

Lean Healthcare

Healthcare Financial Management
Association

April 12, 2011

Why Change?

The Charge for Change in America's Healthcare System:

- “Performance is a system property”
- “To improve performance, you need a new system.”
- “Improvement and system change are related inextricably.”
- “The enemy is fragmentation.”

Don Berwick – CMS Administrator

High Reliability Organization

Reliability: Defined as a failure-free operation over time.

Reliability is measured in this way:

$$\text{Reliability} = \frac{\text{Number of actions that achieve the intended result}}{\text{Total number of actions taken}}$$

“If the right care has five elements and the medical team accomplishes all five only 90 percent of the time, that’s 100 percent failure for each of the 10 percent of patients who don’t get all the recommended care. There is no partial credit for reliability.” – Roger Resar, MD

The Problem

“What is important is having all the elements together as a system. It must be practiced every day in a very consistent manner – not in spurts – in a concrete way on the shop floor.”

*Mr. Fujio Cho, Chairman
Toyota Motor Corporation*

Lean is a production system.

Process Thinking

- We traditionally see an organization as a collection of departments or activities, managed separately and with time buffers between them
- Performance is improved by setting targets, by switching managers and by restructuring
- ***Lean thinkers*** see an organization as a collection of customer, provider and support processes
- The task is to identify the value in each process, to see and manage the end-to-end flows and to synchronize the support flows

A Different Perspective Using Lean Thinking

- Waste: waiting, motion, errors -Muda
- Uneven workload, variability -Mura
 - Busy Monday, light Friday
 - ORs, inpatient beds
- Stress of overburden -Muri
 - Physicians, nurses, clerks, managers running faster
 - Nurse and physician shortage

Lean Thinking Can Help

- Decrease patient wait times
- Improve documentation and reporting accuracy and efficiency
- Improve operating room turnover
- Increase contact time with patients through an elimination of unnecessary administrative functions
- Increase safety
- Improve patient satisfaction (↓ wait time, ↑ face time)
- Improve staff satisfaction (time, communication, ↑ participation)
- Improve quality (med errors, report)
- Decrease equipment breakdowns
- Faster response time.
- Reduced Costs
- Increase productivity (↑ time w/patient, ↓ search)
- Improve inventory effectiveness (\$, shortages, access)
- Improve JCAHO compliance

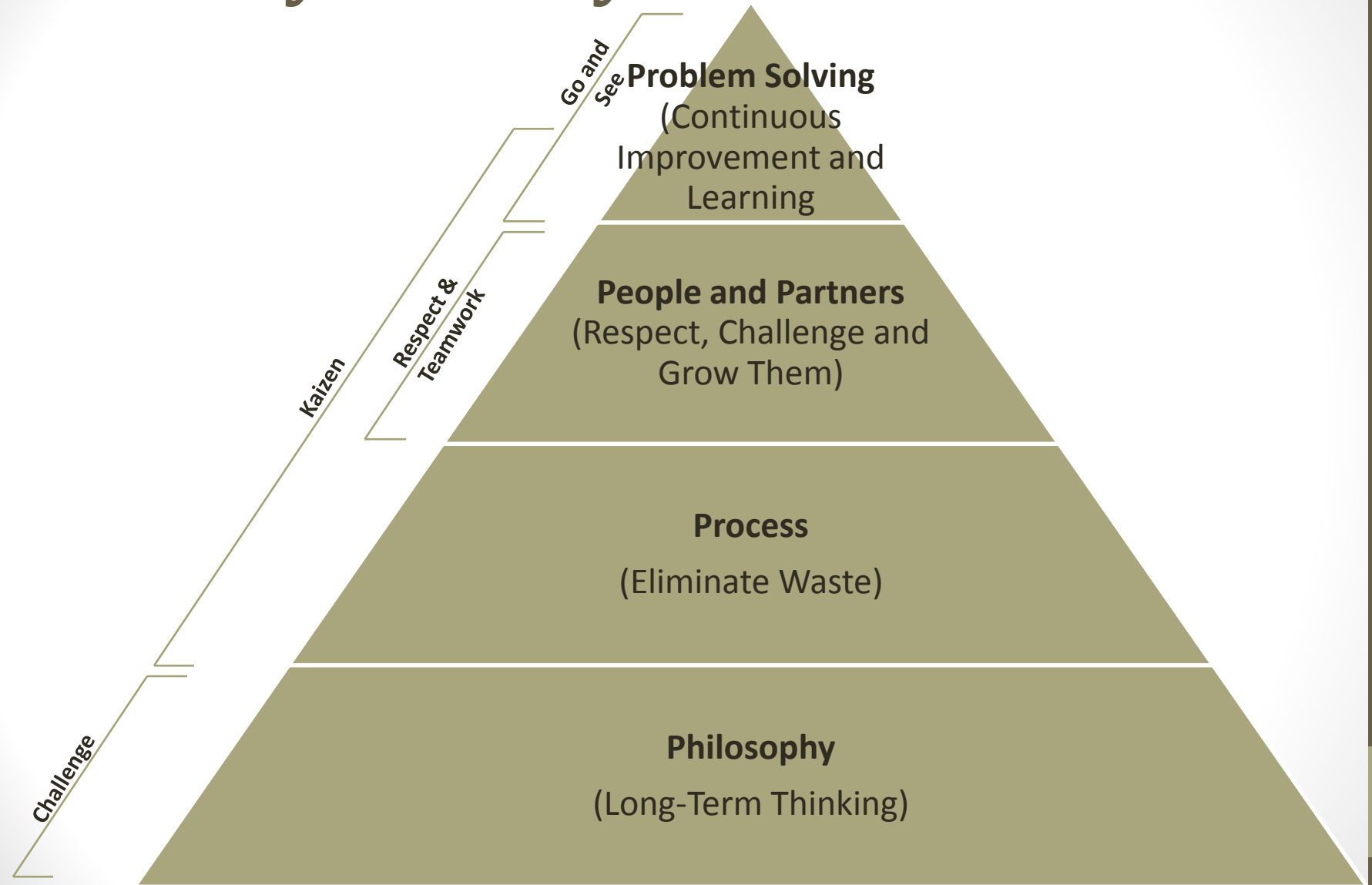
What Lean is NOT

- Simple FTE reduction
- Reducing resources & funding
- Band aid solutions & quick fixes
- Rigid, step by step program
- Addressing symptoms
- Individual efforts
- Departmental focus (silos)
- Large reports
- Justifying business cases or preconceived ideas
- Copying solutions from elsewhere

What Changes with Lean?

- Same plant
- Same equipment
- Same people
- ***Different management system***

The Toyota Way



Liker, J. (2004). The Toyota Way. McGraw-Hill. New York, NY.

How can we create (liberate) 1,300 problem solvers?

