Lean Thinking & Practice for Better Healthcare

1st Cleveland Clinic CI Conference

John Shook
November 2012
10 Years of Lean Thinking & Practice in Healthcare

• What have we learned?
What Have We Learned?

• What have I learned?
• What has healthcare learned?
• What has "Lean" learned?
• What do we need to learn next?
What have I learned?

• Lean works in healthcare.
• Some things are a bit different in healthcare, but most things are remarkably the same.
• The things that are different are different enough to tell me that healthcare change needs to come from the inside, from people you, not people like me, but with prodding from people like me (because without the prodding, you won't change).
• The things that are different are precisely the things that lean practice is an effective solution.
What have I learned?

Old GM plant reborn with NUMMI start-up

Continued from page 1

North American workplace and the work ethic. It's a test of "mutual trust" between labor and management. Something Toyota Chairman Eiji Toyoda stressed when GM and Toyota signed their agreement last year.

Toyota wouldn't have gotten involved in the Fremont venture if the United Auto Workers union had demanded a standard labor contract, Jouppi said. So the company and the union struck a compromise with a tentative agreement signed in September 1983.

The union won recognition as the bargaining agent at the plant and a guarantee that the joint venture would select at least half of its workers from the former GM workforce.

In exchange, the UAW executive board agreed that new workers would give up seniority they built up with GM, and they recognized that Japanese work methods would be used in the plant.

No formal labor contract exists yet between New United and the UAW, but negotiations are expected to start by April and be completed in June.

Also facing the new automaker is a challenge from Chrysler Corp., the nation's No. 3 automaker, which filed an antitrust lawsuit against Toyota and GM in January. The suit is expected to go to trial March 4 in U.S. District Court in Washington.

A former Chrysler executive is president of NUMMI. The company said it would go to trial in March, but it has not yet been set. The suit is expected to be filed in April.

Toyota and GM, however, are reluctant to admit they have had to create jobs for American workers in order to protect their export sales.

There is no formal labor contract yet between NUMMI and the UAW. Company union officials have said negotiations should start by April.

Auto industry analysts say U.S. import quotas on Japanese cars are a major reason for Toyota's interest in jointly producing a car here. The fourth year of voluntary quotas should expire in April, although experts predict a fifth year. The current level is 1.8 million cars a year from Japan.

What the Japanese fear, analysts said, is that if they were to drastically cut prices of their cars and wipe out the domestic small-car market after quotas expire, the U.S. might create permanent quotas.

"They will be protecting the larger export market," Jouppi said. The Japanese, however, are reluctant to admit they have had to create jobs for American workers in order to protect their export sales.

Toyota held a 60.05 percent share of the U.S. auto sales market in 1983 compared with Datsun's 5.58 percent, according to Ward's Automotive Yearbook. GM had 44.15 percent of the market.

Toyota and Ford Motor Co. officials held talks during the summer of 1979 on a cooperative effort but failed to reach an agreement, said Tom Foote, a Ford publicist.

The two companies couldn't agree on the type of car to be produced, and Ford already was well on its way to producing its own subcompact Escort/Consul. Foote said.

What talks began between Toyota and GM, Fremont was the obvious choice for joint production, GM spokesman Don Postma said. "It was available, and it fit well with what Toyota wanted," he said.

The West Coast location makes it convenient for shipping parts from Japan, and a ready pool of labor existed in the unemployed autoworkers from the closed GM plant, he said.

About 6,000 people were employed at the GM plant at the peak of production in the late 1970s. About half of them signed up for state retraining programs after the plant closed. Andrew Balisterri of the state Employment Development Department said about 1,500 found other local jobs, especially in computer- and auto-related fields.

About 800 were transferred to GM plants in the Midwest.

Closure of the plant here has less of an impact than similar closures had on Eastern cities where local economies were less robust, said Bob McLaughlin, research analyst with the state employment office.

"This was an area that was growing anyway," which made it easier for the local labor market to absorb unemployed workers, he said.

The county's unemployment rate didn't rocket skyward when the plant closed, McLaughlin said. For many of the former GM workers, the blow was softened by generous company unemployment benefits, he said.

1983 Toyota – GM Joint Venture
What has healthcare learned?

• Lean works in healthcare.
• Healthcare is not so different after all. Yes, a human's health is not the same as building a Camry, but it’s what’s the same that is more remarkable than what is not.
What has healthcare learned?

• True, the complexity of healthcare does require specific consideration and solutions (CM) at both the macro system levels and the micro detailed levels. At either level, the answers aren't easy. In fact, they are very difficult.

