesign to prevent future failures

Maintain current level

Improve reliability
Getting to $10^{-2}$: it’s easy!

- Your first step (standardization) is 80% effective
  - Then, of 100 patients, 80 receive the care

- Your second step (mitigation) is 80% effective
  - Then, of the remaining 20%, 16 receive the care

- You have given the care to 94% by designing for 80% effectiveness in the two steps.

- This allows the freedom to design for less than perfection. Designs are simple and “leave out the oddballs (standard design for standard inputs)”
Challenge:
Why not 10 -2 or better for YOUR patients?

Why not YOU being a leader in the 10-2 model?

AIM: 95% of patients who are able to be extubated within 6 hours ARE extubated!

Standardize; mitigate; redesign!!!