

# An Overview of Lean

## A Guide for the Small Rural Hospital Improvement Grant Program

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## INTRODUCTION

Lean manufacturing, Lean thinking or Lean production, simply referred to as "Lean," is a practice that considers the expenditure of resources toward goal accomplishment that does not create customer value to be creating waste, and therefore targeted for elimination. Lean provides a set of tools to assist in identifying waste that can be eliminated. As waste is eliminated, quality improves while production time and cost are reduced. Lean focuses on getting the right things to the right place at the right time in the right quantity to achieve perfect work flow, while minimizing waste and being adaptable to change.

Another way to describe Lean is simply using less to do more. Lean started out as a philosophy for manufacturing companies. Although health care is quite different than manufacturing, both rely on complex processes to accomplish tasks and provide value to the customer or patient and many of the concepts of Lean are translatable to health care. (Institute for Healthcare Improvement 2005). A Lean hospital is an organization that looks at everything from the patient's point of view.

### **Lean philosophy for health care is focused on:**

- Defining value in the eyes of the patients
- Eliminating wasteful steps that add no value to the organization
- Creating flexibility and agility to meet the changing needs of the patient and industry
- Empowering frontline staff by incorporating easy problem-solving tools to use daily
- Doing more with less

### **Utilizing Lean in health care can potentially:**

- Reduce costs by 35-30%
- Improve work and patient flow
- Improve patient and non-patient care processes
- Improve morale, productivity and the bottom line (Roberts 2013)

Remember that the ultimate goal is to become a better health care provider. When considering implementation of Lean in health care, the common theme is, "work smarter, not harder". Health care organizations that have successfully implemented Lean demonstrate workflow processes that are simple and meaningful, eliminate waste and improve productivity and patient care. The end result is a cultural transformation that aligns strategy, culture and execution that can improve internal and external communications, reduce staff stress and tensions, increase patient satisfaction and provide overall cost savings to an organization (National Rural Health Resource Center 2010).

## KEY CONCEPTS OF LEAN THINKING

The overarching key concept in Lean thinking is 'value'. Value is defined as the capability to deliver exactly the product or service a customer wants with minimal time between the moment it is asked for and the actual delivery at an appropriate price (Joosten, Bongers and Janssen 2009).

There are five overriding key concepts to Lean:

### 1. Identify Customers and Specify Value

Recognize that only a small fraction of the total time and effort in any organization actually adds value for the end customer. Clearly define value for a specific service from the patient's perspective, and all the non-value adding activities - or waste - can be targeted for removal. By defining 'what customers want', process steps can be divided into value-adding and non-value-adding. Value-adding activities contribute directly to creating a product or service a customer wants. Non-value-adding activities do not and are called waste. Of course, waste needs to be removed or avoided (Joosten, Bongers and Janssen 2009).

It is value that determines how much money someone is willing to pay for the product and services. It is the company's job to eliminate waste and cost from the processes so that the customers price can be achieved at great profit to the company.

Lean gives us specific rules to use in determining what activities are value-added or non-value-added:

- Rule 1: The customer must be willing to pay for the activity
- Rule 2: The activity must transform the product or service in some way
- Rule 3: The activity must be done right the first time (Lote 2012)

### Examples of value-added activities (VA) and non-value-added activities (NVA) in a health care setting:

Department	Role	VA	NVA
Operating room	Surgeon	Operating on a patient	Waiting for delayed procedure or performing unnecessary steps
Pharmacy	Pharmacy Technician	Creating an IV formulation	Reprocessing medications that were returned from patient units
Inpatient unit	Nurse	Administering medications to a patient	Copying information from one computer system into another
Radiology	Radiology Technician	Performing a MRI procedure	Performing a medically unnecessary scan
Emergency room	Patient	Being evaluated or treated	Waiting to be seen

(Lote 2012)

## 2. Identify and Map the Value Stream

The value stream is the entire set of activities across all parts of the organization involved in jointly delivering the product or service. This represents the end-to-end process that delivers the value to the customer. Once it is understood what the customer wants, the next step is to identify how it will be delivered. A clear understanding of the value stream as well as an understanding of its value-add and waste is needed. Once you have a clear understanding of those components, then understanding of the waste associated with the delivery of a product and/or service comes about. Lean thinking advocates supplier and customer partnership and radical supply chain management to eliminate waste from the entire value stream.

## 3. Eliminate Waste

Typically when the value stream is initially mapped, it is often found that only 5% of activities add value, or even as much as 45% in a service environment. Eliminating this waste ensures that product or service “flows” to the customer without any interruption, detour or waiting.