- Help each worker take initiative to find and fix causes of problems he/she faces daily
 - This means each of us has two jobs:
 - **Do the work**
 - **Improve the work**
- Manager's role:
 - Support improvement work (time, mentoring)
 - Align improvements so value flows to the customer

Modified from J. Shook

Impact of Lean

Validated Industry Averages*

Direct Labor/Productivity Improved	45-75%
Cost Reduced	25-55%
Throughput/Flow Increased	60-90%
Quality (Defects/Scrap) Reduced	50-90%
Inventory Reduced	60-90%
Space Reduced	35-50%
Lead Time Reduced	50-90%

* Summarized results, subsequent to a five-year evaluation, from numerous companies (more than 15 aerospace-related). Companies ranged from 1 to >7 years in lean principles application/execution.

What is Waste?

- Consuming more resources than are necessary to produce the goods, or service, that the customer wants
- **Pure Waste**: Actions that could be stopped without effecting the customer
- **Incidental Waste**: Actions that need to be done based on how the current system operates but do not add value



8 Wastes of Healthcare

- **Defects** - Work that is less than the level the customer (the next process) has requested
 - Medication error
 - Wrong patient
 - Wrong procedure
 - Missing information
 - Redraws
 - Poor clinical outcomes
- **Overproduction** - Producing more than the customer needs right now
 - Pills given early to suit staff schedules
 - Testing ahead of time to suit lab schedule
 - Treatments done to balance hospital staff or equipment workload

8 Wastes of Healthcare

- **Waiting** - Idle time created when material, information, people, or equipment is not ready
 - Bed assignment delay
 - Delay in admission to Emergency Dept.
 - Delays in testing, treatment, or discharge
 - Delay in patient lab test
- **Not Utilizing the Creativity of All Employees** – Any ideas that are not considered and implemented. Putting in employees in the wrong roles.

8 Wastes of Healthcare

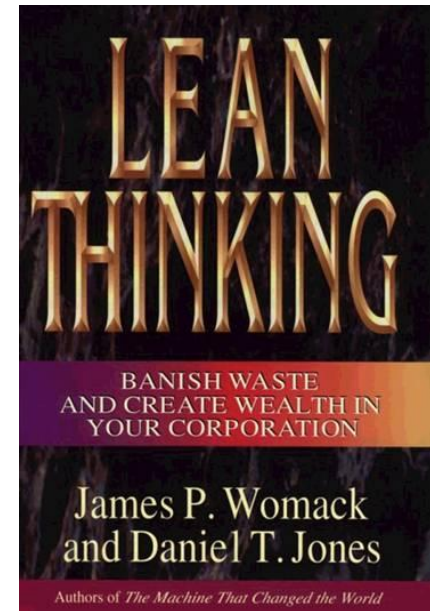
- **Transportation** - Movement of product that does not add value
 - Moving samples/specimens
 - Moving patients for testing
 - Moving patients for treatment
 - Moving patients to and fro
- **Inventory** - More materials, parts, or products on hand than the customer needs right now
 - Bed assignments
 - Pharmacy stock
 - Lab supplies
 - Specimens waiting analysis
 - Paperwork in process
 - Patients in beds
- **Motion** - Movement of people that does not add value
 - Searching for patients
 - Searching for meds
 - Searching for charts
 - Searching for orders
 - Gathering tools/supplies
 - Handling paperwork

8 Wastes of Healthcare

- **Extra Processing** - Effort that adds no value from the customer's viewpoint
 - Multiple bed moves
 - Retesting
 - Excessive paperwork
 - Unnecessary procedures
 - Multiple testing
- *The Science of Wasteology*
- Waste disguises itself as work and is difficult to distinguish from the real thing.

5 Steps of Lean Thinking

- Value:** What is the customer really buying?
- Value Stream:** How is value created & delivered?
- Flow:** Improve the value stream
- Pull:** Triggering every flow from actual demand
- Perfection:** Continuous improvement forever



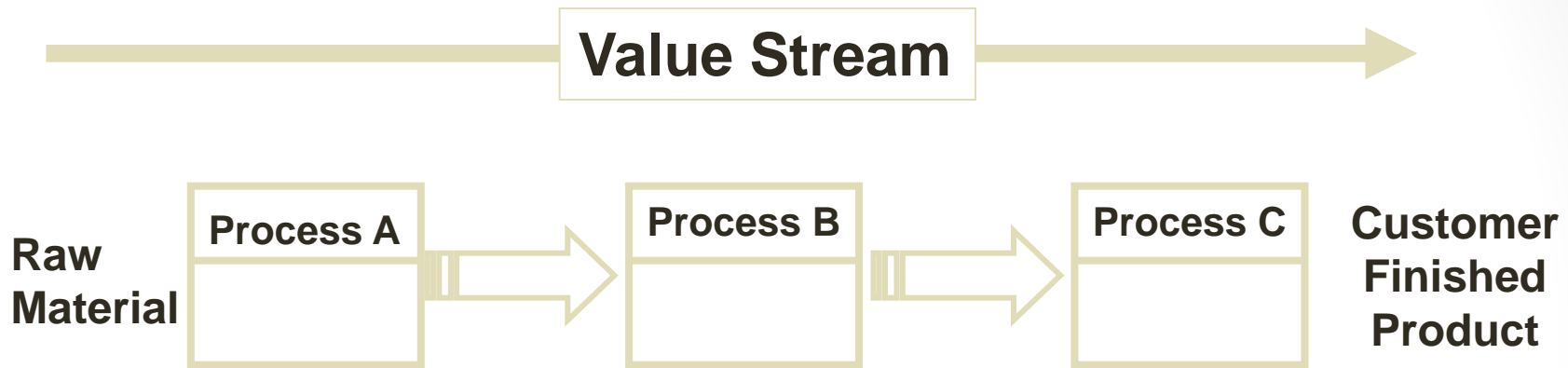
Specify Value for Our Customer(s)

- Providing the right product, at the right time, in the right quantity, at the right quality, at the right price, in the right place in accordance to the customer's requirements
- Usually value added steps lead to a transformation of the material from one form to another which gets the product closer to the customer's specifications
- “Where there is a product (or service) for a customer, there is a value stream. The challenge lies in seeing it.”

