A Pittsburgh Perspective of Applying Lean Thinking Principles in a Community Health Center Setting

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Our Discussion Today

- Who are the players?
- What is *Lean*?
- How did it develop?
- Lean strategies
- A Pittsburgh Approach
- Resources
What is Lean and Why?

- *Lean Principles* derive from the Toyota Production System (TPS)
- Designed by Taiichi Ohno; made famous by Womack, Jones and Roos
- In most systems only 5% of activities add value; 35% are necessary and don’t add value; and 60% add no value
- Elimination of waste is a major resource in cost reduction
- Industry referred to as “Just In Time.”
Western PA Health Disparities Collaborative:
Pilot Project of HRSA HDC 2005, Phase I Diabetes

- 8 Health Centers in Western Pennsylvania
- Collaborative looked for opportunities to Partner with local support of the Community Health Centers and established a partnership with Pittsburgh Regional Healthcare Initiative (PRHI) for training on the application Lean Principles (Toyota) to Healthcare, called Perfecting Patient Care.
A Definition of Lean

A systematic approach to the identification and elimination of Waste or Non-value Added activities through continuous improvement.
Lean Thinking applied to Health Disparities Collaborative: A Systems Approach

<table>
<thead>
<tr>
<th>HDC COMPONENTS</th>
<th>LEAN THINKING APPLIED TO HDCS</th>
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<tbody>
<tr>
<td>Chronic Care Model</td>
<td>Greater focus on exploring 6 areas of Chronic Care Model to identify what is lacking within the system and what in the systems needs to be fixed.</td>
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<tr>
<td>Improvement Model</td>
<td>Increasingly explore each phase of P-D-S-A cycles to include “mapping” out the current condition in the health system to begin to analyze how to redesign and implement process improvement (e.g. solve problems and implement solutions).</td>
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<tr>
<td>Learning Model</td>
<td>Emphasis on “team approaches” and the “empowerment” of staff to solve problems and implement solutions, restoring human respect back into the system.</td>
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Principles of Lean

- Focus on *Value*-From the Customer’s perspective
- Understand the *Value Stream*
- Seek *Perfection*
- Optimize *Flow*
- Design systems to *Pull* demand
## 7 Forms of Waste

<table>
<thead>
<tr>
<th>Form</th>
<th>Description</th>
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<tbody>
<tr>
<td>Overproduction</td>
<td>Producing more than needed</td>
</tr>
<tr>
<td></td>
<td>Producing faster than needed</td>
</tr>
<tr>
<td>Waiting</td>
<td>Time when a worker is idle</td>
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<tr>
<td>Transportation</td>
<td>Any movement of material or information not essential for the process</td>
</tr>
<tr>
<td>Processing</td>
<td>Operations that in reality do nothing</td>
</tr>
<tr>
<td>Inventory</td>
<td>Anything more than immediate needs</td>
</tr>
<tr>
<td>Motion</td>
<td>Motion of man or machine that is unnecessary</td>
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<tr>
<td>Correction</td>
<td>Rework and inspection</td>
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Value Stream Process Mapping

- A visual snapshot of the current flow of the process
- An opportunity to identify the 7 forms of waste and where constraints and barriers exist
- A discipline of linking waste to impact on productivity and cost
Mapping Standardized Operations

Method: Employee Focused Analysis
- Identify every step in process
- Document duration of event
- Classify event as Value added or Non-Value Added
- Graphic depiction of movements
- Identify cyclical workload

Goal: To achieve an end result that is a more efficient process.

Before

After
How to Get Started in Your Center

1. Establish the mapping team and conduct an observation, focusing on an area of operations in the clinic (e.g. front desk and registering a patient)

2. Observe what you are seeing in real time and record the time the event occurs so that the information can be transferred to a flip chart

3. Flow the process on a series of flip chart paper/poster board and use Post-it Notes for each step of the process

4. Draw a Value Stream map and post it where your team can review over several days and add thoughts and observations
Next Steps

5. Staff participate in defining what a defect is at each step of the process
6. Return and look at the process from the lens of the seven types of waste
7. Flag steps/activities you intend to eliminate
8. Draw a revised map of the improved process, educate staff to implement widely
7 Waste Analysis

- Explore your flow through each lens:
  - **Overproduction** - what examples of staff waiting; too many supplies; etc
  - **Inventory** - where are supplies unnecessarily stored
  - **Extra processing** - which steps can be eliminated
  - **Motion** - draw the actual movement of staff and patients
  - **Defects** - what errors or delays can occur at each step
  - **Waiting** - where are there bottlenecks causing waits
  - **Transportation** - where do you move the patient or information unnecessarily
East Liberty Family Health Center

- Urban, Faith-based health center (2 sites) serving patients in Pittsburgh, Pennsylvania