### Types of Waste in Health Care Settings

- a. Transportation – Movement of a product or service that does not add value such as transporting patients, equipment or products or the retrieval or storage of files.
- b. Inventory – Having more materials on hand than the patient needs adding costs and resources that do not meet the demand.
- c. Motion – The unnecessary movement of people or equipment such as searching, reaching, stacking, clearing or walking.
- d. Waiting – Idle time created due to unnecessary waiting for people, equipment, beds or information causing bottlenecks, downtime or lack of continuity.
- e. Overproduction – Producing more than the patient needs costing money and consuming resources.
- f. Overprocessing – Providing products above the patient’s standards that don’t add any value and consume additional resources such as ordering a CT scan when an x-ray will suffice.
- g. Defects – Work resulting in errors, rework, rescheduling and re-inspecting interrupting flow and resulting in a loss of time. Examples include medication errors, missing documentation or missing equipment (Lin 2012).

## 4. Flow

Flow is about understanding the customer, or patient, demand on the service and then creating a process to respond to this. Flow is a significant key to the elimination of waste. If the value chain stops moving forward for any reason, then waste will be occurring. The trick is to create a value stream that does not stop in the process. Each aspect of production and delivery needs to be fully synchronized with the other elements. Carefully designed flow across the entire value chain will tend to minimize waste and increase value.

## 5. Strive for Perfection

Striving for perfection begins when flow is implemented with radically reorganizing individual process steps, but the gains become truly significant as steps link together. As this happens more and more layers of waste become visible and the process continues towards the theoretical end point of perfection, where every asset and every action adds value for the end customer. The idea of total quality

management is to systematically and continuously remove the root causes of poor quality from the production processes so that the plant and its products are moving towards perfection. This relentless pursuit of the perfect is key attitude of an organization that is "going for Lean" (BMA Inc n.d.).

A new culture in the organization will emerge with strong leadership to implement these five principles of Lean. By driving towards the overall organizational strategy with constant review of processes, this will ensure that the organization is constantly and consistently delivering value to the customer. This allows the organization to maintain its high level of service while being able to grow and adapt to a changing environment (Cardiff University n.d.).

## **STEPS TO ACHIEVE LEAN SYSTEMS**

The following steps should be implemented to create the ideal Lean system:

1. Start by designing a simple system for one area of the hospital
2. Recognize that there is always room for improvement
3. Continuously improve the Lean system design

### **Design a Simple System**

A fundamental principle of Lean manufacturing is demand-based flow. In this type of setting, inventory is only pulled through each production center when it is needed to meet a customer's need. The benefits of this goal include:

- Decreased cycle time
- Decreased inventory
- Increased productivity
- Increased capital equipment utilization

### **There is always room for improvement**

The core of Lean is founded on the concept of continuous product and process improvement and the elimination of non-value-added activities. The value-adding activities are simply only those things the customer is paying for, everything else is waste, and should be eliminated, simplified, reduced or integrated. Improving the flow of material through new ideal system layouts at the customer's required rate would reduce waste in material movement and inventory.

### **Continuously Improve**

A continuous improvement mindset is essential to reach the organization's goals. The term "continuous improvement" means incremental improvement of products, processes or services over time, with the goal of reducing waste to improve workplace functionality, customer service or product performance.

Stephen Shortell (Professor of Health Services Management and Organizational Behavior – Berkeley University, California) states:-

"For improvement to flourish it must be carefully cultivated in a rich soil bed (a receptive organization), given constant attention (sustained leadership), assured the right amounts of

light (training and support) and water (measurement and data) and protected from damaging."

## Measure

Overall equipment effectiveness (OEE) is a set of performance metrics that fit well in a Lean environment.

### ➤ Make Lean Transformation Successful



(Auburn Works n.d.)

All of these concepts have to be understood, and embraced by the employees who own the processes that deliver the value. The cultural and managerial aspects of Lean are possibly more important than the actual tools or methodologies of production itself. There are many examples of Lean tool implementation without sustained benefit, and these are often blamed on weak understanding of Lean throughout the whole organization. For more information on how to incorporate successful change in your organization, visit [Kotter's 8-Step Change Model](#).

## RESOURCES

### Additional Lean Resources

National Rural Health Resource Center

Provides information on Lean resources, training events, recorded webinars and hospital success stories.

### Going Lean in Health Care

Institute for Healthcare Improvement (IHI)

Outlines how Lean principles have been used effectively to the delivery of health care.

Includes information about the key concepts in Lean thinking and how to apply Lean thinking to health care.

### [Lean Hospitals](#)

Provides downloadable Lean health care forms including checklists and planning worksheets. Also includes Six Sigma forms.

### [Lean Hospitals: Six Sigma and Lean Healthcare Forms](#)

Agency for Healthcare Research and Quality (AHRQ)

The AHRQ Health Innovations Exchange website provides information on both Lean and Six Sigma including downloadable forms, resources and hospital profiles.

### [Lean Six Sigma in Healthcare](#)

American Society for Quality (ASQ)

Provides information and tools on how to use Lean to make hospitals or clinics work more efficiently. Includes a knowledge center, case studies, trainings and conference information.

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