Value

- To be value-added, the action must meet all three of the following criteria:
 1. The customer must be able to see how the activity adds value to a product or enhances the service provided.
 2. The action or activity must be carried out correctly in the first instance.
 3. The action must somehow change the product or service in a particular way.
- Value can also be divided into three types of activity:
 - Value added
 - Non-value added but necessary
 - Non-value added or waste

Map the Flow of Value

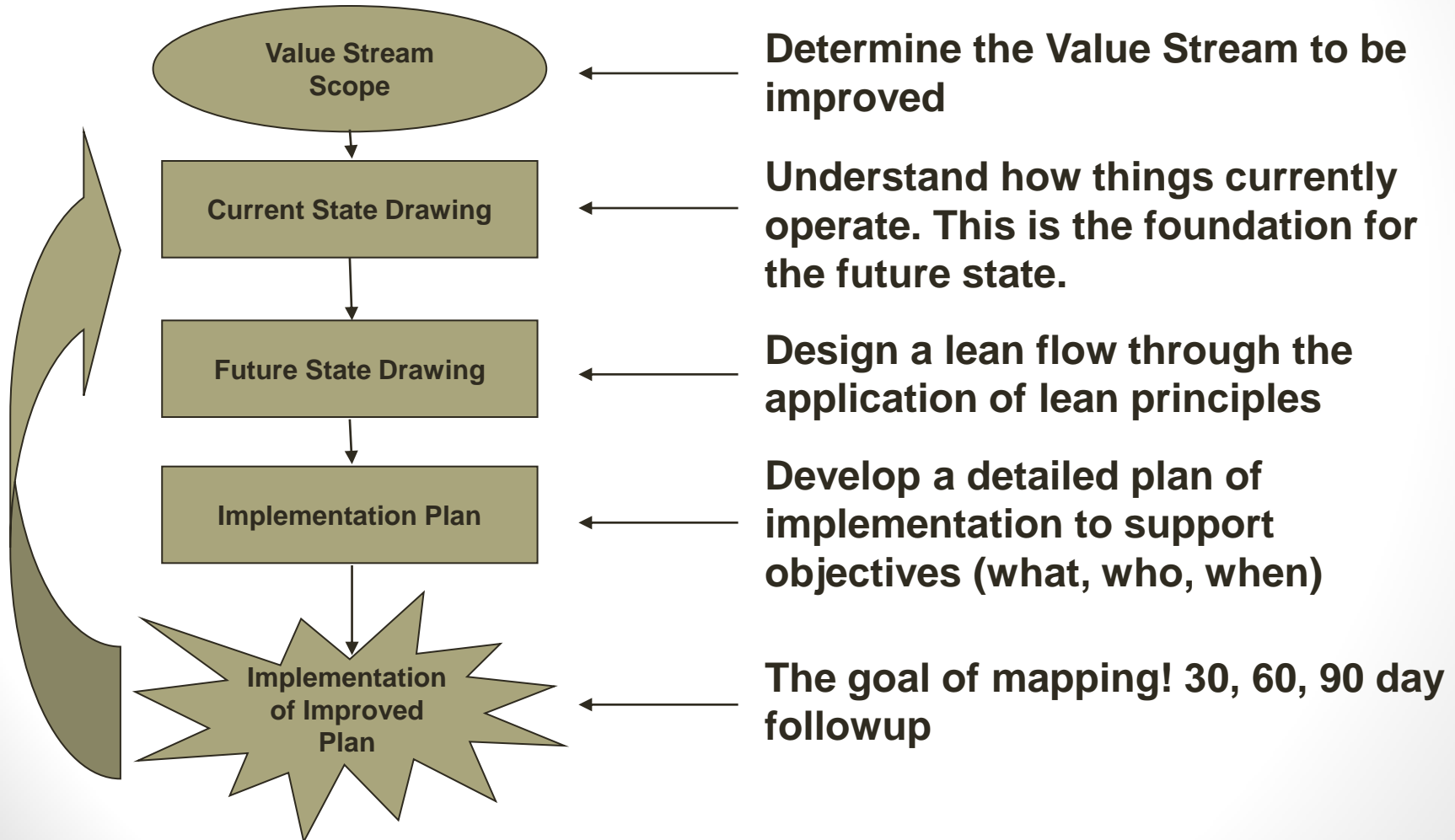


A value stream is all of the value-adding activity AND all of the non-value adding activity (pure waste and incidental waste) required to provide a product/service to a customer.

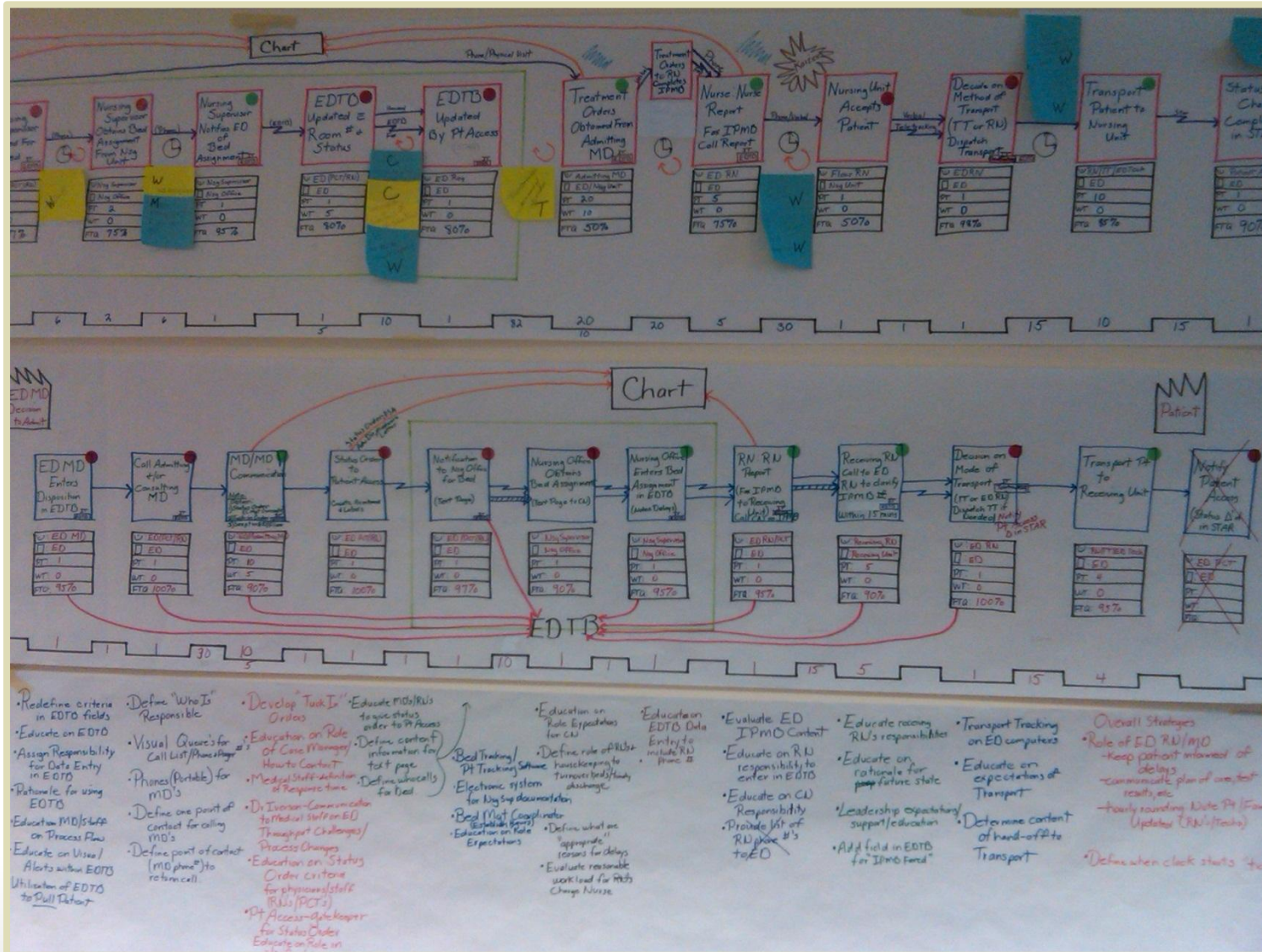
Healthcare Value Streams

- Primary Value Streams
 - Emergency Services
 - Surgical Services
 - Imaging Services
 - OB Services
 - Etc.
- Support Value Streams
 - Billing
 - Payroll
 - Medical Records
 - Housekeeping