• But, the essential path is very clear, simple even.

→Define value and keep a laser-like focus on it.
What has healthcare learned?

• John Shook: “Lean in healthcare is hard...“ (deep insight)
• John Toussaint: “That's interesting, my sensei says, ‘lean in healthcare is easy’.”
• When we encounter apparent contradictions like that, we tend to ask, “Which is right?”
  – Most likely both statements contain truth.
• What is "easy" about lean in healthcare?
  – Finding waste is easy. As Dr. Jack Billi says, “Look for waste?...I can’t see anything BUT waste...".
• What is “hard” about lean in healthcare?
  – A few things...
What has healthcare learned?

- Group Health reduced E.R. visits by 29% using their medical home redesign at the same time reducing hospital readmissions by 11%
- Akron Children’s Hospital reduced cost by $8 M while reducing appointment access wait times by 74,600 days
- ThedaCare’s redesigned inpatient Collaborative Care unit has achieved 0 medication reconciliation errors for over 4 years and the cost of inpatient care dropped by 25%
- Henry Ford reduced infections rates, falls, and medication errors in 2010 resulting in a $4.4 M improvement
- Mercy North Iowa achieved zero blood specimen tube labeling errors for over a year
- Seattle Children’s avoided $200M in capital expense by freeing capacity
- Cleveland Clinic improved ED STAT blood test time from 71% to 97% compliance of 45 min standard

Source: Health Affairs 2009, Volume28, No: 5:1343-1350, America Journal of Managed Care, September 2009
What has "Lean" learned?

- Lean works in healthcare.
- That was a surprise to some, not to others.
- In spite of the considerable and obvious difficulties, once you put your head down and focus on the work, improvement in healthcare delivery is surprisingly "easy" - that is, quick, direct, and dramatic.
- Success in improving healthcare systems, however, is proving much more difficult.
System Kaizen for Healthcare

System Kaizen
Eliminate Muri and Mura

Point Kaizen
Eliminate Muda

Sr. Mgmt.

Middle Mgmt.

Front Lines
Value Stream Map for a Simple Outpatient Visit - 1998

CURRENT STATE
Problems: Long wait times
Backlog (Inventory) of appointments
Long initial phone calls, high "call out" rate
Many hand-offs, repeated information
Two customers:
- patient
- doctor
Unclear "value" of product

SCHEDULER
57 calls

1 MD = 1800
Panel
18/day

△ 18/52 or
34% Failure

SUPPLIES

RECEPTION
15-30'
8 Hrs
1 per Provider

NURSE
4 55-10'
10-50'
8 Hrs
1 per Provider

PROVIDER
4 15-25'
6/7 Hrs
1 per Patient

ADDITIONAL SERVICES

REFERRAL TESTS

TWO WEEK BACK LOG

*
Learning To See - 1998

**VALUE STREAM VISION Questions**

- What is the Takt Time?
  (How do you understand customer demand?)
- Where can you flow?
- Where should you pull?
- At what single point in the production chain do you trigger production?
- How much work do you trigger and take away?
- How do you level the production mix?

**PROCESS KAIZEN to Support the Value Stream Vision**

- What process improvements are necessary?
  (reliability, quick changeover, etc.)
What process improvements are necessary?
Value Streams

• Value streams in most organizations flow horizontally

• But…

• Almost all complex organizations are vertical in orientation

• As a result, all large organizations end up in a matrix

• As a result, flow is difficult to achieve
Vertical Orientation of Organizations
Horizontal Flow of Value
What Do We Need to Learn?

• Lean thinkers need to learn to:
  ➢ Think horizontally ( = see the flows from end-to-end)
  ➢ Act horizontally ( = collaborate across verticals to optimize the flows)

• Solve problems and make improvements at the value stream and system levels.

• To provide needed value with less time, resource, effort & cost.
The Matrix Problem

• The focus of a lean organization is the horizontal flow of value, as overseen by a responsible person, yet there are strong vertical functions...

• How do those doing the actual work in the functions avoid the dreaded “two boss” and conflicting priorities problems?
<table>
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<tr>
<th>RESPONSIBILITY-BASED</th>
<th>AUTHORITY-BASED</th>
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<td>Focus:</td>
<td>Focus:</td>
</tr>
<tr>
<td>Right Decisions</td>
<td>Decision Rights</td>
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</table>

Making Decisions and Creating Alignment
Lean Management
Responsibility ≠ Authority

• In my five years in Toyota City, almost never was I given a solution.

• Yet, I was not free to just do what I wanted.