- 2 Health Centers, Located in Pittsburgh, Pennsylvania

- Med/Den/OB/Rx/DA/MH/CS

- Outreach – OB/Peds
  Homeless/Homebound

6400 pts/year, 35,000 encounters/year
Chronic Care Model

To achieve improvement for people with chronic conditions, an organization must make changes to improve six fundamental areas in parallel:

1. Self-management
2. Decision support
3. Clinical information systems
4. Delivery system design
5. Organization of Health Care
6. Community
Chronic Care Model

Health System

Health Care Organization
Leadership visibly supports improvement and encourages systematic handling of errors

Decision Support
Embed evidence based guidelines into everyday practice

Clinical Information Systems
Provides reminders for individual care and identifies population needs

Delivery System Design
Reliance on planned interactions, case management for complex cases

Self-Management Support
Pt. centered goal setting and disease management

Community Resources and Policies
Links with community resources and agencies

Informed, Activated Patient/Family

Productive Interactions

Prepared, proactive Practice Team

Optimal Functional and Clinical Outcomes

Adapted From presentation by Ed Wagner, MD, MPH
Defining the Problems: An Inadequate Health Care System

Usual Care Model

Health System

Health Care Organization
Leadership concerned about the bottom line
Incentives favor more frequent, shorter visits
No organized QI

Community Resources and Policies
No links with community agencies or resources

Self-Management Support
No systematic approach
Didactic in orientation

Delivery System Design
Reliance on short, unplanned visits

Decision Support
No agreement on good care; traditional referrals

Clinical Information Systems
Don’t know patients or what they need

Uninformed, Passive Patient/Family

Frustrating Problem-Centered Interactions

Unprepared Practice Team

Sub-optimal Functional and Clinical Outcomes

Adapted From presentation by Ed Wagner, MD, MPH
Identify the Key Changes

Start with how the current processes are expected to change...

<table>
<thead>
<tr>
<th>From:</th>
<th>To:</th>
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<tbody>
<tr>
<td>1. Focus on acute issues</td>
<td>1. Planned visit model</td>
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<tr>
<td>2. Provider driven instructions</td>
<td>2. Patient sets and owns goals</td>
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<tr>
<td>3. Individual practices</td>
<td>3. Evidence-based teams</td>
</tr>
<tr>
<td>4. Paper medical record documents individual patient care</td>
<td>4. IS technology used to support population management</td>
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Improvement Model

- PDSA cycles are run in each component of the care model to effect organizational change and transformation
- ELFHCC recognized after we began Collaborative work that we attempted to do our PDSA cycles without thoroughly understanding what problems exist within our system BEFORE we run a PDSA to fix something.
ELFHCC HDC experience

- HDC collaborative work was started in 3/05; the work has been quite fruitful and we are now at the point of looking into readiness for spread of changes to other diabetic patients outside our population of focus, and potentially to other chronic diseases.
Challenges to sustainability and spread

- Increased data entry as we enter more patients into our registry (double data entry as we have EMR separate from registry data base)

- High quality care seems to = low volume of visits- is there a way to combine high quality with increased volume of visits?

- Realization that without addressing some of our office processes/pt. flow issues, this work might not be sustainable on a large scale.

- Resistance to change/perception that this will mean MORE WORK!
Perfecting Patient Care (PPC)

- Perfecting Patient Care provides a set of tools for continuous quality improvement based on the Toyota Production system. These tools compliment and augment the PDSA model for improvement taught in the Health Disparities Collaborative.
Perfecting Patient Care-

Define Current Condition

PPC offers a set of tools to:

- Define and understand our current condition through observations of the work in progress.
- Map out activities of individuals, how these individuals connect with one another, and the pathways that patients, information or services follow as they are processed in our office.
Perfecting Patient Care

- Once the current condition of any process has been defined, multiple opportunities for improvement and to eliminate waste become readily apparent.

- Problem solving is the goal (not blaming!) and should be done using the scientific method, at the lowest level possible (i.e. front line who know the work), under the guidance of a teacher (team leader), striving for the ideal.
Perfecting Patient Care

- Four areas of work that are focused on:
  1. Activities
  2. Connections
  3. Pathways
  4. Improvement

These result in the four rules in use...
Rule #1

All work must be highly specified as to content, sequence, timing, location and expected outcome.

e.g. standardized work processes
Perfecting patient care

Rule #2

Every customer-supplier connection must be highly specified, direct, and there must be an unambiguous yes-or-no way to send requests and receive responses.
Rule #3

The pathway for every product and service must be predefined, highly specified, simple, and direct with no loops or forking.
Perfecting Patient Care

Rule #4

Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the lowest possible level in the organization toward the ideals.
PPC Ideal-patient perspective

