Building an Integrated Approach to Lean and the Model for Improvement

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The presenters have nothing to disclose

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"Do not seek to follow in the footsteps of the old masters. Seek instead what the old masters sought."

–Basho (1644-1694)
Describing IHI-QI

The Model for Improvement

- **AIM**: What are we trying to accomplish?
- **MEASURES**: How will we know if a change is an improvement?
- **CHANGE**: What changes can we make that will result in improvement?

Diagram: Act, Plan, Study, Do
The Model for Improvement

- **What it’s NOT:**
  - The (entire) IHI-QI approach to improvement
  - A project plan
  - Engineering
  - A ‘toolkit’
  - A collaborative

- **What is IS:**
  “A heuristic for learning from experience and guiding purposeful action.”

- **At all levels of scale...**

“An algorithm for achieving an aim at any scale”
Subject Matter Knowledge

Knowledge basic to the things we do in life. Professional knowledge.

QI: Combining subject matter knowledge with improvement science to develop effective changes.

Profound Knowledge

The interaction of the theories of systems, variation, knowledge, and psychology.

Projects

"All Improvement Takes Place Project by Project. There is no such thing as improvement generally. All improvement takes place project by project and in no other way.

As used here, “improvement project” means “a chronic problem scheduled for solution.” Since improvement project has multiple meanings, the company glossary and training manuals should define it."

Planning – Improvement - Control

"Without theory, there are no questions; without questions, there is no learning."

W. EDWARDS DEMING
THE NEW ECONOMICS
FOR INDUSTRY, GOVERNMENT, EDUCATION
Second Edition

Systems Theory
Domains of Profound Knowledge

- **Appreciation of a System**
  “System” = an interdependent group of items, people or processes working together to a common purpose

- **Psychology**
  How do people respond to change? How can we encourage constructive change and commitment to excellence? How does human perception and decision making shape process design?

- **Understanding Variation**
  How should we interpret and act on the variation that continually occurs in every system?

- **Theory of Knowledge**
  How can we learn to make valid predictions about the impact of planned changes?

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Conceptual Frameworks

- Complex adaptive systems
- Multidisciplinary teams
- Social network theory
- Reliability theory
- Program Evaluation
- Operational definitions
- Model for improvement
- Design of experiments

- Decision theory
- Leadership
- Diffusion of innovation
- Theories of motivation
- Measurement
- Regression
- Graphical displays of data
- Statistical process control

- System
- Psychology
- Learning
- Variation
Patients of the NSLIJ system with advanced illness reliably receive care that:
- Is trustworthy
- Aligns with their needs and preferences
- Avoids unneeded or undesired tests and treatments
- Engages with patients and families as respected partners in care
- Encourages patient and family responsibility(1)

Measure Concepts:
- Patient/family satisfaction
- ICU days in last X months of life
- Acute admissions in last X months of life (# & LOS)
- Cost of care in last X months (to payer, system, and family)

Theory of Improvement

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Primary Drivers</th>
<th>Secondary Drivers</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 The system of care reliably identifies patients with advanced illness</td>
<td>Reliable process for early identification of patients with advanced illness via standard criteria.</td>
<td>Reliability in healthcare processes.</td>
<td>Trigger: Norton, The ‘Surprise’ question, multiple hospitalizations, AIN criteria</td>
</tr>
<tr>
<td>P2 Informed patient preferences and hopes are understood by families and clinicians</td>
<td>Community awareness encourages early self-identification, use of advanced directives.</td>
<td>Informed, recurring Conversations (2) occur at critical times (starting early) and include key elements.</td>
<td>Providers educated and selected for Conversations.</td>
</tr>
<tr>
<td>P3 Services align with patients' needs and preferences: accessible, appropriate, respectful, coordinated across time and place</td>
<td>Preferences are reliably documented and communicated multiple ways.</td>
<td>Conversations are based on patient and family needs and preferences.</td>
<td>Elements &amp; structure of Conversations e.g. Presence-listening-Planning-Guidance cycle.</td>
</tr>
<tr>
<td>P4 Financial and payment arrangements support the aim</td>
<td>Care is provided by identified (3) interdisciplinary team, with ‘navigator’ or care manager for patient, and PCP ‘in drivers seat’.</td>
<td>Advanced directives, personal health records, electronic sharing where feasible.</td>
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</tr>
</tbody>
</table>