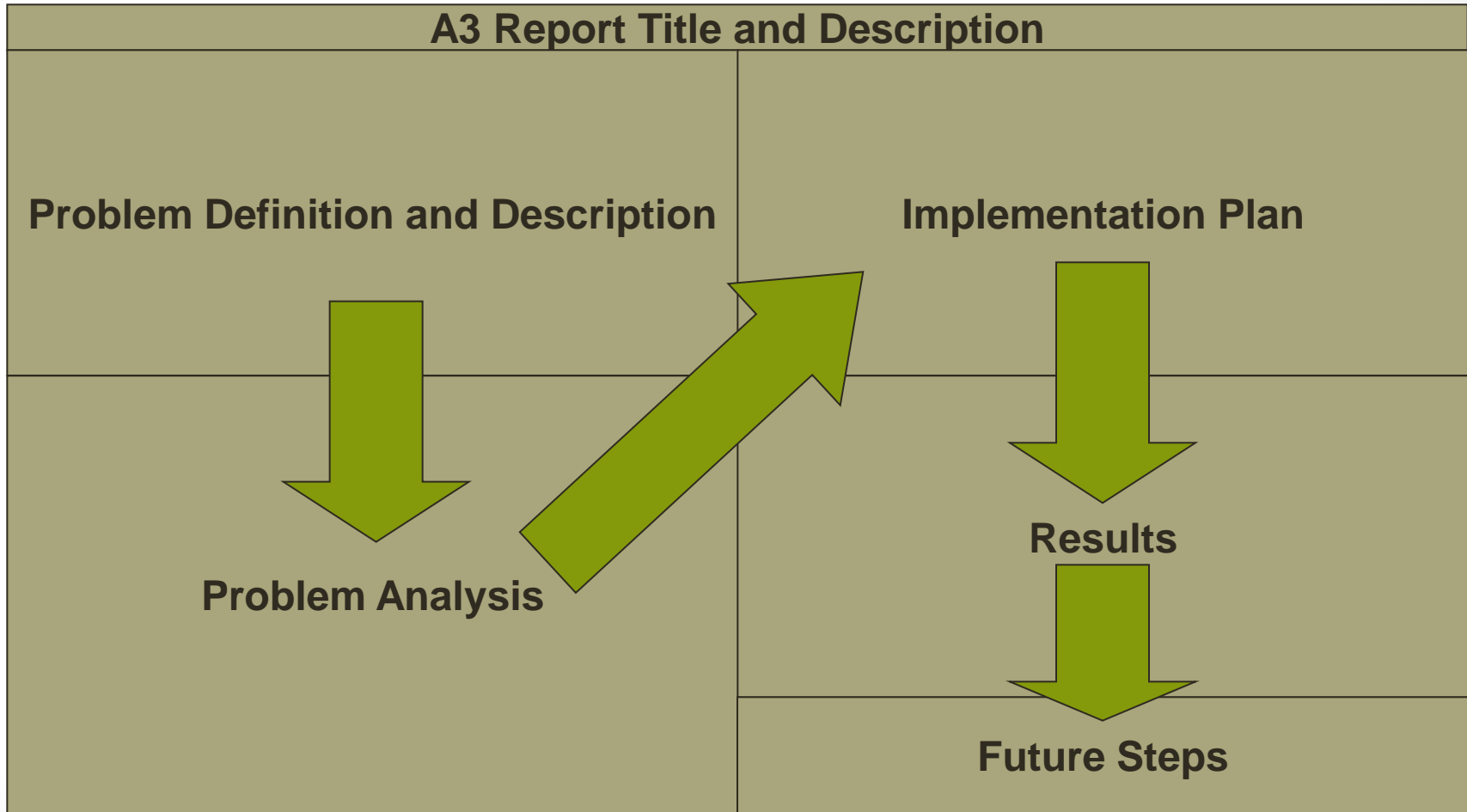
Value Stream Mapping Process



Value Stream - Current State & Future State



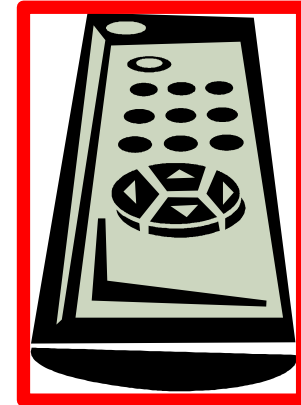
A3 Format & Flow



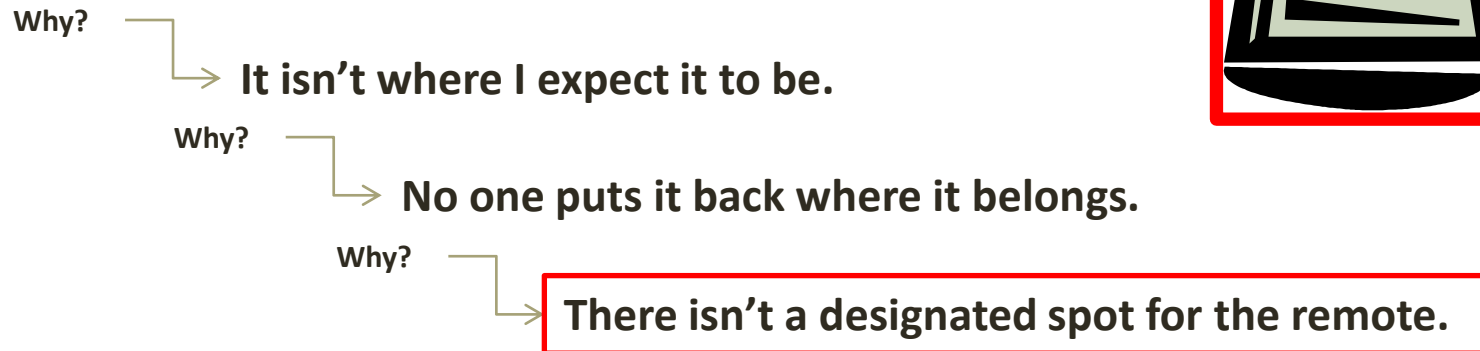
Meier, D. (2006). The Toyota Fieldbook. Mc-Graw-Hill. New York, NY.