Meeting each patient’s needs

*what they need, when they need it, in the amount they need.*

... in an ideal way

*on demand, defect free, one-by-one, with no waste, immediately and safely.*
PPC Ideal- worker’s perspective

- Health Care workers are our most valuable resource.
- Health Care workers have the right to do an excellent job.
- PPC’s system can support patient and health care worker’s objectives by eliminating waste that keeps workers from meeting patient’s needs.
Continuous Quality Improvement (CQI)

CQI helps these 2 interests to converge rather than working at cross purposes, with improved patient and worker satisfaction.
Using PPC in the Community Health Center setting

- At ELFHCC, the collaborative work we have been doing in the last year has been the catalyst for us to begin to incorporate PPC tools into the nimble structure portion of our strategic plan to make our operations more efficient and increase patient and worker satisfaction.

- This work of eliminating waste and standardizing work processes will help us to continuously improve and spread the chronic care model throughout our organization and be a nimble organization able to respond to changes in the health care environment both internally and externally.
PPC in the Community Health Care Setting

- We have started our first project by mapping the flow of patients from check-in to check-out through a series of observations where the work is done.

- We are now gathering other observations from the staff at large about this process, and have chosen one small piece to investigate first, that being reasons providers have to leave the exam room while in the middle of a patient visit.
We are in the process of collecting data as to why providers leave the room. 
examples: to get prescriptions from printer, supplies not in the room, information needed for visit not available, etc.

Once the data has been collected we can begin to make suggestions for changes to test.
examples: put printers in every room, change the way we stock rooms, obtain discharge summaries prior to hospital follow-up visits.
PPC in the Community Health Center Setting

Other efforts we will be applying PPC principles to are maximizing our use of the electronic medical record and investigating how to improve our scheduling practices so as to best meet the needs of our patients and fully utilize practitioner time for patient care.
PPC in the Community Health Center Setting

- PPC has helped clarify the fact that change, whether large scale in nature (e.g. Chronic care model) or small scale (e.g. improving check-in process) has to start with a thorough understanding of our current condition and the willingness to work through rapid, small tests of change toward the goal of organizational transformation.
Mapping a Pathway for a PECS form

**WHO?**

- Front desk
- Nurses
- Front desk
- RN/MA
- MD/Provider

**WHAT?**

- Prints out form day before visit, gives to RN
- Huddle with MD to determine what labs, shots are needed, and if labs have been done but not captured in PECS, gives to front desk
- verify when pt. arrives that demographic info in PECS is correct-attaches PECS to encounter form, checks to see if dental visit done at LLFHCC
- rooms pt., gets HbA1C and other labs due, updates immunizations
- updates med list and diagnosis list on PECS forms, does self-management goal setting, orders other needed labs, referrals.

Data Entry Person enters data into PECS, adds form to Medical Chart or Shreds.
Understanding Your Current Condition of PECS Form

- PECS Form, appropriately implemented into your workflow processes, will facilitate ease of use in the collection of data -- increasing the efficiency of your staff to perform data collection with PECS.

- Many health centers fail to understand how the PECS form assists staff with strong visual cues and alerts that support staff to effectively perform their role or function that impacts patient care.
Understanding Your Current Condition of PECS Form

- Process Mapping your current condition and workflow provides first step to analysis of how to implement the PECS Encounter Form in your unique health center setting.

- Each staff member understanding their role then understands how the PECS form will drive “Highly-Specified Work” that must be completed during each patient visit.
Pittsburgh Regional Healthcare Initiative

- Training in the Toyota Principles/Lean Thinking, Perfecting Patient Care (PPC), a five day seminar is offered through week-long training sessions held in Pittsburgh, PA. Additionally, one day seminars known PPC 101 are available. Training can be hosted by your organization and local area.

- More information about Perfecting Patient Care (PPC) University and the work of the Pittsburgh Regional Healthcare Initiative (PRHI) is available: www.prhi.org

- Download a free article on this work at: http://prhi.org/pdfs/ACF28EB.pdf#search=%22Toyota%20Production%20and%20Health%20Care%22
Resource List

Institute for Healthcare Improvement
(www.ihi.org)

Download Free White Paper on Lean:
Going Lean In Healthcare, by James Womack
http://www.ihi.org/IHI/Results/WhitePapers/GoingLeaninHealthCare.htm
For more generalized knowledge of Lean Principles, please contact Lean Enterprise Institute at:

http://www.lean.org/

This organization publishes a book, _Lean Lexicon: a graphical glossary for Lean Thinkers_, to assist organizations in understanding key terminology used in Lean Thinking. It is available at their bookstore.
Resource Book List

- Stop Rising Healthcare Costs Using Toyota Lean Production Methods: 38 Steps, Lynn Kelley

- Toyota Production System, Taichi Ohno
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