Sustainability in Healthcare

A workshop on sustainability strategies for hospitals

JUNE 13, 2013

Presented by:

New York State Pollution Prevention Institute

RIT RGHS & Alliance

Funding provided by the New York State Pollution Prevention Institute through a grant from the NYS Department of Environmental Conservation
Any opinions.

Introduction to Lean Healthcare

Presented by:
Steve Lockwood,
CITEC Business Advisor / Lean

June 2013

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What is Lean…

Lean Enterprise **is a systematic approach to identifying and eliminating waste (non-value-added activities) through continuous improvement by flowing the **product at the pull of the customer in pursuit of perfection.**

****Product = Process, Information, Service, Patients**

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Definition of Value Added

- **Value Added**

  Any activity that increases the form or function of the service. These are the things for which our patients would be willing to pay.

- **Non-Value Added**

  Any activity that does not add form or function or is not necessary. These activities should be eliminated, simplified, reduced, or combined.

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Lean is not…

a job reduction strategy

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Lean in Healthcare

The tools of Lean will allow you to:

provide better service

with less waste

with improved quality

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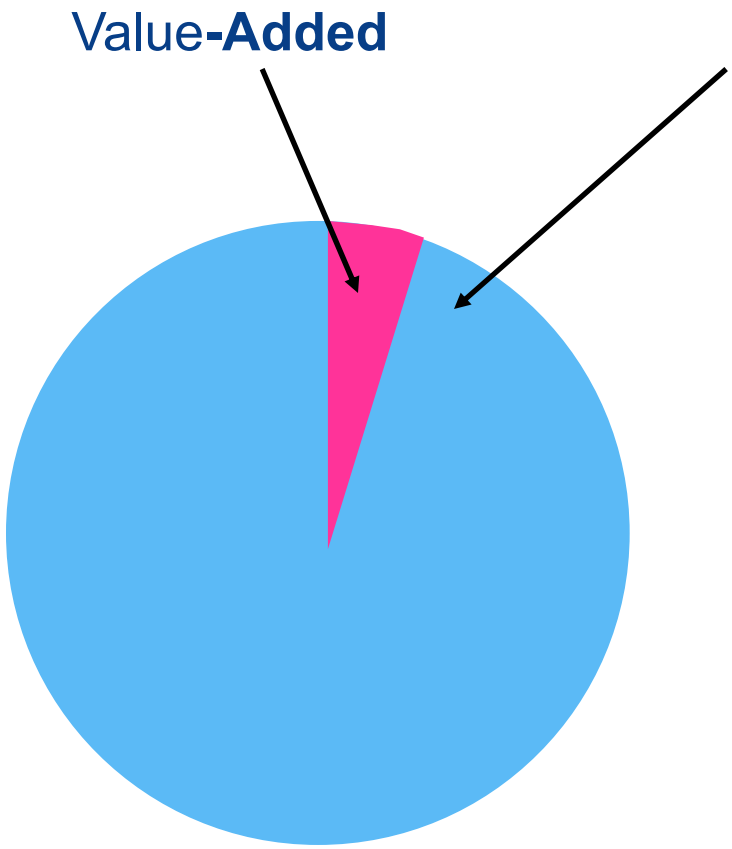
Lean = Eliminating (8) Wastes



Non-Value-Added

- **D**efects
- **O**verproduction
- **W**aiting
- **N**ot Utilizing Employees
- **T**ransportation
- **I**nventory
- **M**otion
- **E**xcess Processing

Typically 95% of all lead time is non-value-added.

Anything that adds cost or time without adding value as defined by the primary customer is WASTE.

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Defects

- Medication error
- Wrong procedure
- Wrong patient
- Missing information
- Paperwork doesn't match
- Information entered incorrectly
- Incompatible software
- Lack of standard work

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Overproduction

- **Making more than is required by the next process**
- **Making it earlier than is required by the next process**
- **Making it faster than is required by the next process**

  - Pills given out early
  - Multiple bosses & multiple jobs cause wrong order of jobs
  - Duplication of tests

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Waiting

- For bed assignments
- Discharge,
- Testing results
- Approvals
- Equipment
- Couriers
- People…

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Not Utilizing Employee's Knowledge, Skills, and Abilities

The waste of not using people's abilities (mental, creative, physical, skill)

- Causes of People Waste
  - Incompatible hiring practices
  - Politics
  - Corporate culture
  - Improperly trained employee
  - Old guard thinking
  - Business culture
- Examples
  - Bypassing procedures to hire a favorite candidate
  - Start using system software without prior training
  - Qualifications unclear
  - Not providing opportunity for growth
  - Temporary workforce
  - Flawed suggestion system

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Transportation

- Moving same patient, specimens, or supplies,
- Defects/rework
- Poor layout
- Poor scheduling

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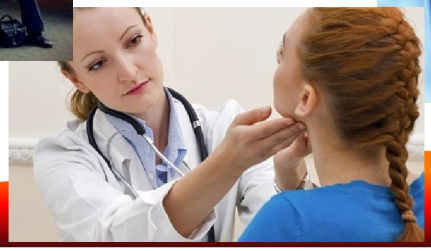
Excess Inventory

Any supply in excess of a one-piece flow through your process

- Pharmacy stock
- Supplies (discount)
- Specimens waiting for analysis
- Files, manuals
- Patients…



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Motion

Any movement of people or machines that does not add value to the product or service

- Searching for patients, needed meds right charts, supplies
- Common items stored on top or bottom shelves.

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Excess Processing

Effort that adds no value to the product or service from the customers' viewpoint

- Retesting
- More paperwork. Printing, mailing, faxing emailing same document
- Duplicate procedures, forms
- Use of different software in different departments

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Waste becomes accepted

That's just the way work is done around here

It's the system

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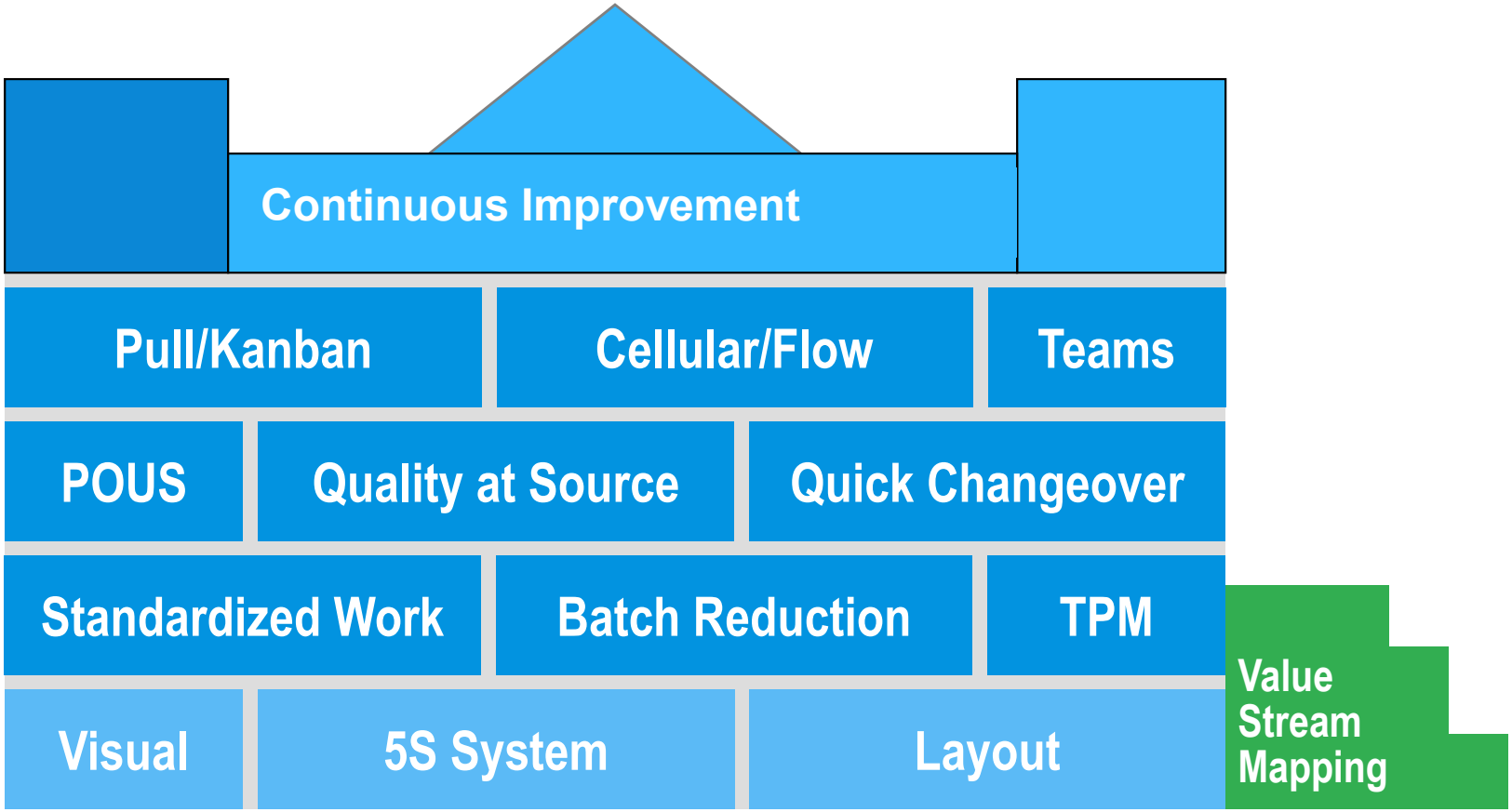
Lean Building Blocks



