Learning Systems for Improvement

What works, what doesn’t, and how can we get better at learning about learning?

Objectives

- Describe the learning needs and requirements of today’s quality improvement activities
- Consider the factors that might guide the selection of the right learning system
- Discuss several learning systems designs, including the BTS collaborative approach

Introductions

- **Kedar Mate**
  - Chief Innovation & Education Officer, Institute for Healthcare Improvement
- **Bruce Spurlock**
  - President, Convergence Health Consulting, Inc.
- **Carole Lannon**
  - Professor of Pediatrics, Cincinnati Children’s Hospital Medical Center
- **David Williams**
  - Executive Director, Institute for Healthcare Improvement

Agenda

- Learning systems theory and what motivated our work on this at IHI
- Collaboratives: history & what’s been learned, advantages, shortcomings and lessons learned
- Selecting learning systems and innovative learning system designs
- Case example: network-based learning
- Q&A
A learning health care system is one in which science, informatics, incentives, and culture are aligned for continuous improvement and innovation, with best practices seamlessly embedded in the care process, patients and families active participants in all elements, and new knowledge captured as an integral by-product of the care experience.

IOM Roundtable on Value & Science-Driven Health Care, 2012

Deming’s System of Profound Knowledge

“Deming’s System of Profound Knowledge

The aim of this chapter is to provide an outside view—a lens—that I call a system of profound Knowledge. It provides a map of theory by which to understand the organizations that we work in.”

Defining a Learning System

“A learning system for improvement is a set of methods including observation, experimentation, and feedback that is applied to build knowledge for prediction.”

IHI R&D Report Wave 36, Learning System Design
What’s different about initiatives that succeed?

- Patient safety
- Homelessness
- Public health
- Global health
- Politics
- Corrections
- Education
- Poverty

They share a well established, carefully facilitated learning system

What Do Exceptional Learning Systems Do Differently?

<table>
<thead>
<tr>
<th>Typical</th>
<th>Exceptional</th>
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<td>1. The goal is to facilitate learning.</td>
<td>The aim is crisp, quantifiable.</td>
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<td>2. They aggregate information &amp; produce reports.</td>
<td>They supply data in real-time on current state performance.</td>
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<td>3. They have “theory lock.”</td>
<td>They apply many stimulants.</td>
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<td>4. They invest in training &amp; instruction.</td>
<td>They invest in testing and adjustment.</td>
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<td>5. They create new networks.</td>
<td>They harness existing networks.</td>
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<td>6. The network is centrally managed.</td>
<td>Losing control is viewed as success.</td>
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Adapted from Joe McCannon

Barriers

- Crowded marketplace of ideas
- The myth of natural diffusion
- Weak hypotheses about what works
- Misaligned incentives
- Burnout and distraction
- Inertia (business as usual)
- Fear

From: Joe McCannon
Learning systems come in many forms

- Campaigns
- Collaboratives
- Aligned action networks
- CoILNs
- Wedge & spread
- Communities of practice
- Facilitated networks

Conceptual model for Learning System selection

Nature of Facilitation
Optimal Learning Model
Nature of Change

Using Collaboratives to Accelerate Improvement

Bruce Spurlock, M.D
President & CEO
Cynosure Health
• 40 Contributors
  • Don Berwick, Joe McCannon
  • Dennis Wagner, Paul McGann
  • Lucy Switz, Sam Watson, Karen Wolk Feinstein
  • Andrew Cooper, Jim Battles, Steve Hines
• 14 Chapters
  • Origin & Evolution, Key Elements, Designing Interventions
  • Funding Strategies, Recruiting, Communication, the Future

“I think when people look back at our time, they will be amazed at one thing more than any other. It is this—that we do know more about ourselves now than people did in the past, but very little of this knowledge has been put into effect.”

- Doris Lessing
Tacit Knowledge

Knowledge comes in 2 flavors – “knowledge that” and “knowledge how.” Knowing that a bicycle has 2 wheels, a seat, handlebars, and a foot-pedal crank, for example, stands in sharp contrast to the practical knowledge of how to ride a bike.

What is a collaborative?