Notes (n) in slide notes: BTS Collaboratives

Variation

- Social network diagrams
- Changes
- Patients of the NSLIJ system with advanced illness reliably receive care that:
- Is trustworthy
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Figure A.1 Complete List of Change Concepts

1. Eliminate things that are not used
2. Eliminate multiple entry
3. Reduce or eliminate overkill
4. Reduce controls on the system
5. Recycle or reuse
6. Use substitution
7. Reduce classifications
8. Remove intermediaries
9. Match the amount to the need
10. Use Sampling
11. Change targets or set points
12. Synchronize
13. Schedule into multiple processes
14. Minimize handoffs
15. Move steps in the produce chain together
16. Find and remove bottlenecks
17. Us automation
18. Smooth workflow
19. Do tasks in parallel
20. Consider people as in the same system
21. Use multiple processing units
22. Adjust to peak demand
23. Match inventory to predicted demand
24. Use pull systems
25. Reduce choice of items
26. Reduce multiple brands of the same item
27. Give people access to information
28. Use proper measurement units
29. Take Care of basics
30. Reduce de-motivating aspects of pay system
31. Conduct training
32. Implement cross-training
33. Invest more resources in improvement
34. Focus on core process and purpose
35. Share risks
36. Emphasize natural and logical consequences
37. Develop alliances/cooperative relationships
38. Listen to customers
39. Coach customer to use product/service
40. Focus on the outcome to a customer
41. Use a coordinator
42. Reach agreement on expectations
43. Outsource for “Free”
44. Optimize level of inspection
45. Work with suppliers
46. Reduce setup or starting times
47. Set up timing to use discounts
48. Optimize maintenance
49. Extend specialist’s time
50. Reduce wait time
51. Standardization (Create a Formal Process)
52. Stop tampering
53. Develop operation definitions
54. Improve predictions
55. Develop contingency plans
56. Sort product into grades
57. Desensitize
58. Exploit variation
59. Use reminders
60. Use differentiation
61. Use constraints
62. Use affordances
63. Mass customize
64. Offer product/service anytime
65. Offer product/service anyplace
66. Emphasize intangibles
67. Influence or take advantage of fashion trends
68. Reduce the number of components
69. Disguise defects or problems
70. Differentiate product using quality dimensions
71. Change the order of process steps
72. Manage uncertainty, not tasks

Source: The Improvement Guide p. 359

Building Belief

System changes that will result in improvement

Tests increase in scope and scale. Learning from data

Change ideas, suggestions, intuition
IHI-QI Roadmap

- Plan the Initiative
  - Content Theory and Aim
  - Execution Theory and Plan
- Develop, test, and pilot changes
- Implement, sustain and control
- Spread throughout the System
- Evaluate results and ‘pass forward’

Standard Approach: Scale Up & Spread

- Develop a change
- Test under a variety of conditions
- Implement a change
- Embed in daily operations
- Spread throughout the system
- Prerequisites for change
- Confidence that change is effective
Describing Lean

Frederick Taylor
• Experiments in workplace
• Process analysis, measurement
• Top-down design: unskilled labor
• Japanese trainees visit U.S.

Henry Ford
• Assembly line
• Standard product
• Vertical integration

Walter Shewhart
• At Western Electric
• Statistical process control
• PDSA cycle

Joseph Juran
• Student of Shewhart
• Quality as a system of management
• Lectures to JUSE 1954

Edwards Deming
• Student of Shewhart
• Statistician/mathematician
• SPC lectures in Japan 1950

Don Berwick founds IHI
• Curing Healthcare 1989
• API: Tom Nolan, Lloyd Provost are QI mentors

Edward Deming Consults in U.S.
• APS Principals are students
• TV show 1990

Kiichiro Toyoda
• Toyota Motors founded 1937

Shigeo Shingo
• TPS rapid turnover

Joseph Womack
• Founding father of Lean

Some Healthcare QI Milestones

Ford Motors
• Adopts SPC, TQC 1980s

Womack
• Machine That Changed The World 1990

Toyota
• Toyota Production System 1950s-70s
• Kanban, andon, JIT, pull, Kaizen
• Workers solve problems

Virgin Mason
• Adopts Lean methods
• Virginia Mason Production System 2000

Some Healthcare QI Milestones

The Lean Ideal (Aim)

- The output is defect free.
- The product or service is delivered in response to customer need (pull, on demand).
- The response is immediate.
- Products or services are provided 1x1 in the unit size of use [i.e. tailored to the identified needs of the consumer –the authors].
- Work is done without waste.
- Work is done safely.
- Work is done securely.