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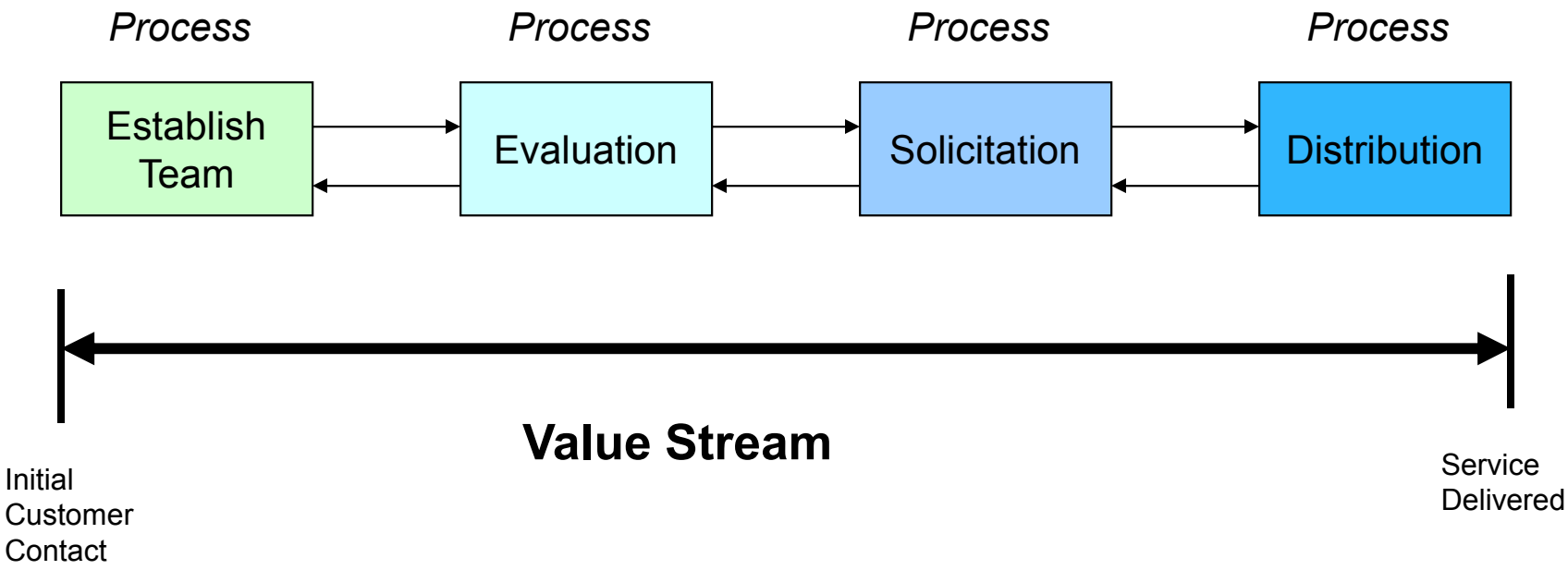
VSM Improvement vs. Process Improvement

Value Stream = All steps, both value added and non value added, Required to complete service/widget from beginning to end



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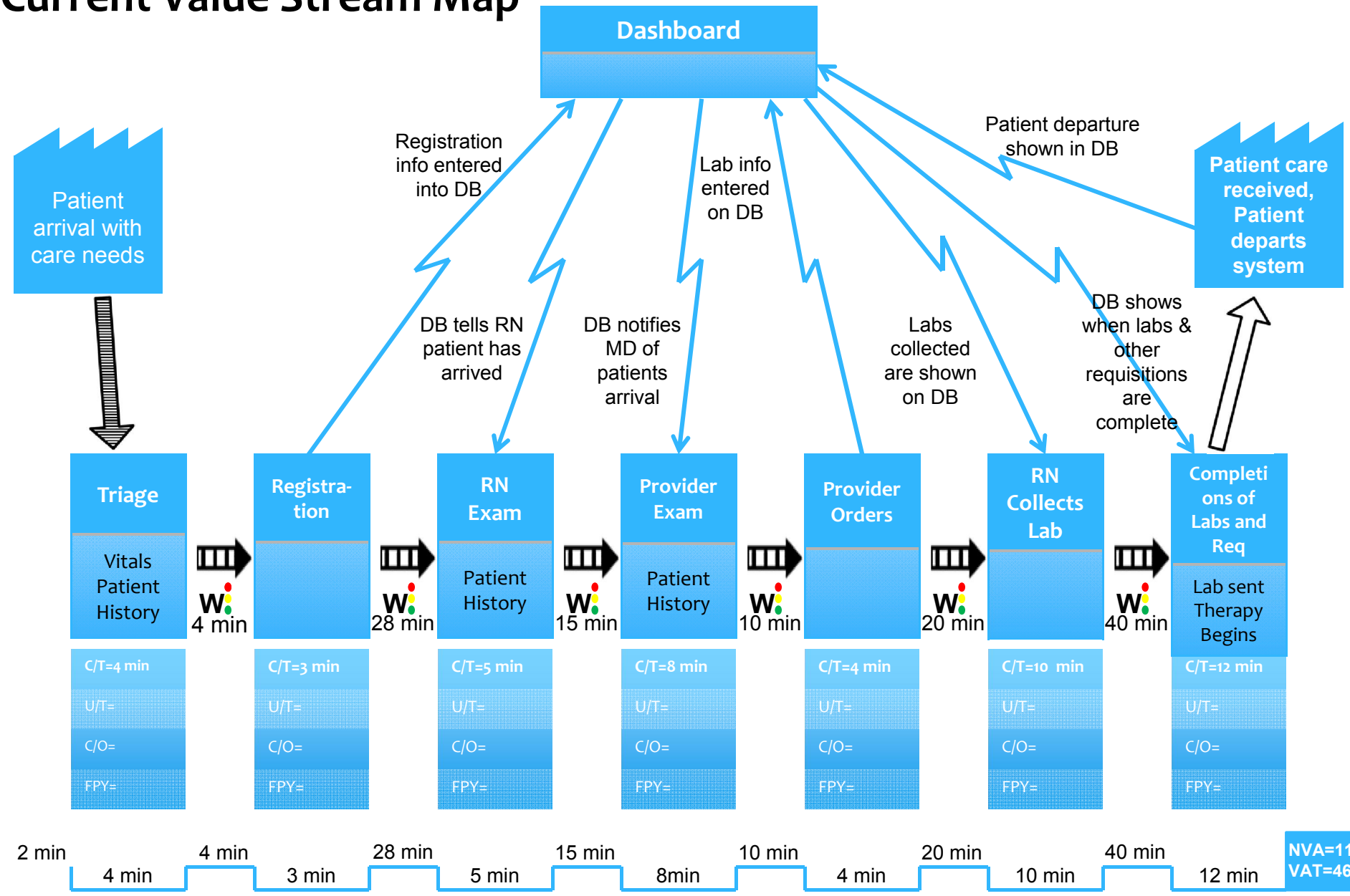
Current Value Stream Map



Lead Time = 165 minutes

Facility Layout:

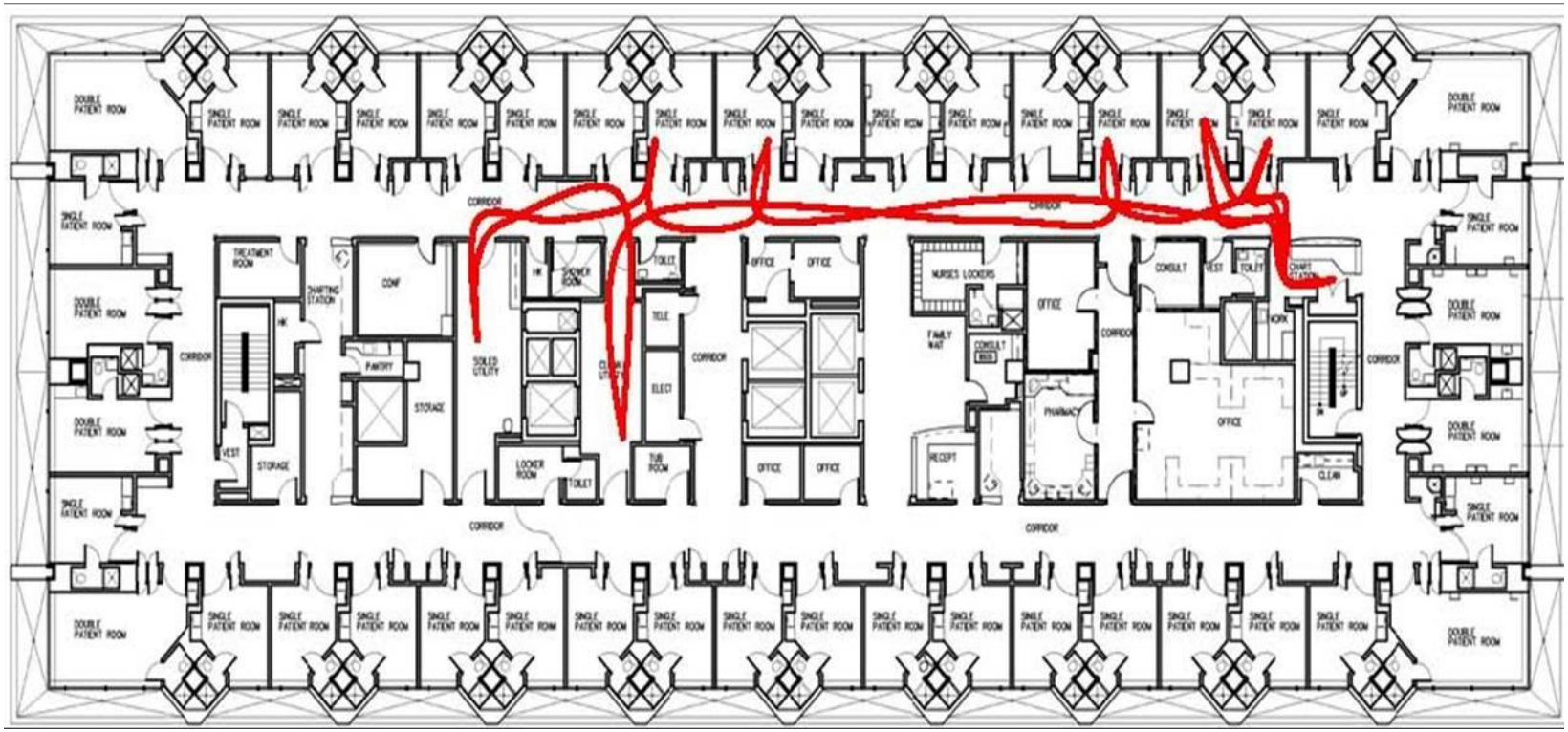


Figure 1. Traditional racetrack configurations distance staff from their patients and one another and increase time spent on non-patient activities.

Facility Layout:

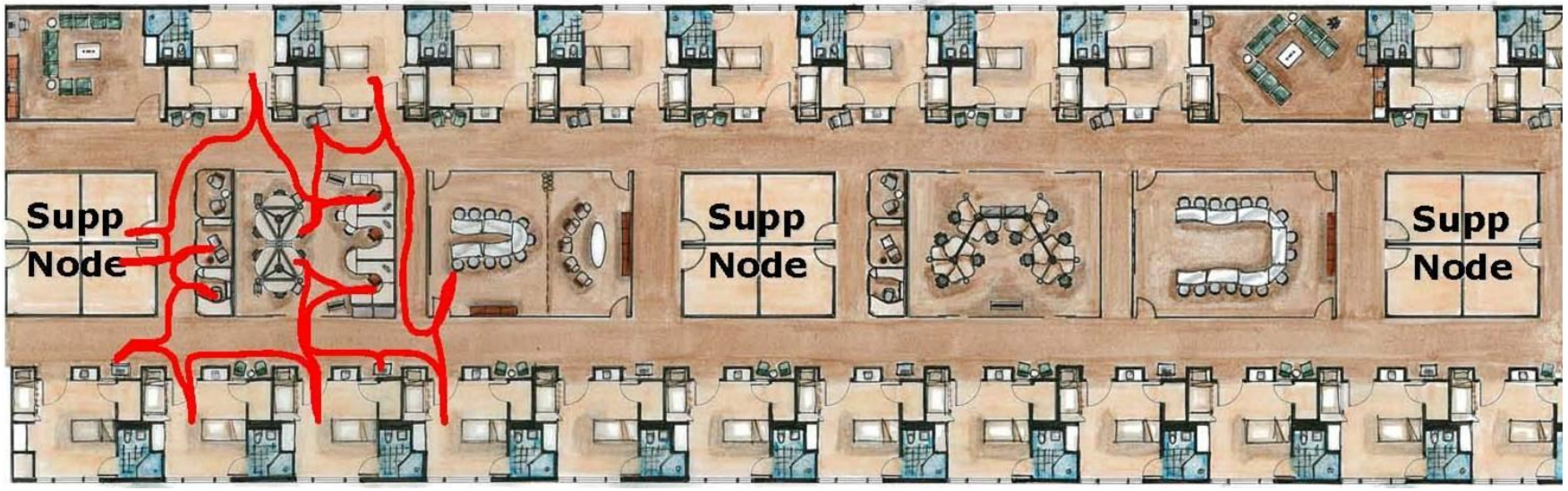


Figure 2. Adaptable spaces create efficient workplaces that can change as processes and requirements change.

5S Workplace Organization

A safe, clean, neat, arrangement of the workplace provides a specific location for everything, and eliminates anything not required.

- **Sort**
- **Set in Order**
- **Shine**
- **Standardize**
- **Sustain**

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5S Workplace Organization

Store room before:

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Visual Controls

Simple signals that provide an immediate understanding of a situation or condition. They are efficient, self-regulating, and worker-managed.

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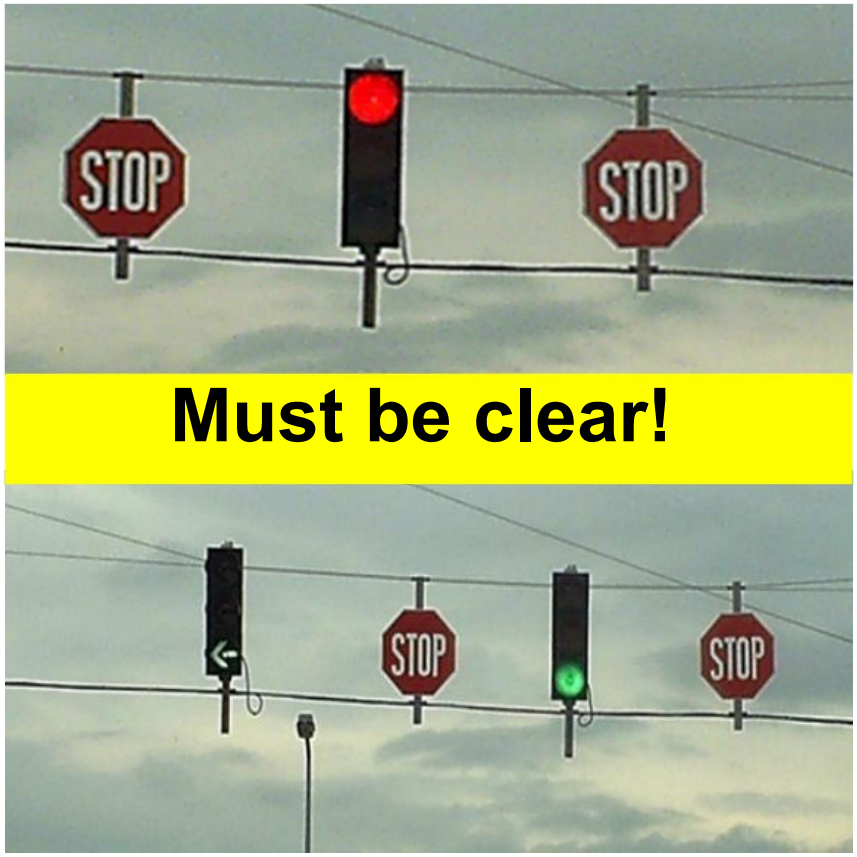
Visual Controls



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Standard Work

DEFINITION:

The process / method to be used ***every time*** by ***everyone*** to do a task ***safely*** based on the best known work practices.

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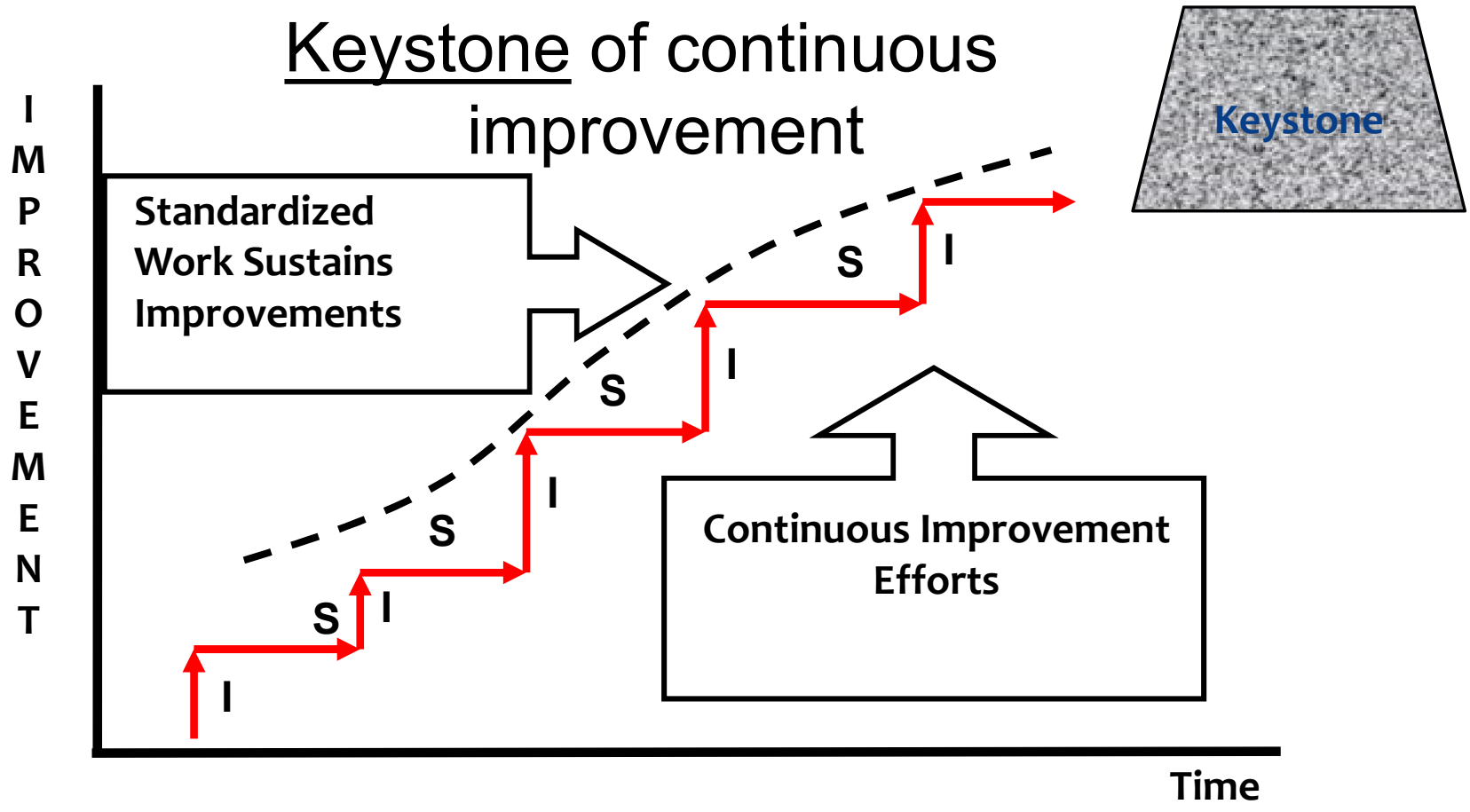
Benefits of Standard Work



