

# Applying Lean Lessons in Health Care

## California Improvement Network

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# Outline

1. Background
2. Study aims, design & methods
3. Case study: Virtua Health
4. Brief findings
5. Factors influencing success

# Project Team

## **Project team:** American Institutes for Research

- **AIR:** Kristin Carman, Kathryn Paez, Steven Garfinkel, Lauren Smeeding, Jennifer Stephens, Callan Blough
- **Urban Institute:** Kelly Devers
- **Mayo Clinic:** Michelle Hoover, Andy Kollengoode, David Mapes, Tony Spaulding

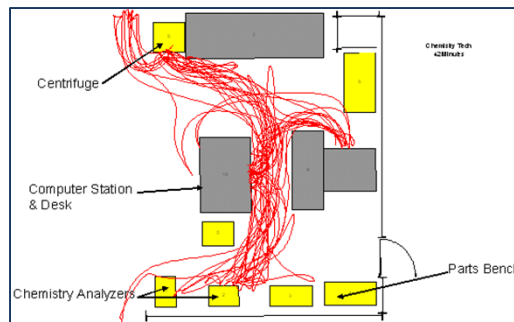
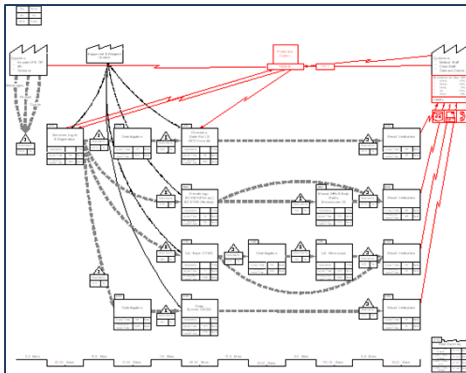
## **Funders:**

- Agency for Healthcare Research and Quality (AHRQ), ACTION II
  - Michael Harrison, Dina Moss
- California HealthCare Foundation
  - Rosanna Tran, Melissa Schoen

# Background

# Background: Lean

- Lean is a process-redesign methodology adopted from Toyota Production Systems
- Empowers front-line staff to apply continuous quality improvement methods to reduce waste and enhance value in workflows and operations
- Has shown promise to improve quality, efficiency, and safety in various health care settings