• I was given clear responsibility to propose solutions to problems I owned.
Impact of Lean Transformation at different organizational levels

Front Lines

Senior Management

Middle Management

Must establish direction

Must lead the actual operational change

Must “Do”

A Difficult Struggle at the Mid-management and First Line Supervisory Level

Likes the results

Left with changed, uncertain role

Likes the involvement

Muri: overburden
Mura: variation
Muda: waste
Basic problem to solve at different levels of the enterprise

A Difficult Struggle at the Mid-management and First Line Supervisory Level

Role

Must establish direction

Must lead the actual operational change

Must “Do”

Impact

Likes the results

Wants to be successful

Likes the involvement

Senior Management

Middle Management

Front Lines

Responsibility: Muda

Responsibility: Mura & Muri

Responsibility: Muri & Mura

Responsibility:

Mura: variation
Muri: overburden
Muda: waste

John Shook
The challenge of any business:
Matching capability with demand

**MUDA (Excess)**
- Know your demand
- Know your true capability (capacity)
- Create flexibility to get them to match

**MURI (Overburden)**

**MURA (Instability)**
- Know your demand
- Know your true capability (capacity)
- Create flexibility to get them to match
System Design to Control the 3 M’s

\textbf{MUDA} = Waste

\textbf{MURI} = Overburden

\textbf{MURA} = Variation, fluctuation

1. Design the system with sufficient capacity to fulfill customer requirements without overburdening people, equipment, or methods.
2. Strive to reduce variation/fluctuation to a bare minimum.
3. \textit{Then} strive to eliminate sources of waste!
Provide the right tool for the right job

Muri: overburden
Mura: variation
Muda: waste

PDCA tool: Hoshin Kanri
Responsibility: MURI & MURA

PDCA tool: VSM and A3
Responsibility: MURA & MURI

PDCA tool: Standardized Work
Responsibility: MUDA

MUST “DO”

MUST LEAD THE ACTUAL OPERATIONAL CHANGE

MUST PROVIDE VISION AND INCENTIVE

LIKES
- the results
- needs the right tools and skills to be successful
- likes the involvement

LIKES THE PROJECT
- the right job
- the right tool
- the right job

MIDDLE MANAGEMENT

SENIOR MANAGEMENT

FRONT LINES
What have I learned?

Three hi-tech tools or processes that are revolutionizing healthcare…
Big Three Hi-Tech Game Changers to Revolutionize Healthcare

1. White boards
   - and other, simple collaborative thinking and communication devices, such as
     - A3, Value Stream Maps

2. Huddles
   - and other simple, real-time ways for co-workers to get together to share information, plans, plan vs actual status, and to learn collaboratively

3. Checklists
   - and other simple devices to clarify and reinforce agreed best ways of working
     - i.e. Standardized Work
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**Redesigning Care**

*Improving the patient journey in AAU*
What have I learned?

• Fixing the factory floor is not sufficient.
• But, it is necessary.
• It is, in fact, the most necessary thing.
Social-Technical Job Design

Andon

1 2 3 4

Signal cord

Team leader

!!!

Start of cycle

Workstation 3

End of cycle

60 sec.

50 sec.

40 sec.

30 sec.

20 sec.

10 sec.

60 sec.

josh shook

Kaizen Express

By Toshio Horie

and John Shook
It’s easier to act your way to a new way of thinking than to think your way to a new way of acting.
What have I learned?

• Fixing the factory floor is not sufficient
• Organizations are broken, vertically and horizontally – up and down, top to bottom
Leadership for Delivery of Better Healthcare

Anonymous healthcare CEO: “John, I can’t get my organization to do this. How can I get my people to “do this”…? → Only one way…
Leadership for Delivery of Better Healthcare

• “How can you get others to change?
Only one way…
The challenge is not “getting other people to change”…
The challenge is getting YOU (and me) to change!
The Lean Leader’s Challenge

• Make objectives, outcomes, assignments clear enough that the subordinate can approach the task with confidence.

• Yet, open enough that responsibility is not taken away.

• So the subordinate has clear responsibility to propose solutions with a sense of entrepreneurial ownership.

→ Clear direction with clear ownership
What, then, to do?

Three things to change to Lean mgmt:
1. Intention – manifested in a decision
2. Process - a *means*, a *routine*
3. Practice, practice, practice…
   - *Right* practice, deliberate practice, perhaps with a coach
Practice, practice, practice...
...perhaps with a coach!
Practice, practice, practice... But, *right* practice, deliberate practice...
How do you develop people through the job?

• It is more important to provide the right question than the right answer.
• Lean management tools provides standard structures to ask questions.