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Point of Use Storage (POUS)

- **Material is stored at workstation where used.**
- **Vendor Managed Inventory (VMI) is best!**

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Lean Workforce Practices (Teams):

- **Patient Care Teams – with rotation of highly specified jobs.**
- **Cross-trained and multi-skilled employees.**
- **Continuous improvement mindset.**
- **Process quality, not inspection.**
- **Participatory decision-making.**
- **Leadership at all levels.**

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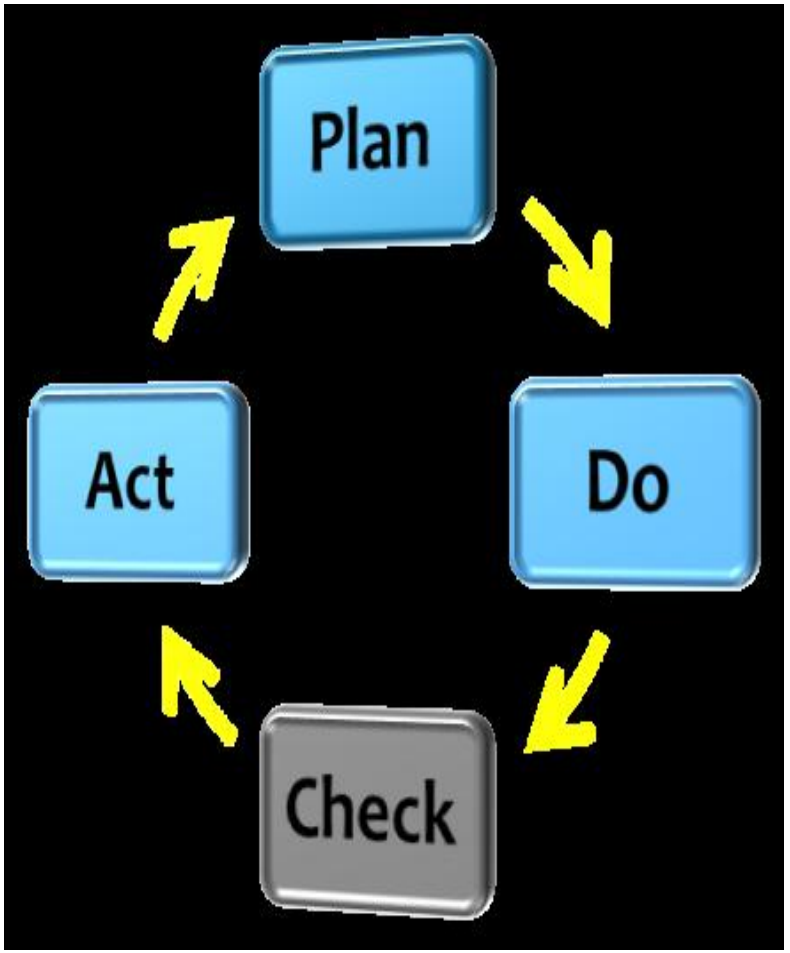
Quick Changeover

Definition: The time between the last good output from the current task and the first good output from the next task at speed.

- Do changeovers occur in the office?
  - One set of documents are put away and replaced by another set
  - Office equipment has to be reset for the next job
  - Computer files are closed down and others retrieved
  - Associates go to the Boss for their next assignment
  - Visits to the supply cabinet for needs
  - Reconciliation of regulatory paperwork

A3 Problem Solving Reports

- 11” x 17” sheet of paper used to show the status of a problem or project.
- Use pictures and graphs versus text
- Follows the PDCA model.



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Kaizen

Rapid Change for the Better

OR

Rapid Continuous Improvement

“Kai” = Take Apart “Zen” = Make Better

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Questions???

Thank you
Steven Lockwood
lockwood@citec.org
(315) 268-3778 x28

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UHS

Making Healthcare Better.
Right Now.



Lean & Green Healthcare

- Lean Six Sigma @ Work

Srikanth (Sri) Poranki, Ph.D., CSS-Black-Belt
Director, Performance Improvement Dept.
Quality & Patient Safety
UHSH

Agenda

- Need for Lean in Healthcare
- Lean at UHS
- Lean & Green
- Questions

U.S. Healthcare Challenges

American health care "gets it right"

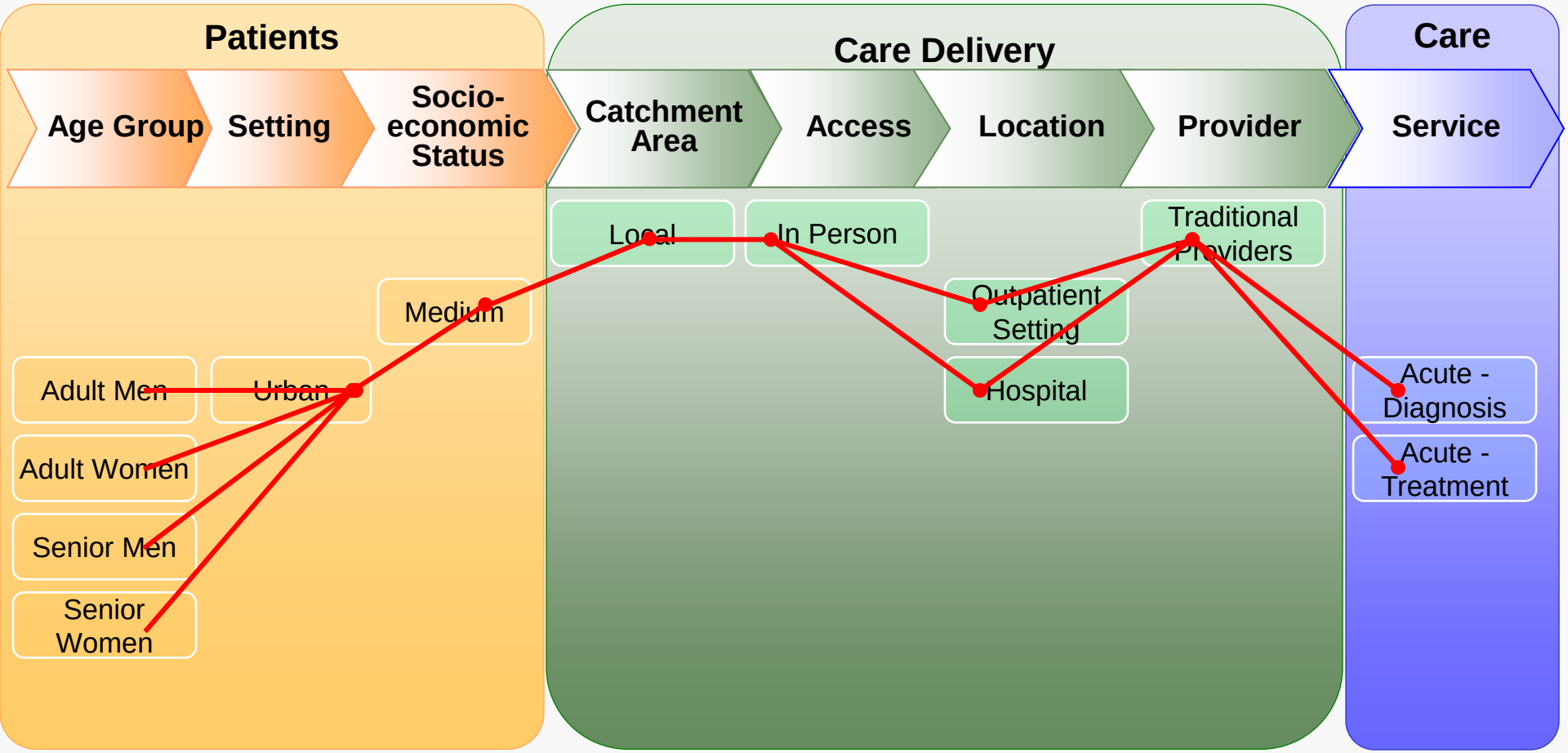
54.9%

of the time.