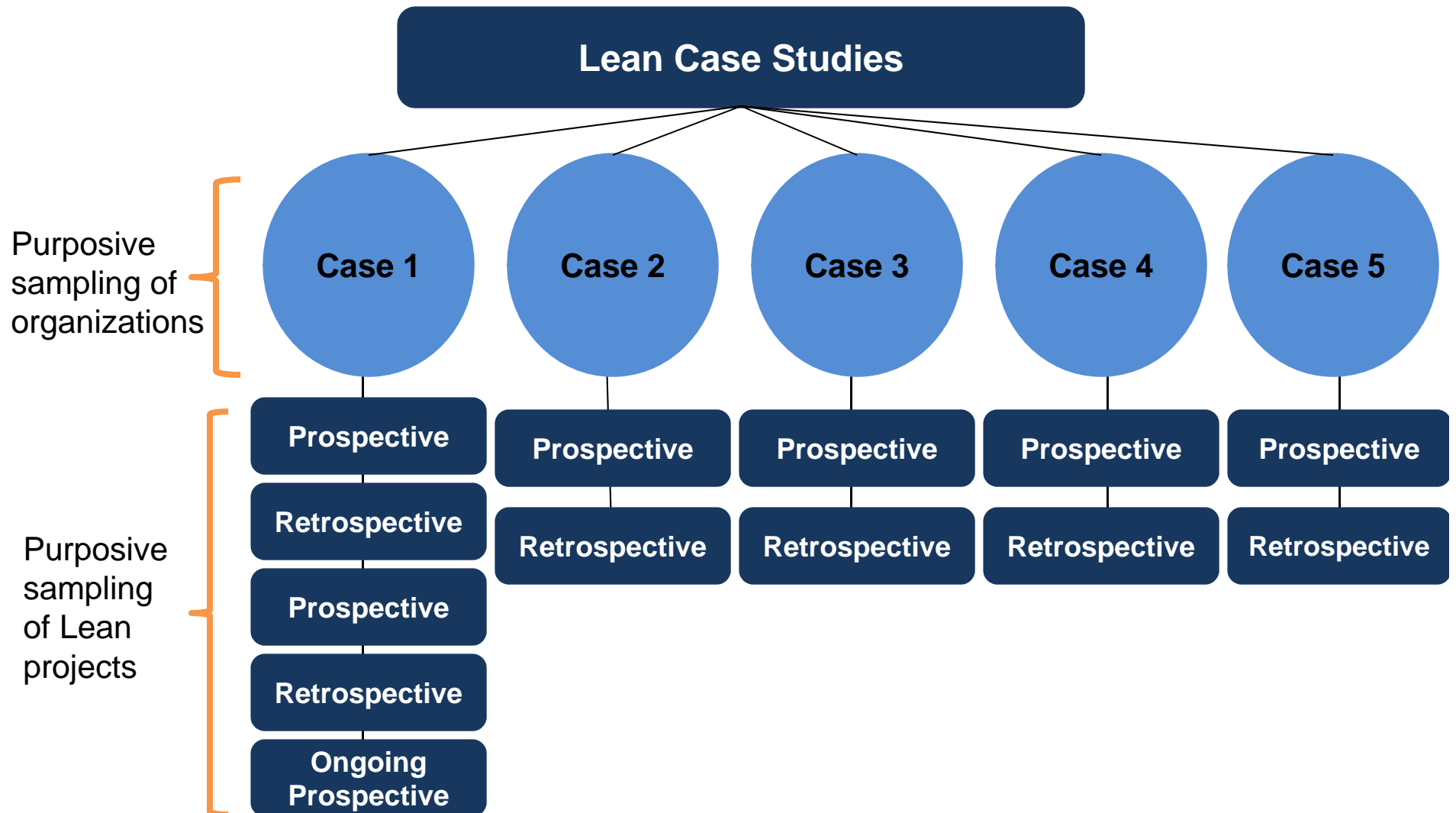
These three small pictures on the bottom of the slide depict three popular Lean tools: Value Stream Mapping, Spaghetti Diagramming, and 5S, a tool to organize workspace.