Use the 5 Whys to Find Root Cause(s)

Attention Family: Place remote inside Red Box when finished watching TV!



Problem: I can never find the TV remote control!



- Continue 5 Why analysis until the question has been answered at least 3 to 5 times.
- Once the root cause is identified, the problem can be addressed.
- The problem may persist if it isn't addressed at the root cause.
- Workable solutions are the next challenge...

5S & Visual Mgmt

- **Sort and Scrap** (eliminate what is not needed)
- **Straighten** (organize what belongs)
- **Scrub** (clean up; see and solve problems)
- **Standardize** (determine who does what and how)
- **Sustain** (self-discipline; keep things in order)

What is a visual workplace: When anyone can walk into a workplace and visually understand the current situation.

5S



Before 5S



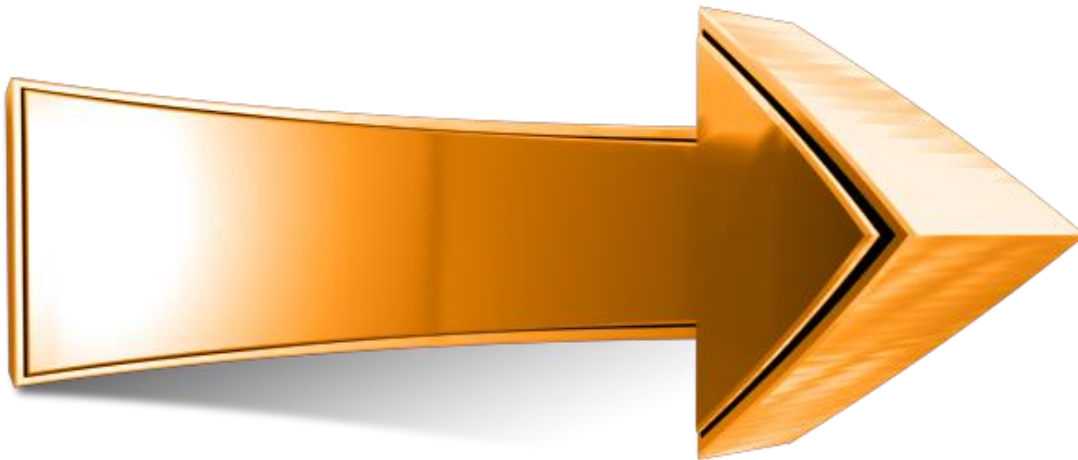
After 5S

Visual Management



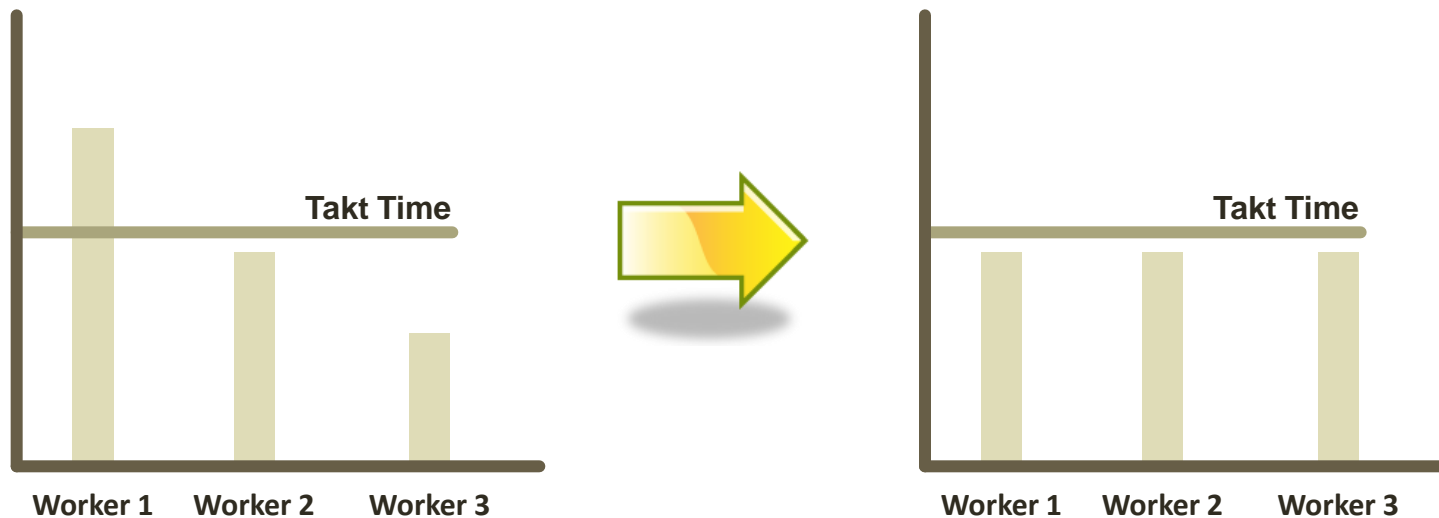
Flow

The progressive achievement of tasks along the value stream so that a patient proceeds from admitting to discharge in a safe manner with no waiting, delays, retesting, errors or needless transportation or paperwork.



Workload Leveling

- Workload leveling means evening out demand
- Doing more with less resources and ensure that we do not stress our resources unnecessarily
- If variability in workload cannot be leveled (e.g. ED), then match supply to demand



Takt time is the time in which a unit must be produced in order to match the rate of customer demand:

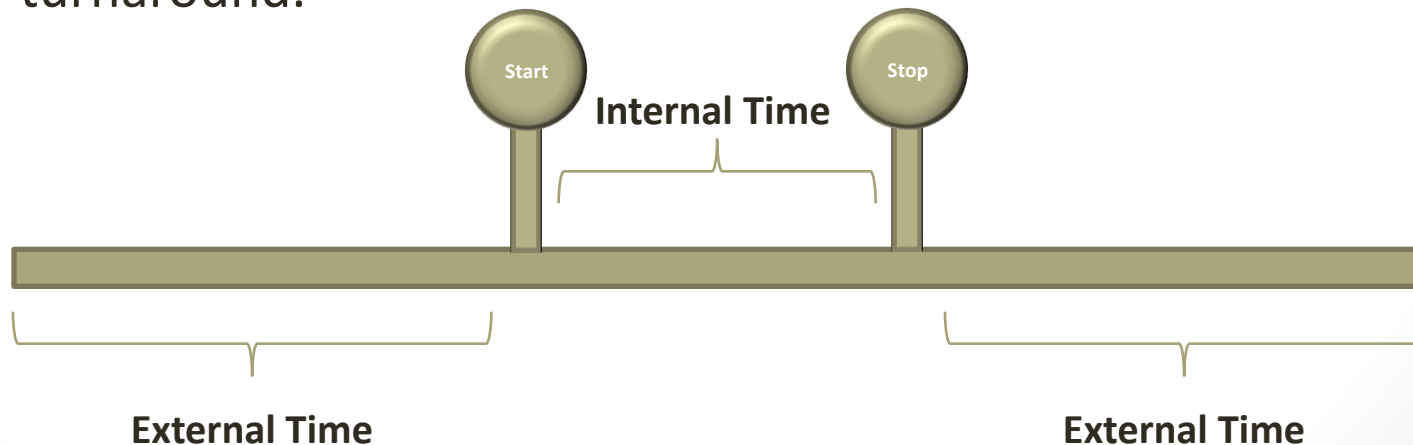
$$\text{Takt Time} = \frac{\text{Available daily production time}}{\text{Total daily quantity required}} = \frac{\text{Time}}{\text{Volume}}$$