• A group of organizations or individuals who are learning and working together towards a common aim
• Distinguished by its multi-directional learning model
• Aspects may differ based on:
  • Sponsorship type
  • Association with registries/database
  • Funding sources
  • Time or topic restrictions
• Ideal for accelerating the adaptation and adoption of existing improvement interventions

Why collaboratives work

• Being part of something bigger than yourself or your organization
• Others are doing it so can we
• Data, discipline and deadlines
• Transparency
• Accelerated learning
**Basic collaborative building blocks**

- Agreed upon topic(s)
- Known improvement interventions
- A targeted population
- A bold aim
- Measurement
- Flexible operational elements
- Peer-to-peer exchange
- Improvement capabilities
- Relationships

**A Focus on Implementation**

**What A Collaborative Isn't**

A ≠ B

Engineer ≠ Collaborative Leader

**Conference vs. Collaborative**

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<th>Traditional Conference</th>
<th>Collaborative Meetings</th>
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<tr>
<td><strong>Goal</strong></td>
<td>To inform</td>
<td>To generate action commitments</td>
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<tr>
<td><strong>Who Presents</strong></td>
<td>Content delivered by 'experts'</td>
<td>Participants are the SMEs – &quot;the answer is in the room&quot;</td>
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<tr>
<td><strong>Format</strong></td>
<td>30-45 minute or longer presentations followed by Q&amp;A</td>
<td>Short, 7-10 minute presentations, followed by organized time for individual and group reflection (the 'powerful cycle')</td>
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What is the energy in the room?

Net Backward Energy

More Negatives Than Positives

Net Forward Energy

More Positives Than Negatives

Spreading the "bright spots"
Adapting Effective Practices

- Implementation
- Flexibility
- Adaptable Features
- Essential Core

Is your topic ready?

- Are there examples of excellence?
- Is it worthy of spread?
- Do your organizations need to improve in it?
- A way to measure improvement?

Go it alone
Learning System Selection

David M. Williams, PhD, Executive Director & Improvement Advisor, IHI

Which learning system design do we choose?

Conceptual model for Learning System selection

Learning system components

- An explicit theory or rationale for system changes
- An aim or purpose
- Measurement plan and plan for sharing results
- Iterative testing (eg, Plan-Do-Study-Act [PDSA] cycles, sequential testing of changes, Shewhart time series charts)
- Informative cases to “act with the individual; learn for the population”
- Leaders to manage and oversee the learning system
To transform health care....
we must go beyond the particular
quality initiative (and be) in it for the
long term

Leif Solberg, Partners Health (MN)
"If you've seen one quality improvement collaborative...."
Ann Fam Med May 1, 2005

Learning Networks

- Communities of patients, families, clinicians, and researchers that use
data for clinical care, improvement, research and innovation

Networks

Wikipedia
Airbnb

Learning Networks

414 teams, 272 sites, 43 states + DC, 3 countries
Components of a network-based Learning Health System

- Shared purpose – focused on outcomes
- Emphasis on building community
- Effective use of technology (enhanced registry, commons, social media)
- Use of learning systems (system science, QI, qualitative research, clinical research)

National Pediatric Cardiology Quality Improvement Collaborative
2016 (n = 61 centers)

HYPOPLASTIC LEFT HEART SYNDROME (HLHS) “Half a Heart”

- A rare congenital heart defect
- Significant mortality and morbidity
- Three staged heart reconstruction
- Most expensive birth defect in the first year
- Long hospitalizations
- High complexity outpatient care
To improve survival and quality of life during the “interstage” period (between the first two open heart surgeries)

**NPC-QIC Mission**

**NPC-QIC**
- Multidisciplinary clinical teams created at each center
- Local small tests of change (PDSA Cycles)
- Spring & Fall F2F “Learning Sessions” (#13 Fall 2016)
- Monthly data collection and feedback
- Monthly teleconferences
- Registry data available to all centers for research
- Website – tool box
- Maturity and Evolution: Learning Labs/Tiers

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**Growth Variation Among Infants**


**Growth Variation**

Change in WAZ between S1 discharge and S2 (n=132)
Nutrition Bundle:
Height and weight gain after Norwood operations.

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**Identification of a Growth Bundle**

**Co-design and Co-production with Parents**

**Generation of New Knowledge**

**Use of a learning network to improve variation in interstage weight gain after the Norwood operation**

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**DINOXIN USE AT DISCHARGE IS ASSOCIATED WITH REDUCED INTERSTAGE MORTALITY AFTER STAGE I PALLIATION FOR SINGLE VENTRICLE HEART DISEASE**

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**Impact of Prenatal Diagnosis in Survivors of Critical Partial Anomalous Pulmonary Venous Return**

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**Site of Interstage Care, Resource Utilization, and Interstage Mortality**

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**Nutrition Bundle**

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**Children born to families feeling scared and alone.**

**9 moms connecting to support each other and bond as Sisters.**

**Through their determination and vision, a concept evolved...**
Linked by Heart (LBH) is divided amongst six regions within the United States. Each region is represented by 2 Regional Coordinators, helping families connect with each other (locally and those sharing the same hospital for care and treatment).

12 Regional Coordinators

Research Explained
40% Reduction in Interstage Mortality

And the parents said

Thank you for your hard work.
It's not enough. We need to keep going!!

Zoe Madison (Age 6, HLHS)

Your questions?