# Study Aims, Design & Methods

# Aims

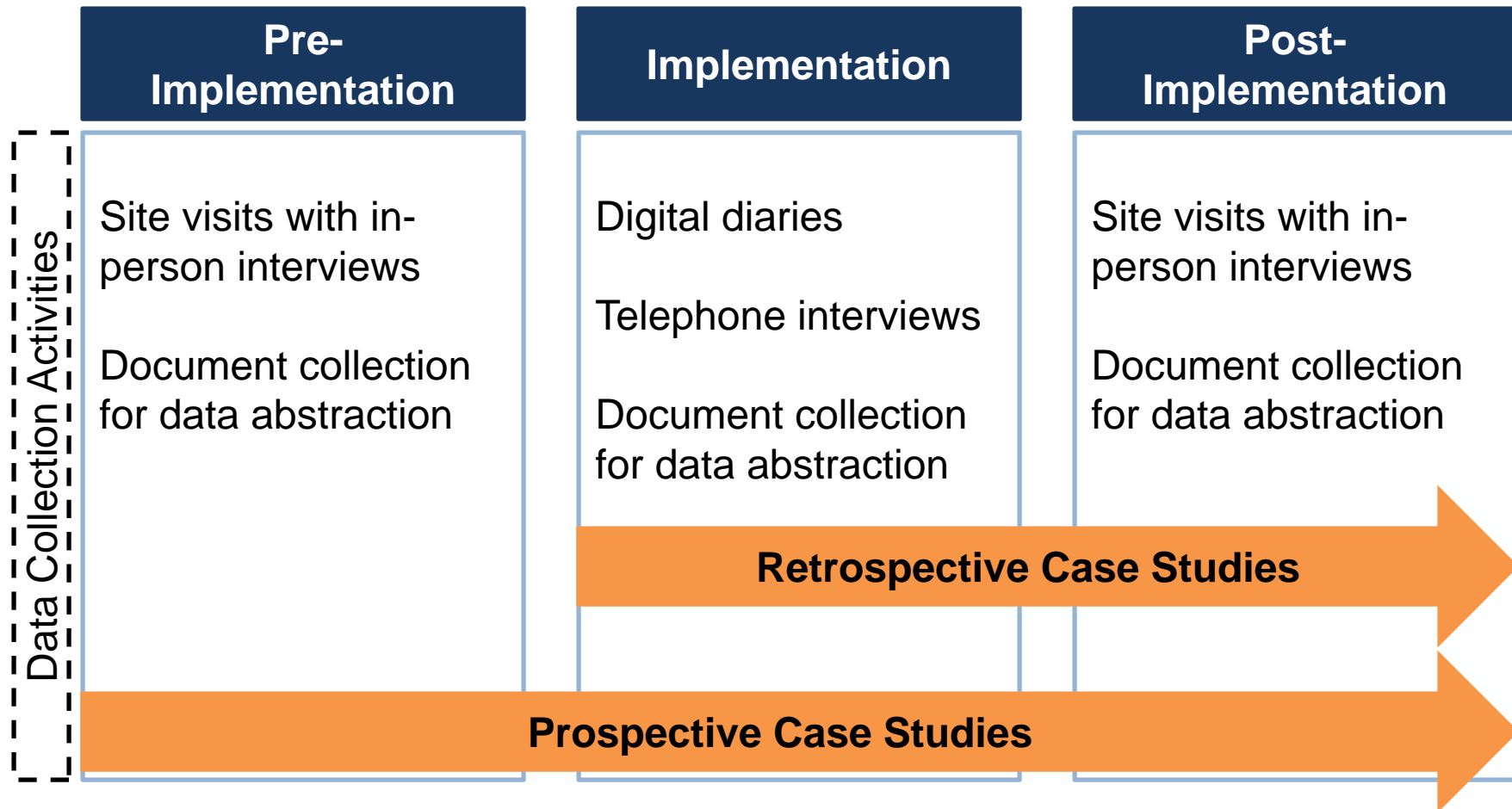
- **AIM 1:** Assess whether Lean positively affects primary outcomes of interest to the participating hospitals
- **AIM 2:** Identify internal and external factors that are associated with variations in outcomes and processes
- **AIM 3:** Identify challenges to implementing Lean, potential solutions, and lessons learned

# Design and Methods





# Data Collection



# Case Study – Virtua Health

# Opportunity & Goal Statements

## Background

FHC provides non-emergent care to patients from newborns to geriatric. Some 80 to 100 patients are cared for by up to 5 providers, 4 nurses, 4 registrars, additional support staff for MR, billing, intake and referrals. In addition, FHC has many contracts with outside companies (V@W, Camden City DYFS, Kit, Insight, Capital, etc.)

## Problems

1. Overall patient turn-around time is significantly above scheduled time
2. Registration process and associated waiting time can take up to 20 minutes
3. Phone system is inadequate and confusing
4. Inefficient movement of patient charts