Quick Setup Process Steps

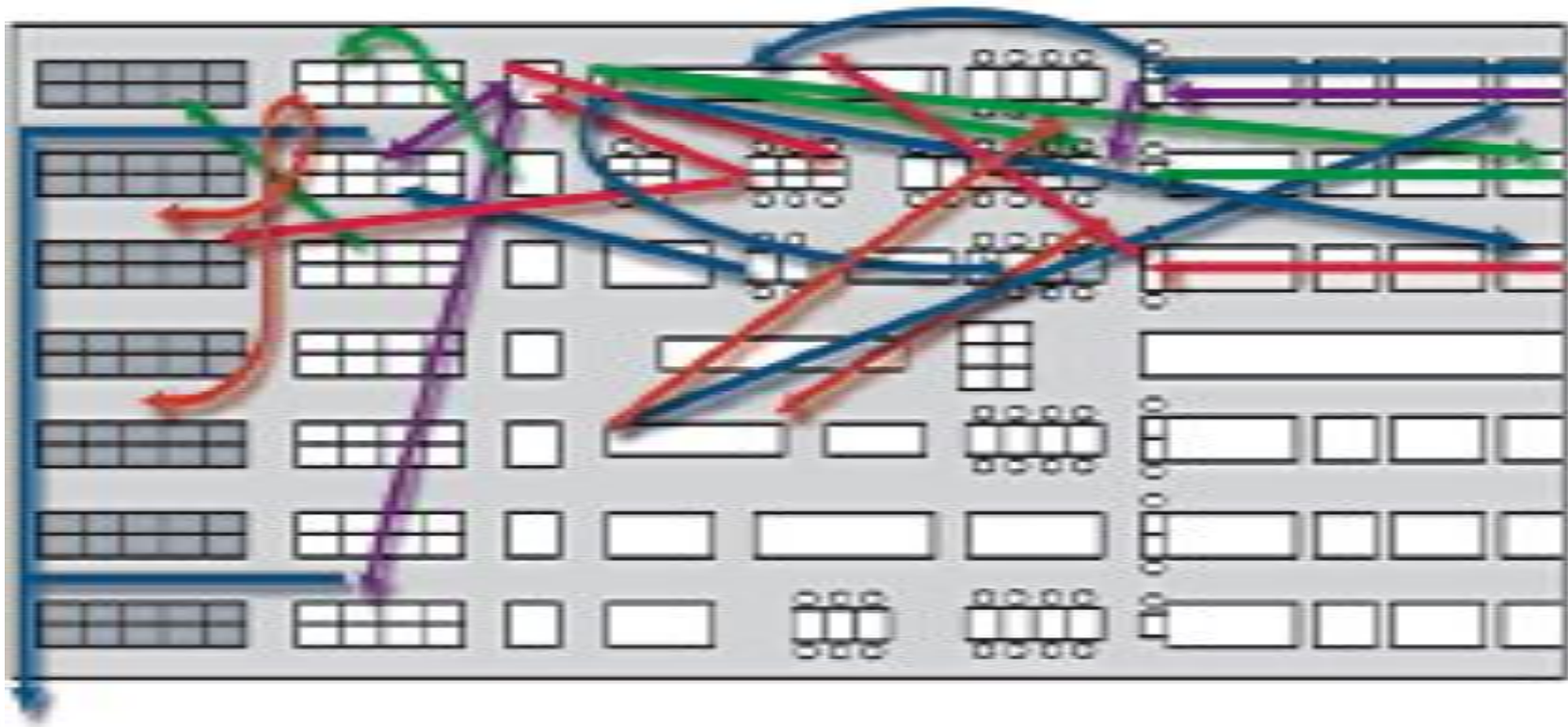
- Record current process steps (I,E)
- Shift I to E (before and after)
- Reduce I
- Reduce E
- Try to eliminate need for setup



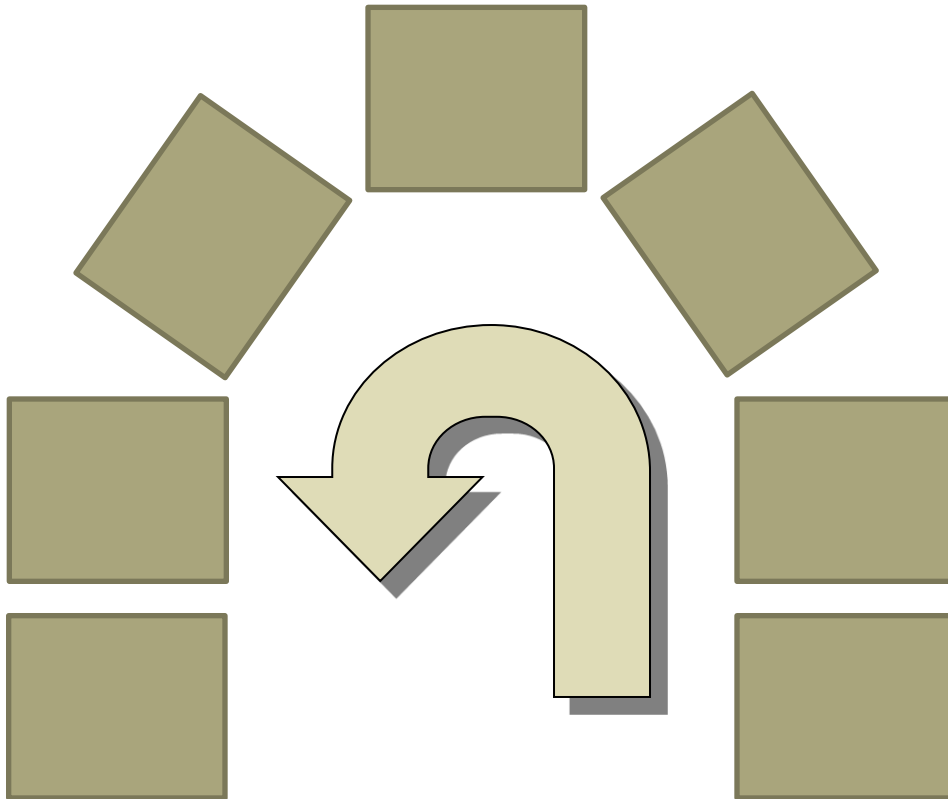
- e.g. toes out to toes in time for OR rooms. Great tool for room turnaround.