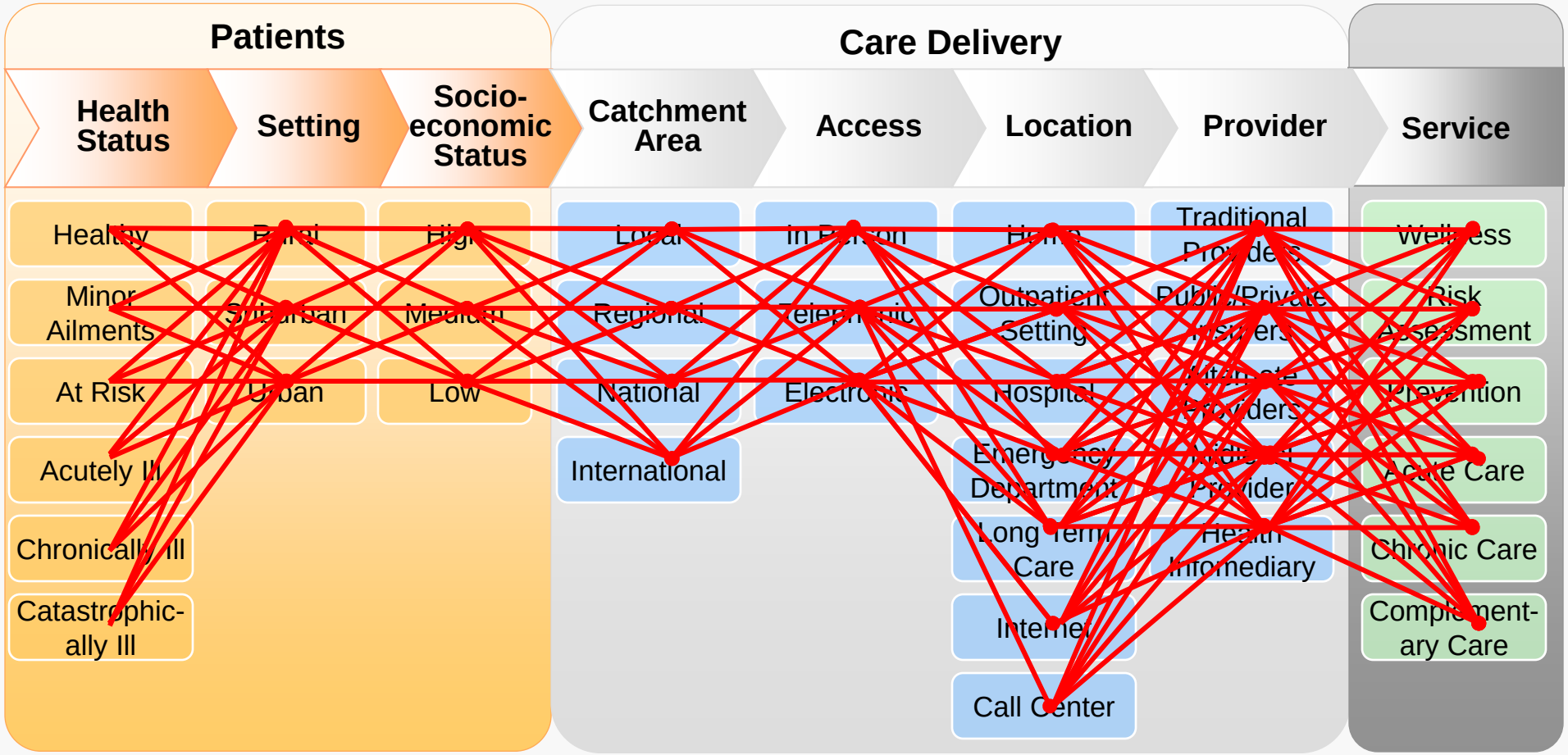
2X Resources ½ Quality

McGlynn EA, Asch SM, Adams J, *et al*. The quality of health care delivered to adults in the United States. *N Engl J Med* 2003; 348(26):2635-45 (June 26).