Got Coach?
It is more important to provide the right question than the right answer.

Lean management tools provides standard structures to ask questions.

“All any of us have are our considerable charm and powers of persuasion…” (Alice Lee)
Healthcare Value Network

Founded through a partnership between LEI and the ThedaCare Center for Healthcare Value

Mission: Fundamentally improve healthcare delivery through lean thinking

HealthcareValueLeaders.org.
What do we need to learn?

- Transparency of Cost, Quality, Risks and Consequences
- Care Delivery Redesign with Focus on Value to Patient
- Payment Models that Reward Value
Lean Thinking & Practice for Better Delivery of Healthcare

• Care delivery redesign with focus on value to the patient through lean thinking and practice.

Systemically develop people and continuously improve processes to solve customer problems while consuming the fewest possible resources
People & Process Balanced by Management
Lean Transformation

Social and Technical
Lean Transformation

Social

People

Process
Lean Transformation

People

Process

Technical
Lean Transformation

Social

People

Process
Lean Transformation

People

Process

Technical

john shook
People & Process
Balanced by Management
People & Process
Balanced by Management
Basketball Coach John Wooden

“Everyone is a teacher. Everyone. All the time.”

http://www.youtube.com/watch?v=zAFcV7zuUDA&feature=player_embedded
A Coach for Atul

• Atul Gawande’s performance as a surgeon plateaued after eight years of practice
• So, he recruited retired professor of surgery Robert Osteen
• Osteen was an “unusual teacher”
  – never told exactly what to do
  – used questions to get residents to think like a surgeon
A Coach for Atul

• Osteen advice: If you ask staff for help with a task and they don’t do what you want right away, wait 30 seconds: “Get them to think” – it’s the only way people learn.

• Executive coaches, life coaches, personal fitness coaches, twitter coaches…

• Dick Fosbury developed the revolutionary Fosbury Flop in defiance of coaches
A Coach for Atul

• Avoiding even one complication saves on average $14,000
• We tend to think medical progress equals technology
• Coaching done well may be the most effective intervention designed for human performance
Lean Production, Lean Thinking
What is the Lean Enterprise Institute?

- Founded in 1997 by Dr. James Womack, principle scientist of the MIT IMVP study that resulted in “The Machine That Changed the World”
- Non-profit education and research institute
- Based in Cambridge MA, with 16 global affiliates
- Over 225,000 members from all industries
What is the Lean Enterprise Institute?

Sponsored founding of three additional organizations to promote lean thinking:

• **Lean Global Network** to promote the application of lean thinking in every endeavor, everywhere

• **Lean Education Academic Network** to promote lean thinking in education

• **Healthcare Value Network** to promote lean thinking in healthcare
Lean Education Academic Network

• A forum for educators to promote lean thinking in education through sharing ideas, challenges, teaching methodologies, and research
• President: Professor Peter Ward of the Ohio State University

www.teachinglean.org
Lean Enterprise Institute

Publications

Events, Industry Networking

www.lean.org community with over 225,000 members

Digital books, courses, social networking

Education: public and in-house workshops

Coaching
LEI as a Collaborative Process

Lean Thinking Everywhere

Co-Learning
Hands-on Collaboration
Distance Collaboration

LEI
- Publish books, web, apps
- Develop Education programs
- Share learning with community

Lean Community
- Management Systems
- Operating Systems

Individuals, Organizations

Individuals, Organizations
What do managers need to do?

• Make direction clear, establish alignment around the vision – through action.
• Design and manage value streams that flow value smoothly to the customer.
• Make responsibility clear at each step along the horizontal value streams and throughout the vertical lines.
• Develop people and processes to expose problems as they occur and improve the situation as it evolves.
Lean Management
Control with Flexibility

• This way of managing provides extraordinary focus, direction, “control.”

• While at the same time providing maximum flexibility.

• This way of working can resolve the age-old dilemma that encumbers all large organizations: control vs. flexibility, or direction vs. adaptability.
What happens when we tell people what to do?

1. We deprive them of the opportunity to think.
2. You take the responsibility away.
3. They might do it (and you might be wrong!).
A Problem is Knowing:

Where you want to be

Gap = Problem

Where you are
What have I learned?

Fixing the factory floor is not sufficient
Healthcare Cost
International Comparison

Public and Private Health Expenditures as a Percentage of GDP, U.S. and Selected Countries, 2008

Source: Organisation for Economic Co-operation and Development (2010), "OECD Health Data", OECD Health Statistics (database)
Notes: Data from Australia and Japan are 2007 data. Figures for Canada, Norway and Switzerland, are OECD estimates. Numbers are PPP adjusted.
$1 in $3 spent in healthcare in US is probably waste.