Two Systems

Deming: “By What Means” the ideal?
- Production System
- Management System
The Production System

Two fundamental operating principles to achieve the ideal

• **Jidoka**: Stop when defects are detected, continuous inspection at all levels.

• **Just In Time**: “each process produces only what is needed by the next process in a continuous flow.”

Concepts To Support Lean Production

• Value versus waste

• Kaizen

• Value stream:
  - Production stream: customer desire $\Rightarrow$ production $\Rightarrow$ consumption
  - Information flows to control production

• A few Lean change concepts
  - standard work $\bullet$ flow $\bullet$ load leveling $\bullet$ poke-yoke $\bullet$
  - kanban $\bullet$ andon $\bullet$ visual control
Value Stream Map of Current State: Phlebotomy

Waste = ‘Negative Value’
Lean Production Roadmap

Value
• Specify value in the eyes of the customer

Map
• Map the value stream

Eliminate
• Eliminate waste and variation

Flow
• Make value flow at the pull of the customer

Iterate
• Continuously improve in pursuit of perfection

Management System

Ideal management system to support value-based production:
• Leader standard work
• Visual controls
• Daily accountability and planning
• Respect for people who do the work
• Unity of purpose

Managers have standard work processes, primary role as coaches for front line staff. Improvement is integrated with standard work.

Source: Virginia Mason Health System

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Source: John Toussaint, Thedacare
Comparing Lean and IHI-QI

For IHI-QI, What is Lean?

“Lean is, in a sense, a complex and deep ‘application’ of Profound Knowledge, a particular deployment of improvement in the realm of production systems... The TPS package of interdependent change concepts ... represents a ‘template’ for improving [production] systems, with a set of predefined aims, change concepts, implementation roadmap, and tools.”

Comparing Lean and QI p. 18
Key Similarities

- Purpose of the system guides improvement: Aim / Value
- Change Concepts
- Continuous Quality Improvement at the front line
- Simplified heuristic for problem solving: MFI, A3
- Measured feedback
- Emphasis on analytical, blame-free culture

Key Differences

- Organizing for improvement
  - IHI-QI: Improvement based in projects & initiatives
  - Lean: Improvement focuses on production and management standard work
- Approach to reducing variation ('where would you go first')
  - IHI-QI: SPC retrospectively identifies special cause
  - Lean: Standardized work with kaizen
- Role of leaders
  - IHI-QI: Sponsors, resources, accountability
  - Lean: Coaching, standard work, accountability
Complementary Benefits

IHI-QI
- Go to gemba
- “Bring the improvement initiative to the workplace”
- Management system improvement is essential for sustainable results

Lean
- Key concepts (e.g. “value”, “flow”) must adapt to healthcare.
- Diverse conceptual frameworks offer valuable change concepts for Lean healthcare
- Project formats as a method for Lean deployment

Waste = ‘Negative Value’

Dimensions of Care Value
- Safe
- Effective
- Efficient
- Timely
- Pt Centered
- Equitable

7 Wastes
- Overproduction
- Waiting
- Transportation
- Motion
- Inventory
- Defects
- Waste

Waste is divided into seven categories: inventory, defects, waste motion, overproduction, transportation, waste in process, and other wastes.
Wasteful Health Care

Unsafe
- Care that causes harm
- Infections
- Falls and injuries

Ineffective
- Care that does not conform to protocol
- Unnecessary care
- Insufficient care

Inefficient
- Unnecessary tests, procedure
- Unnecessary transport or motion
- Inspection
- Reports that are not used
- Readmissions

Untimely
- Waiting for information
- Scheduling problems
- Idle time for people, equipment

Inequitable
- Care based on ability to pay
- Care is based on ethnicity, language, culture

Not-Pt-Centered
- Disrespectful
- Patient not informed
- Families not included
- Unwanted care

6 Healthcare Wastes

Thank You!

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