## Goals

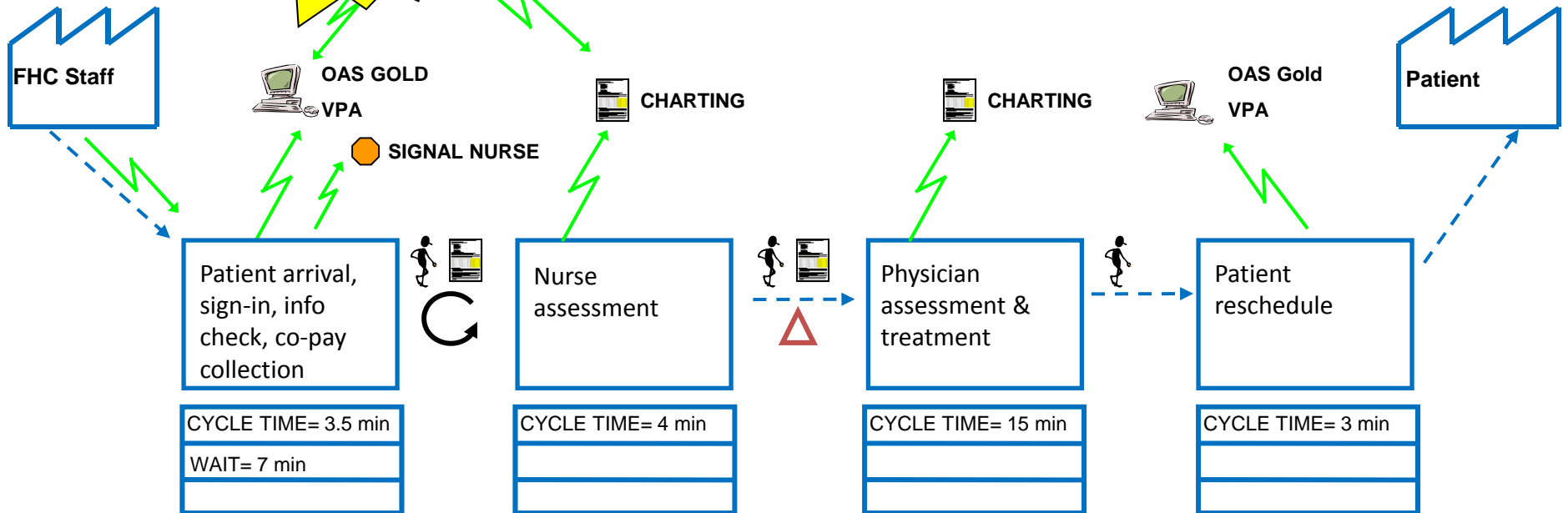
1. Reduce patient turn-around time
2. Improve processes to enhance productivity
3. Streamline medical record flow
4. Evaluate, design, and update the phone system

# High Level – Value Stream Map

20% underutilization  
18% over-processing

**Medical Record Chart Flow**

Takt Time = 5 mins/patient  
65-100 patient visits/day



2 Registrars

3-4 Nurses

4-5 Providers

2 Registrars

VA

3.5 minutes

4 min

14 min

3 min

NVA

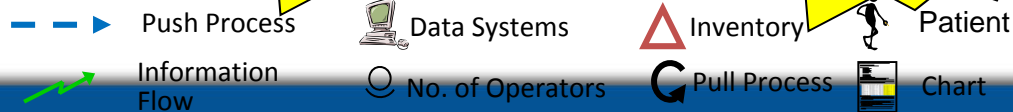
7 min

7 min

14 min (3-50 min)

\* Sample Size: 20 patients

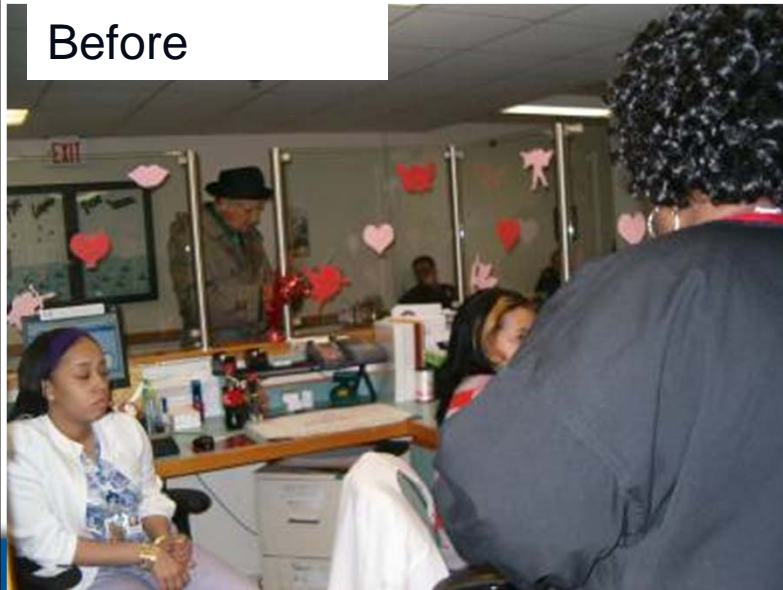
<b>Total VA Time</b>	: 24.5 Mins
<b>Total NVA Time</b>	: 28 Mins
<b>Cycle Time</b>	: 52.5 Mins