The relative amount is waste in healthcare delivery is roughly equal in every country. That is, if it’s 1/3, then its 1/3 everywhere.

So even if we take all the waste out of our delivery processes, the US will still spend twice as much as other countries.
## $20 Billion Worth of Errors

<table>
<thead>
<tr>
<th>Medical Error</th>
<th># Errors (2008)</th>
<th>Cost Per Error</th>
<th>Total U.S. Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Ulcers</td>
<td>374,964</td>
<td>$10,288</td>
<td>$3,857,629,632</td>
</tr>
<tr>
<td>Postoperative Infection</td>
<td>252,695</td>
<td>$14,548</td>
<td>$3,676,000,000</td>
</tr>
<tr>
<td>Complications of Implanted Device</td>
<td>60,380</td>
<td>$18,771</td>
<td>$1,133,392,980</td>
</tr>
<tr>
<td>Infection Following Injection</td>
<td>8,855</td>
<td>$78,083</td>
<td>$691,424,965</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>25,559</td>
<td>$24,132</td>
<td>$616,789,788</td>
</tr>
<tr>
<td>Central Venous Catheter Infection</td>
<td>7,062</td>
<td>$83,365</td>
<td>$588,723,630</td>
</tr>
<tr>
<td>Others</td>
<td>773,808</td>
<td>$11,640</td>
<td>$9,007,039,005</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,503,323</strong></td>
<td><strong>$13,019</strong></td>
<td><strong>$19,571,000,000</strong></td>
</tr>
</tbody>
</table>

Source: *The Economic Measurement of Medical Errors*, Milliman and the Society of Actuaries, 2010

What happens when you give people solutions?
Problem Solving Focus by Level

Senior Executives
- PDCA Tool: Policy Management
- Responsibility: MURA & MURI

Middle Management
- PDCA Tool: VSM or A3
- Responsibility: MURA & MURI

Front-Line Supervision
- PDCA Tool: Standardized Work

Value-Creating Workers
- PDCA Tool

- INNOVATION (KAIKAKU)
- BOLD NEW INITIATIVES
- WORKING IN NEW WAYS TO ACHIEVE NEW AIDS

- KAIZEN
- IMPROVEMENT
- SOLVING PROBLEMS and REMOVING BARRIERS TO RAISE PERFORMANCE TO NEW LEVELS

- MAINTENANCE (IJI)
- ROUTINE WORK
- SOLVING PROBLEMS TO REACH BASE-LINE DESIRED PERFORMANCE

Adapted from: Gemba Kaizen Masaaki Imai
Lean in Medical Education

Lean has yet to make it into mainstream teaching of medicine. This in spite of:
• What is most broken in medicine and academia in general is precisely a dynamic that lean fixes.
• Lean promotes connectivity; it emphasizes the connections, the relationships between things.
• Traditional academia (medicine or otherwise) is not good at that.
• The Trifecta: government, healthcare, academia
Lean in Medical Education & Research: Four Dimensions

- Teaching Lean
  - Specific courses
    → Need content diffused throughout curriculum

- Lean Teaching
  - Lean Learning theory – how should lean thinking be taught
    → Need overall curriculum design

- Research
  - What is the impact of lean thinking on healthcare?
  - How can lean thinking be applied to doing the research?
    → Need “Action Research”, Experiments, Surveys,

- Lean Thinking for the Medical College itself
  - Lean Administration: Eliminating waste in college administration
    → Need a revolution in the institutions themselves
High-Level Transformation Model

• Basic Approach in all cases: PDCA – The art and craft of science

• Specific Approach in each case: Situational, determined by asking
  – “What problem are we trying to solve?” What business need?
  – “Where can we start small?” - even when going big

• TWO Pillars: Operational Change and Capability Development
  – Operational Change
    • Start with the work – find problem, gap
      – Individual level, system level
  – Capability Development
    • Problem-solving, improvement capability
    • At all levels

• Ownership clarity
  – Internal – executive sponsor and operational leader
  – External – project coach, mentor, architect
What, then, to do?

It’s completely binary…
• Do these things and you will successfully transform,
• Don’t and you won’t.

1. Intention (manifested in a decision)
2. Process (a **means**)
3. Practice (deliberate, right practice)
Capability Development Through Collaborative Problem Solving

No Problem is a Problem!

CURRENT CONDITION

TARGETED CONDITION

Gap/Problem/Oppportunity

Next Targeted Condition