Healthcare Pathway – in prior to 80's

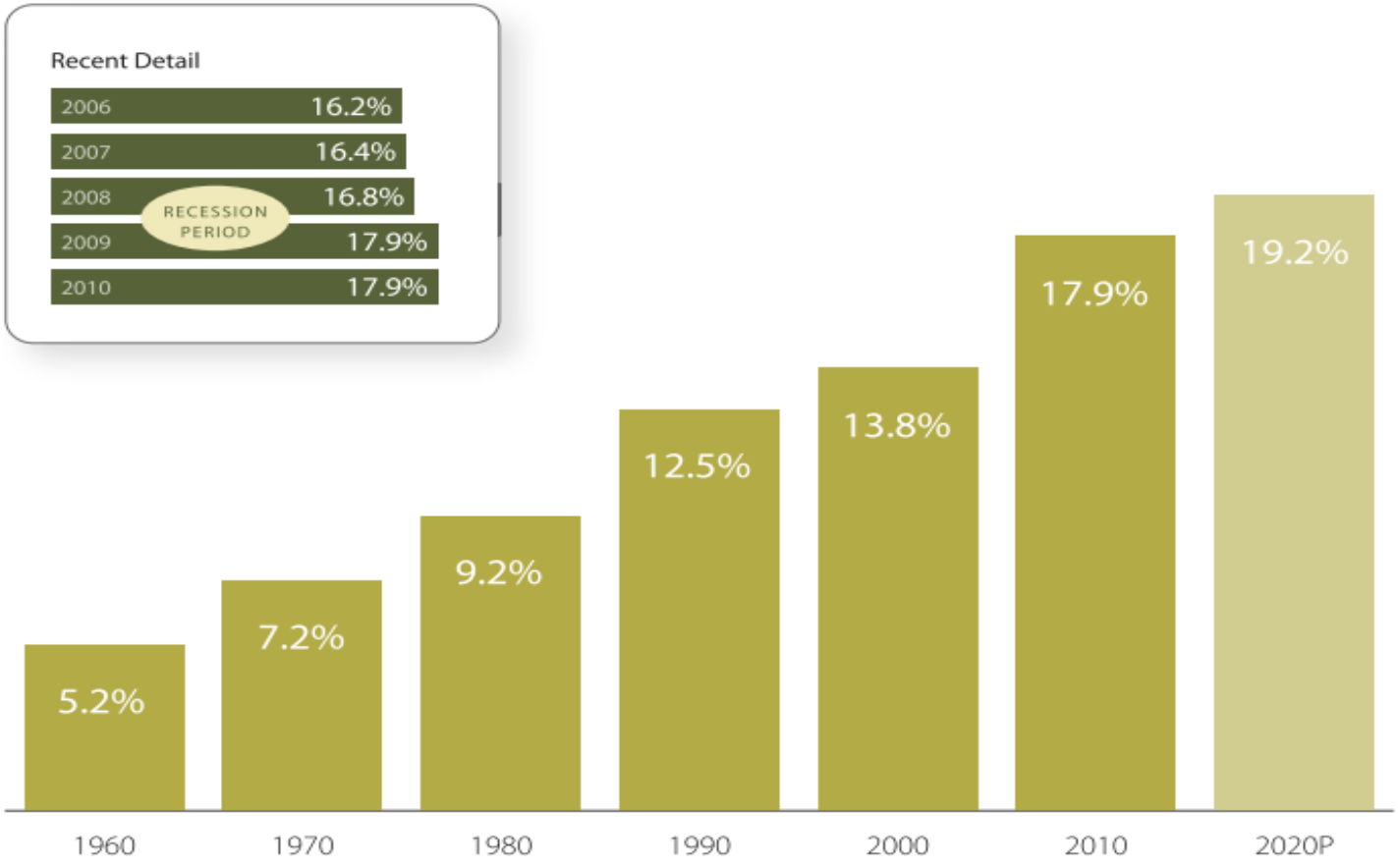


Healthcare Pathway - Current



Health Spending as a Share of GDP

United States, 1960 to 2020, selected years

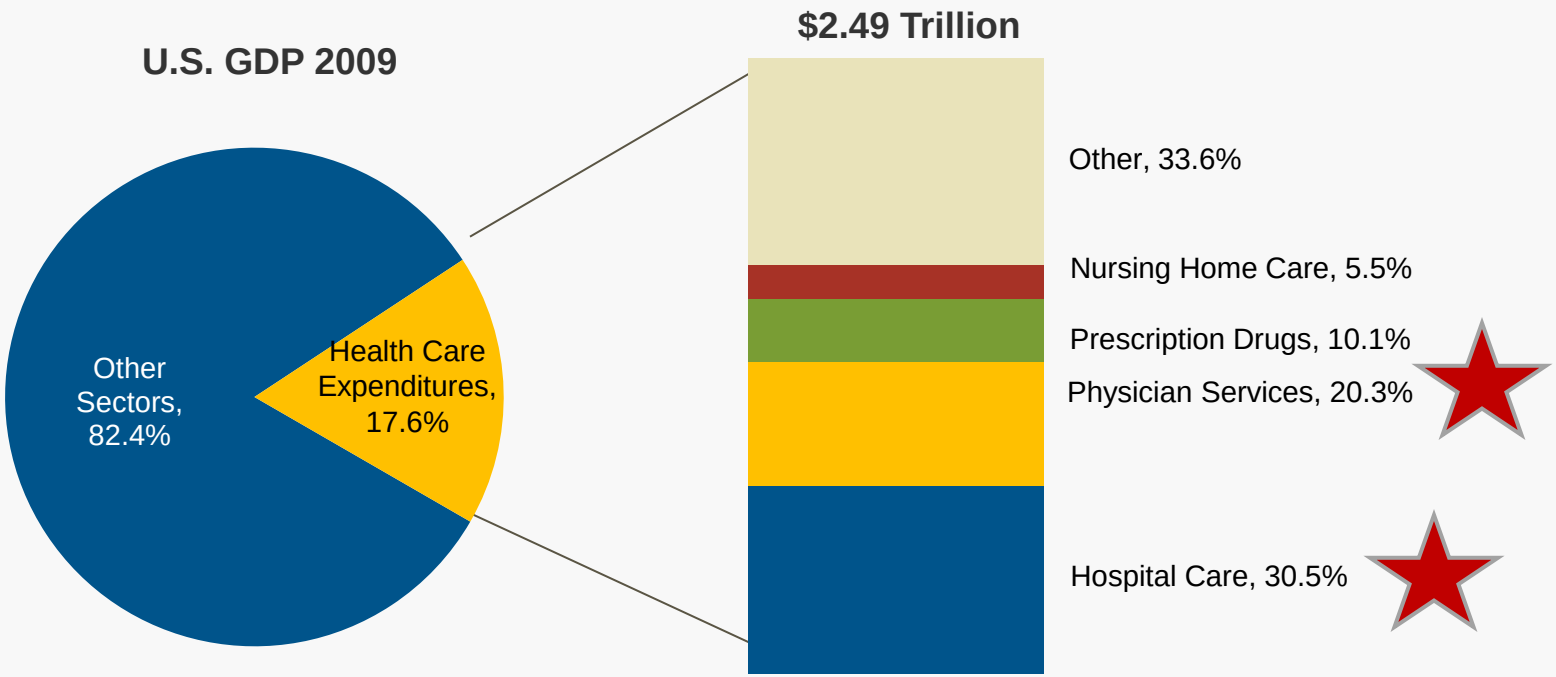


Notes: Health spending refers to National Health Expenditures. Projections (P) include the impact of the Affordable Care Act. 2010 figure reflects a 4.2% increase in GDP and a 3.9% increase in national health spending. CMS projects national health spending will also have accounted for 17.9% of GDP in 2011 and 2012.

Source: Centers for Medicare and Medicaid Services (CMS), Office of the Actuary, National Health Expenditure Data, 2012 release.

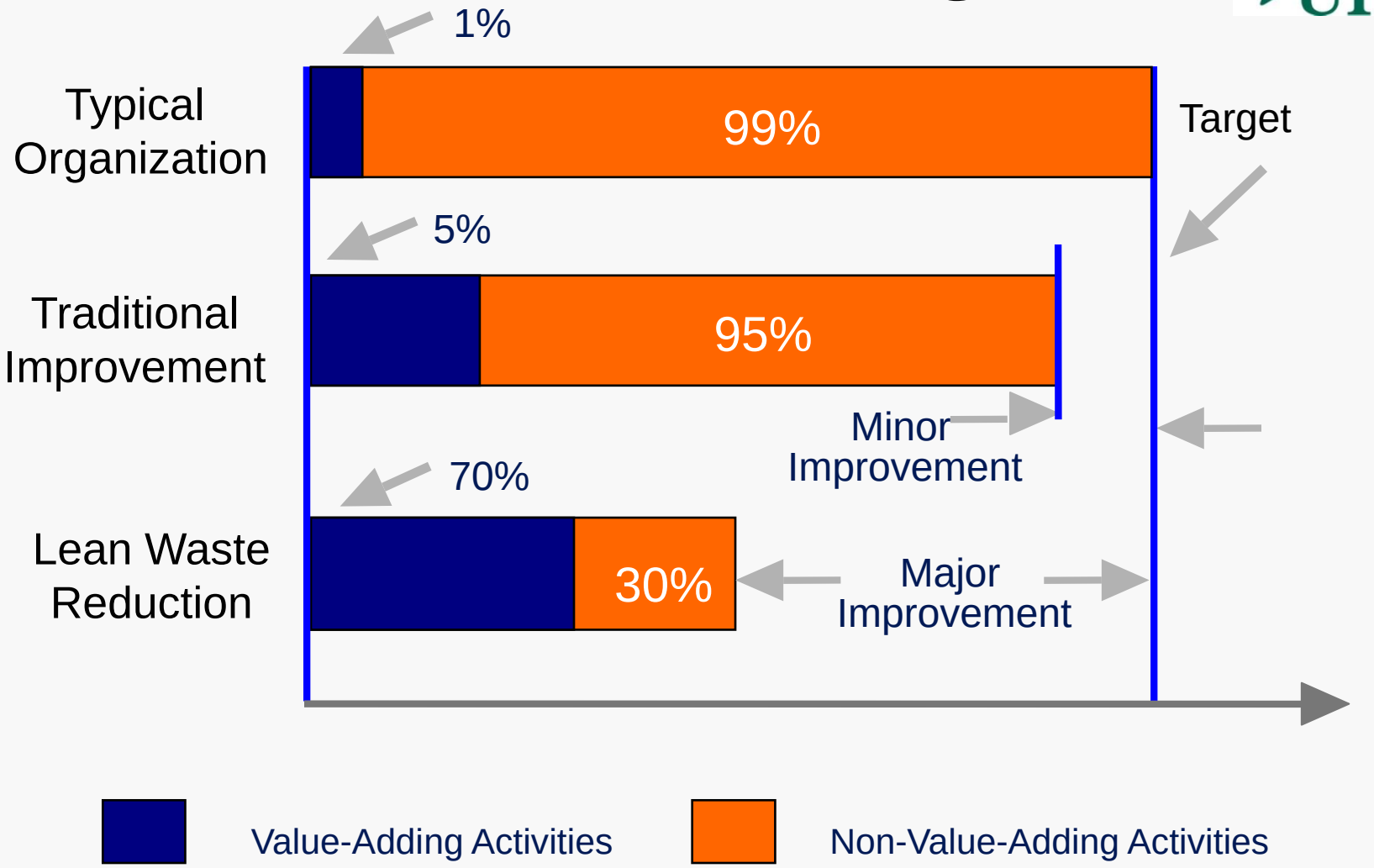
U.S. Health Challenges: Cost

National Health Expenditures as a Percentage of Gross Domestic Product and Breakdown of National Health Expenditures, 2009



Source: Centers for Medicare & Medicaid Services, Office of the Actuary. Data released January 6, 2011.

Introduction to Lean Six Sigma



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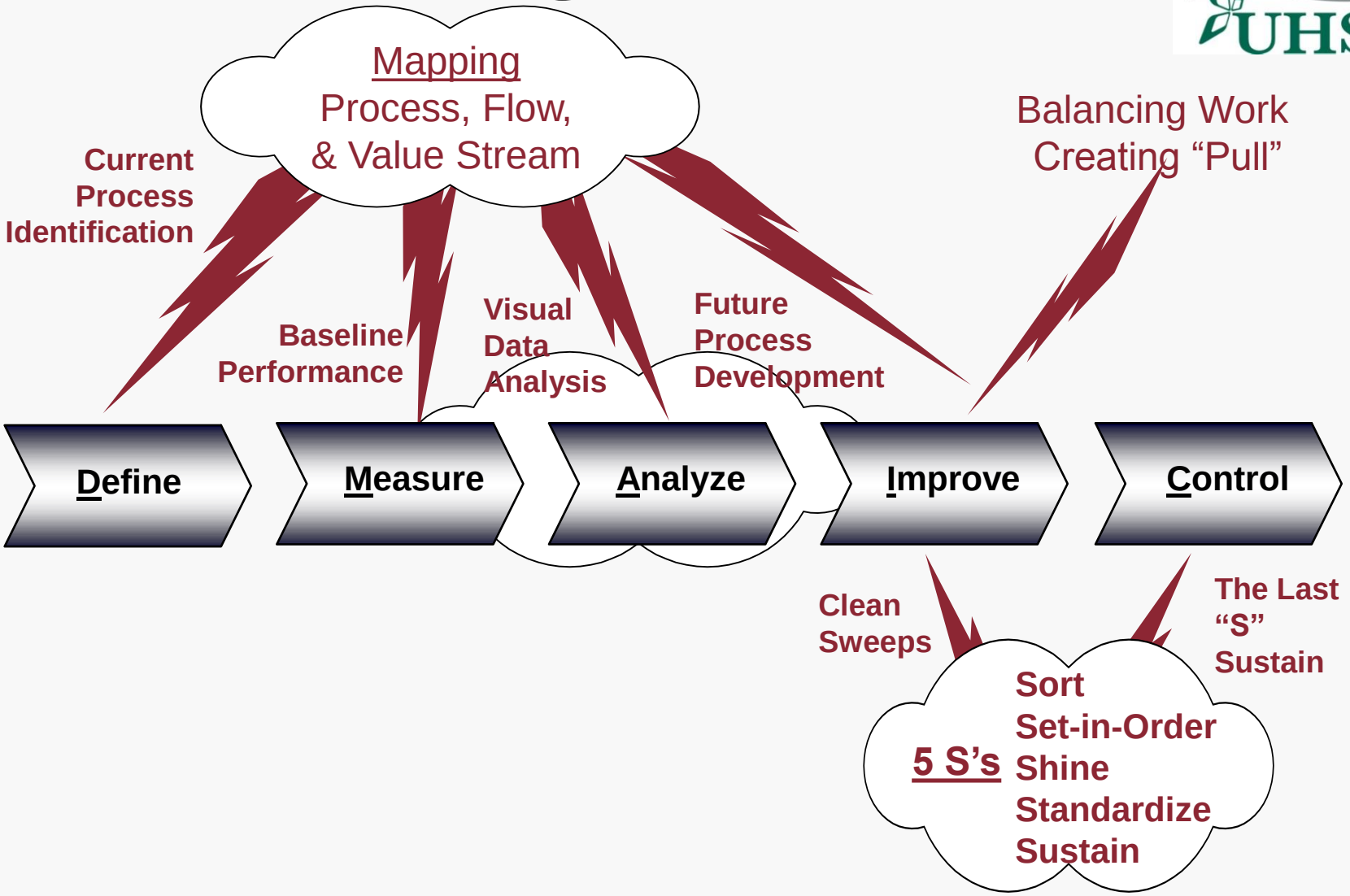
Six Sigma