Spaghetti Diagram



Cellular Flow

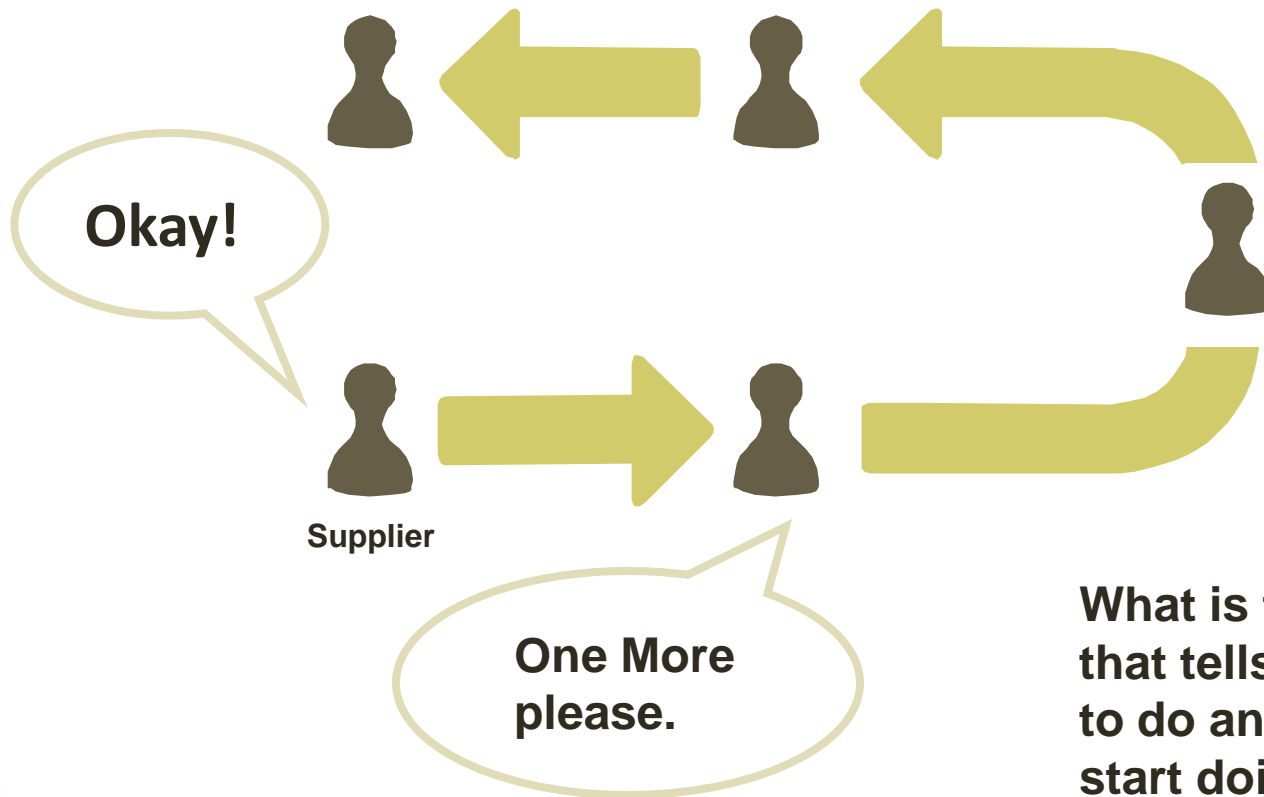


Characteristics

- Point of use storage
- Simplified handling and shorter distances between points
- Visual goals and metrics

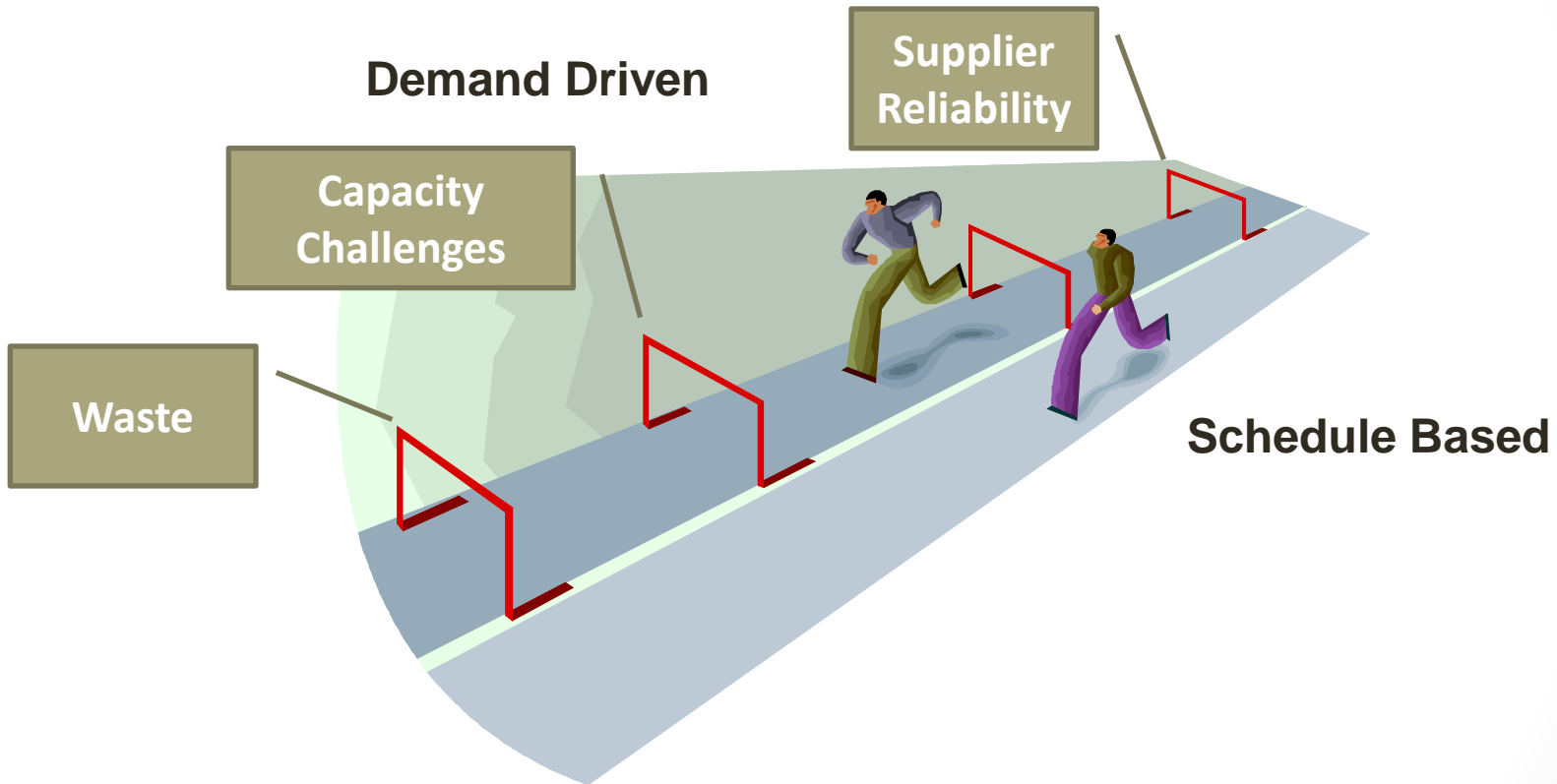
Establish Pull

The Customer orders one unit, then only one unit is made and delivered.