# Kaizen Impact

Operation	Problem	Actions taken	Results
Registration & Intake	<ul style="list-style-type: none"> <li>• Getting backed-up during times of high patient volumes</li> <li>• Too many phone calls/messages – not enough lines causing patient dissatisfaction</li> </ul>	<ul style="list-style-type: none"> <li>• Flexing/rotating registrars (Level-loading) with all phones lighting up at the front registrar locations</li> <li>• Hand stickies from sign-on board to the back-end</li> <li>• Included everyone in the decision making process</li> <li>• Intake sheets updated</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced queuing → 2 minutes saved/patient</li> <li>• Identified that 4 registrars (daily) are required</li> <li>• Positive Communication</li> <li>• More space on intake sheets</li> </ul>
Provider schedules	<ul style="list-style-type: none"> <li>• Underutilization of available time in the morning</li> </ul>	<ul style="list-style-type: none"> <li>• Three appointments ‘double-booked’ for 8:15, 8:30, 8:45 during morning hours.</li> </ul>	<ul style="list-style-type: none"> <li>• Identified potential for 40 more patient encounters/week</li> <li>• Increased patient volumes slowed actual implementation</li> </ul>

Before



After

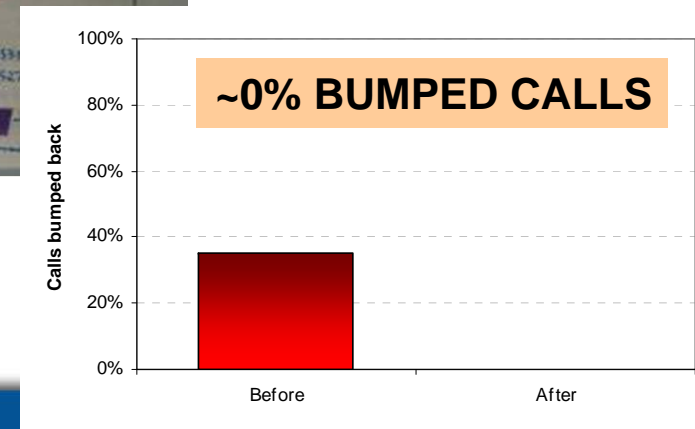


# Kaizen Impact

Operation	Problem	Actions taken	Results
Customer dissatisfaction with the phone system	<ul style="list-style-type: none"> <li>• Confusing/ convoluted phone system</li> <li>• Not enough number of phone lines to handle more than 2 calls at a time</li> </ul>	<ul style="list-style-type: none"> <li>• Updated/ revised the design of the phone tree</li> <li>• 4 extra lines unutilized will be distributed to different phones</li> <li>• Proposed 2 separate phone lines (Priority; 1 for SD appointments – doctors, voicemail for refills)</li> </ul>	<ul style="list-style-type: none"> <li>• Expected 50% reduction in transfer phone calls → Achieved 100% reduction in bumped calls</li> <li>• Expected increase in patient satisfaction by approx. 40% (current survey sample size too low)</li> </ul>

Before

After



# Kaizen Impact

Operation	Problem	Actions taken	Results
Medical Records workflow	<ul style="list-style-type: none"> <li>• Significant amount of time spent looking for charts</li> <li>• Lost charts, Missing &amp; unfilled lab results (long turn-around-time to file charts)</li> </ul>	<ul style="list-style-type: none"> <li>• “Out-guides”</li> <li>• Alpha cart for organization</li> <li>• Bins for loose papers</li> <li>• Presented staff with proposal to use ‘downtime’ to assist in MR</li> <li>• Filing Labs into charts as they come in</li> <li>• Extended floor at the steps to reduce motion &amp; effort</li> </ul>	<ul style="list-style-type: none"> <li>• More organized workspace</li> <li>• Cooperation amongst FHC team</li> <li>• Time spent looking for charts reduced from 15 minutes/5 charts to 3mins/5 charts</li> <li>• 88% of all charts are now sorted prior to being brought back to MR</li> <li>• Time to file charts reduced from 90 minutes to 20 minutes</li> <li>• Additional time available for filing labs – increased efficiency</li> <li>• Faster TAT for getting labs to the providers</li> </ul>