Six Sigma…Eliminate Variability /Defect s Lean…Eliminate Waste

5 Steps To Lean Thinking

1 Specify Value

Define value in from the customers perspective and express value in terms of a specific product

2 Map the Value Stream

Map all of the steps…value added & non-value added…that bring a product of service to the customer

3 Establish Flow

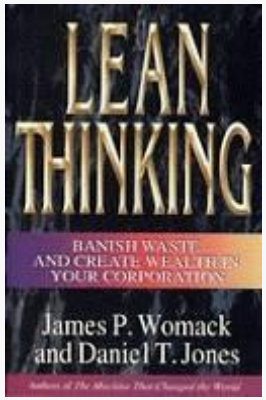
The continuous movement of products, services and information from end to end through the process

4 Implement Pull

Nothing is done by the upstream process until the downstream customer signals the need

5 Work to Perfection

The complete elimination of waste so all activities create value for the customer



Key concepts - identifying value, the value stream and waste

Waste in Healthcare

Wastes	Examples
1. Defects	1. Re-sticks, redraws, med errors, wrong site surgery
2. Overproduction	2. Blood draws done early to accommodate lab
3. Inventories	3. Pts waiting for bed assignments, lab samples batched, dictation waiting for transcription
4. Movement	4. Looking for pts, missing meds, missing charts or equipment
5. Excessive Processing	5. Multiple bed moves, retesting
6. Transportation	6. Excessive transporting pts for tests
7. Waiting	7. Inpts waiting in ED, Pts waiting for discharge, MDs waiting for test results

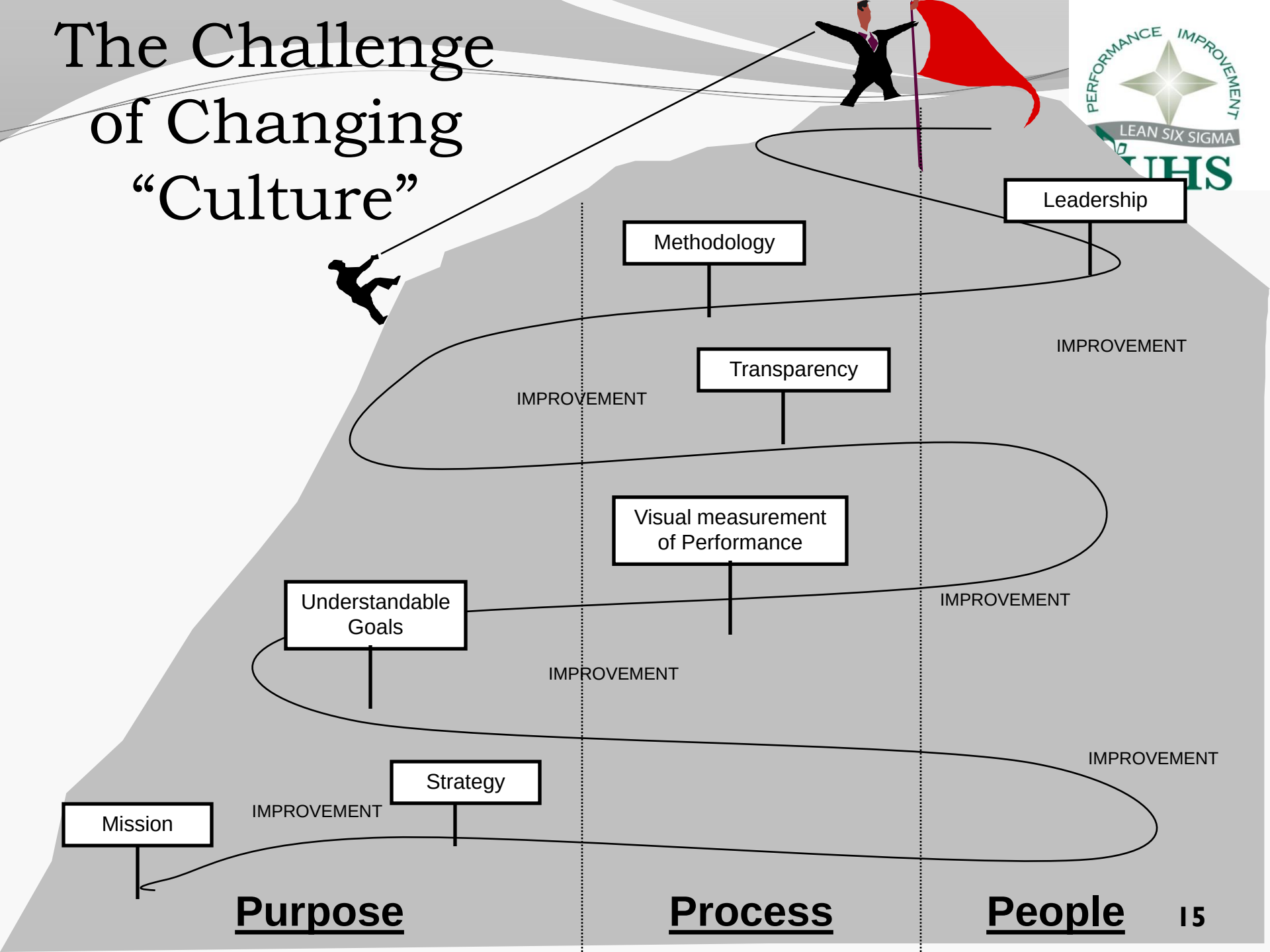
Major Lean Tools/Concepts

1. **Charter**
2. **Value Stream Mapping (VSM)**
3. **Data Driven Decision Making**
4. **Spaghetti Mapping**
5. **5S & Visual Controls**
6. **Kanban**
7. **Other Concepts**
    a. **Batch vs. Single Piece Flow**
    b. **Push vs. Pull System**
    c. **Balancing, Leveling, Sequencing**
    d. **Set-Up Reduction**
    e. **Standard Work**
    f. **Error Proofing**

UHS

~ 5500 employees
- 30 Primary Care Clinics
- Comprehensive Healthcare Services Provider

The Challenge of Changing "Culture"