What is the signal that tells you what to do and when to start doing it?

Just In Time (Pull)

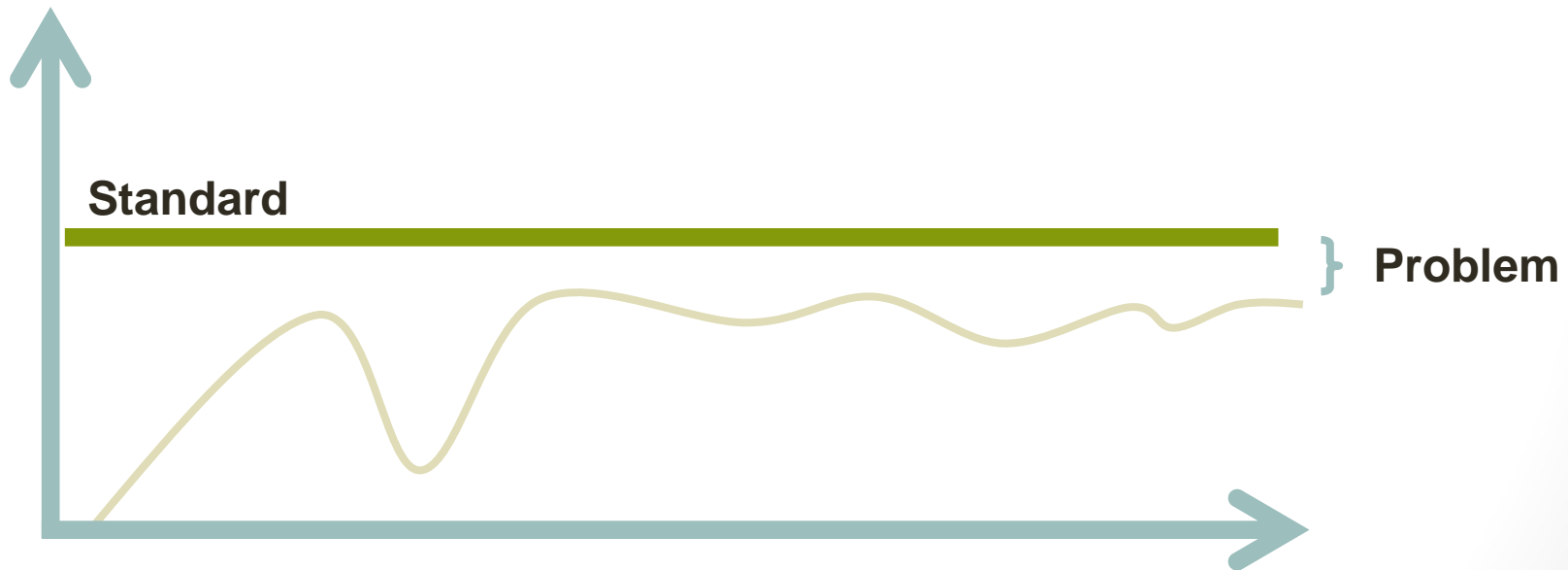


Seek Perfection



Set a Standard

Always measure against a standard



Summary of Lean Thinking

- Do our work every day in a standard way...that we created
 - Not just the way the work evolved!
 - Be alert to things going wrong
 - They always do!
 - Fix the problem now
 - For this patient or co-worker
 - Find and fix the root causes of the problem
 - So it never happens again!
- Spear, Billi*
- Solving Problems
 1. Go and See
 2. Ask Why 5 times
 3. Respect people
- Mr. Cho*

Respect People

“to lead the organization as if I had no power” and that he must shape the organization by example through coaching, understanding and helping others to achieve their goals.

Kan Higashi

Sharing his greatest challenge with
Chairman Gary Convis of the Toyota Motor Manufacturing Kentucky

“It is a mistake to suppose that men succeed through success; they much oftener succeed through failures. Precept, study, advice and example could never have taught them so well as failure has done.”

Samuel Smiles

British author of “Self Help”
(favorite of Sakiichi Toyoda in late 1800s)








Lean Thinking is just...

- ... Simple and practical, consistently solving real problems in real time, at the source, at all levels.
- ... Not jumping to conclusions.
- ... Fixing the problem now.
- ... Hard on the problem, easy on the people.
- ... Leader saying, “Follow me. Let’s look together.”
- ... Leading by being knowledgeable, fact driven, expert negotiator, strong willed (for organization’s goals) yet flexible; leading by influence and persuasion.
- ... Not telling people exactly what to do.
- ... Having individual responsibility clear.

John Shook

Lean Thinking as a Scientific Method Applied to Daily Work

Scientific Method

- Observation 
- Hypothesis 
- Intervention 
- Results/reflection 
- Revise hypothesis 
- New intervention 
- Structured abstract 

Lean Thinking

- Go see, ask why, respect
- Plan (P)
- Do (D)
- Check/reflect (C)
- Adjust (A)
- Repeat PDCA cycle
- A3 report, Value Stream Map

Lean is not applying lean tools or
systems to each process

But ...

Developing a kaizen (improvement) mindset
in every employee

Why We Chose Lean

- To improve safety, quality and efficiency; to reduce stress and errors
- It is a learning approach
 - Empowers workers to redesign their work
 - Uses “Work as Learning”
- It is the scientific method applied to all we do
 - Uses “Work as Discovery” of new knowledge
- It focuses on our customer...the patient

Thank You

Resources

Books

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Internet Sites

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- Lean Enterprise Institute: <http://www.lean.org/>
- Ideal Patient Care Experience at UMHS
- Crossing the Quality Chasm (IOM): <http://www.nap.edu/openbook.php?isbn=0309072808>
- Lean Enterprise Academy (UK): <http://www.leanuk.org/>
- National Health Service (UK): <http://www.networks.nhs.uk/networks.php?pid=211>
- Wikipedia: http://en.wikipedia.org/wiki/Lean_manufacturing