Before



After



# Brief Findings



# Implementation

- **Projects selected by executive level teams**
- **Consultants used by all organizations for implementation, at a minimum to begin the process**
- **Most organizations had staff dedicated to Lean facilitation and training**
- **Training on Lean concepts occurred prior to or at start of Lean event**
- **Lean events lasted from 1 to 4.5 days**

# Outcomes

- Substantial improvements in efficiency
- Some decreases in costs, but mostly unmeasured
- Some improvements in continuity of care, but minimal in clinical process measures or outcomes
- Moderate impacts on organizational culture
- Major reported impacts on *employee* satisfaction

# Important Contextual Factors

- Tradition of performance improvement
- Organization size
- Physician employment model

# Factors Influencing Success

# Leadership Support & Activities

## Factors for success:

- Setting direction from the top, while generating solutions from the bottom
- Maintaining a public focus on Lean regardless of resistance or major obstacles
- Responsiveness when Lean implementation challenges arose
- Commitment to no lay-offs

The very first thing we hear is, “Are we going to lose our jobs?” And of course, the CEO says, “No one’s going to lose their job.” And he repeats that over and over.

- Department Manager

# Alignment with Organizational Strategy

## Factors for success:

- Align with the organization's overall strategic plan, staff's concerns, incentives, and other process improvement methods
- Embed in a culture change strategy
- Integrate into leadership development and promotion
- Incentivize to encourage participation
- Implement physician engagement strategy
- Do not replace other process improvement methods

Physicians were participants right out of the get-go. Some of them thought that the processes and the didactics were long. They think we could move faster... Do we need to come to class for four days in a row to really get something like this? But I think all of them felt that the tool itself and the approach was valuable.

- Senior Executive

# Scope and Pace

## Factors for success:

- In early phases, implement projects that have a narrow, well-defined scope
- Plan carefully for transition from administrative to clinical projects
- Lean projects that lead to an IT solution require careful planning and coordination

IT can stall... It can do that because the work that we do here is so integrated with the computer we don't have paper charts. We do not have paper records. And all the work flows that the departments use are ultimately they test something it has to get into the computer system somehow or some way.

- Department Manager

# Learning Organizations

## Factors for success:

- As projects become more complex, need become a “learning organization”

Characteristics	Definition within the Context of Lean
<b>Systems Thinking</b>	Examining the interrelationships between work processes to understand if and where waste is occurring
<b>Personal Mastery</b>	Individuals are in a continual learning mode to sharpen skills for applying Lean techniques to reduce waste and improve efficiency
<b>Mental Models</b>	Fostering openness and challenging assumptions to think about sources of waste and ways to reduce waste in a new way
<b>Shared Vision</b>	A shared vision for a Lean organization that fosters commitment to continuously apply Lean thinking to the work at hand
<b>Team Learning</b>	Lean teams collaborating to attain insights into sources of waste and ways to reduce waste not possible individually



# Resources

## Factors for success:

- Lean requires a significant investment of resources at startup and, more modest investments, thereafter
  - Consultants
  - Staff time (executive, managers, front-line)
  - Capital
  - Measurement/data collection

# Conclusions

Lean can be effective in improving efficiency, reducing costs, and, in some cases, improving quality.

**\*\*\*However, success is not automatic.\*\*\***

## **Organizations must be willing to commit:**

- Leadership time, focus and patience
- Thoughtful execution: alignment with overall organizational strategies, kick-off with the “right” projects, evolve to become a learning organization for the tougher projects
- Resources