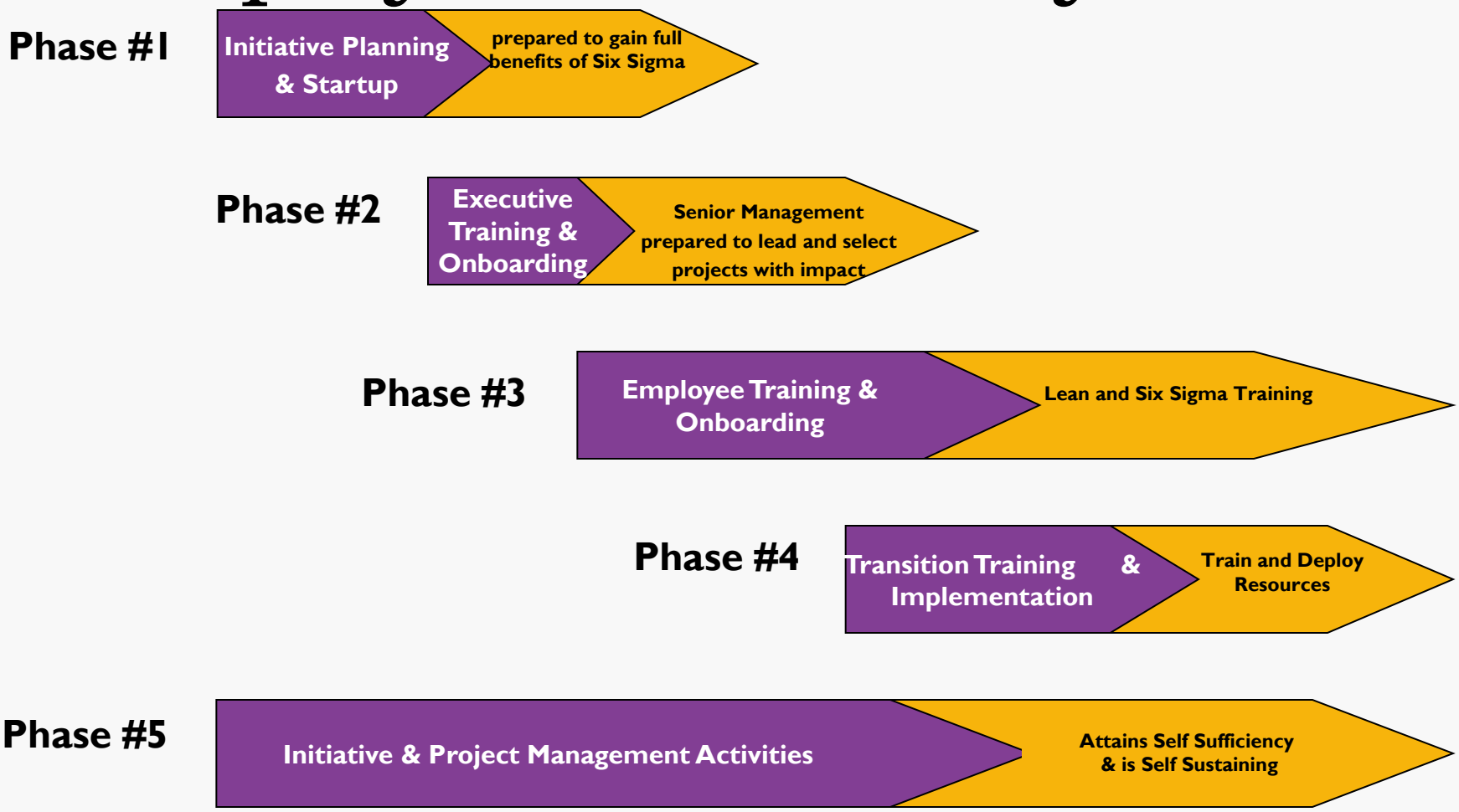


Performance Improvement Dept. @ UHS

- Team
  - Under Quality & Patient Safety

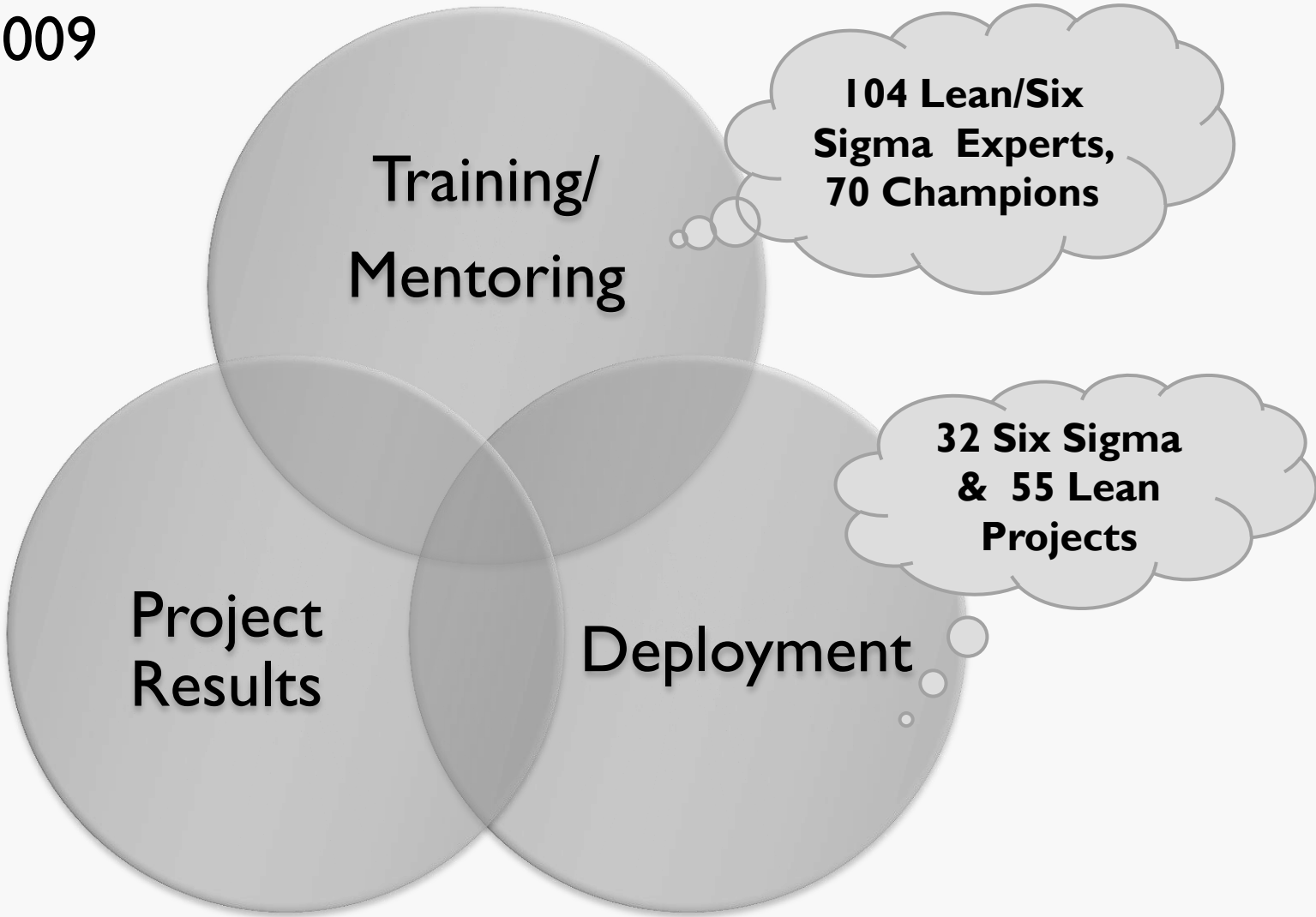
- Roles & Responsibilities
  - UHS Lean Six Sigma Program Development & Deployment
  - Employee Training
  - Data Analytics
  - Project Management
  - Have Fun!!!

Deployment Journey



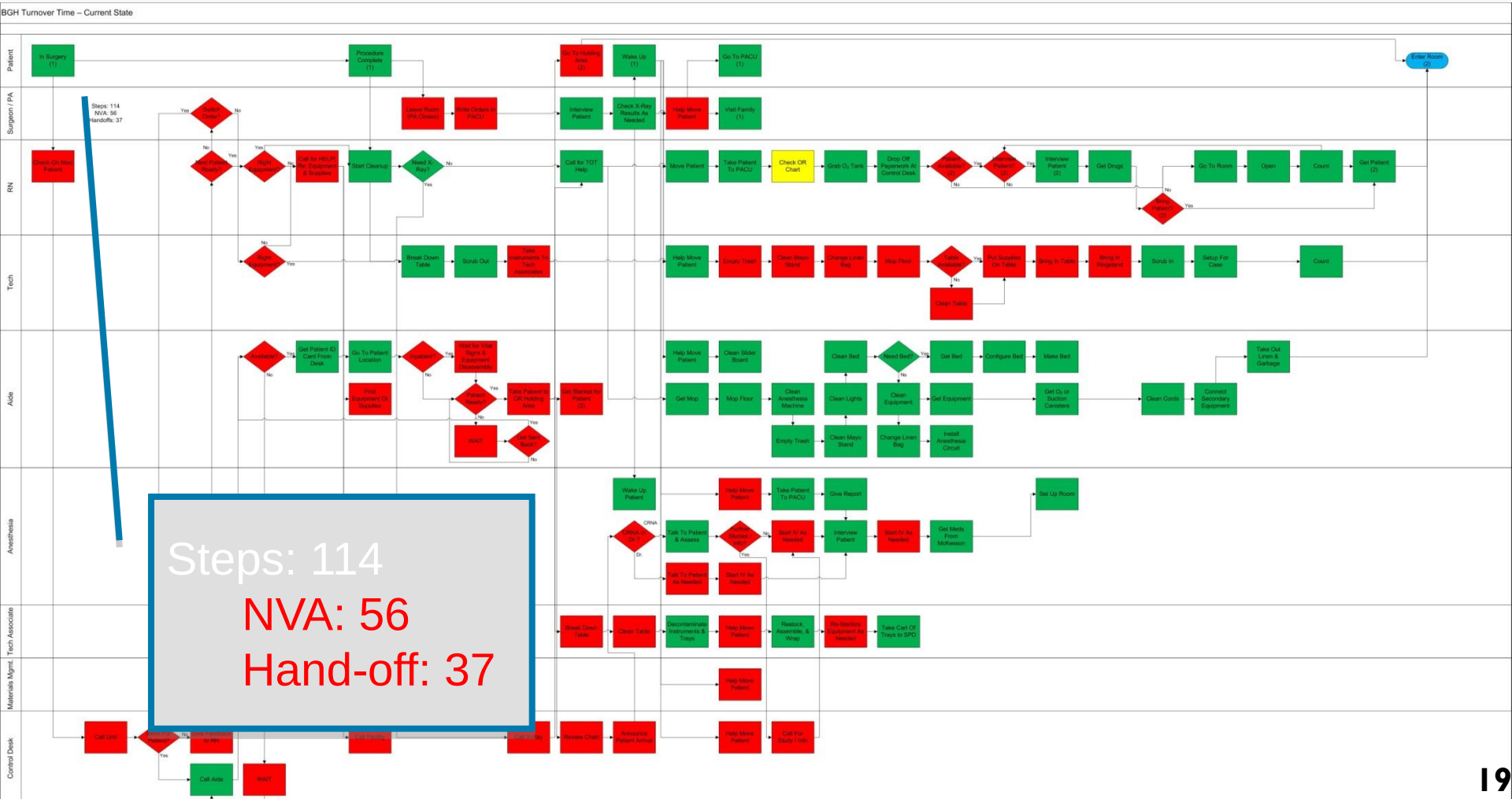
Performance Improvement (PI)

- Since 2009



Reducing OR Change Over Time

CURRENT STATE



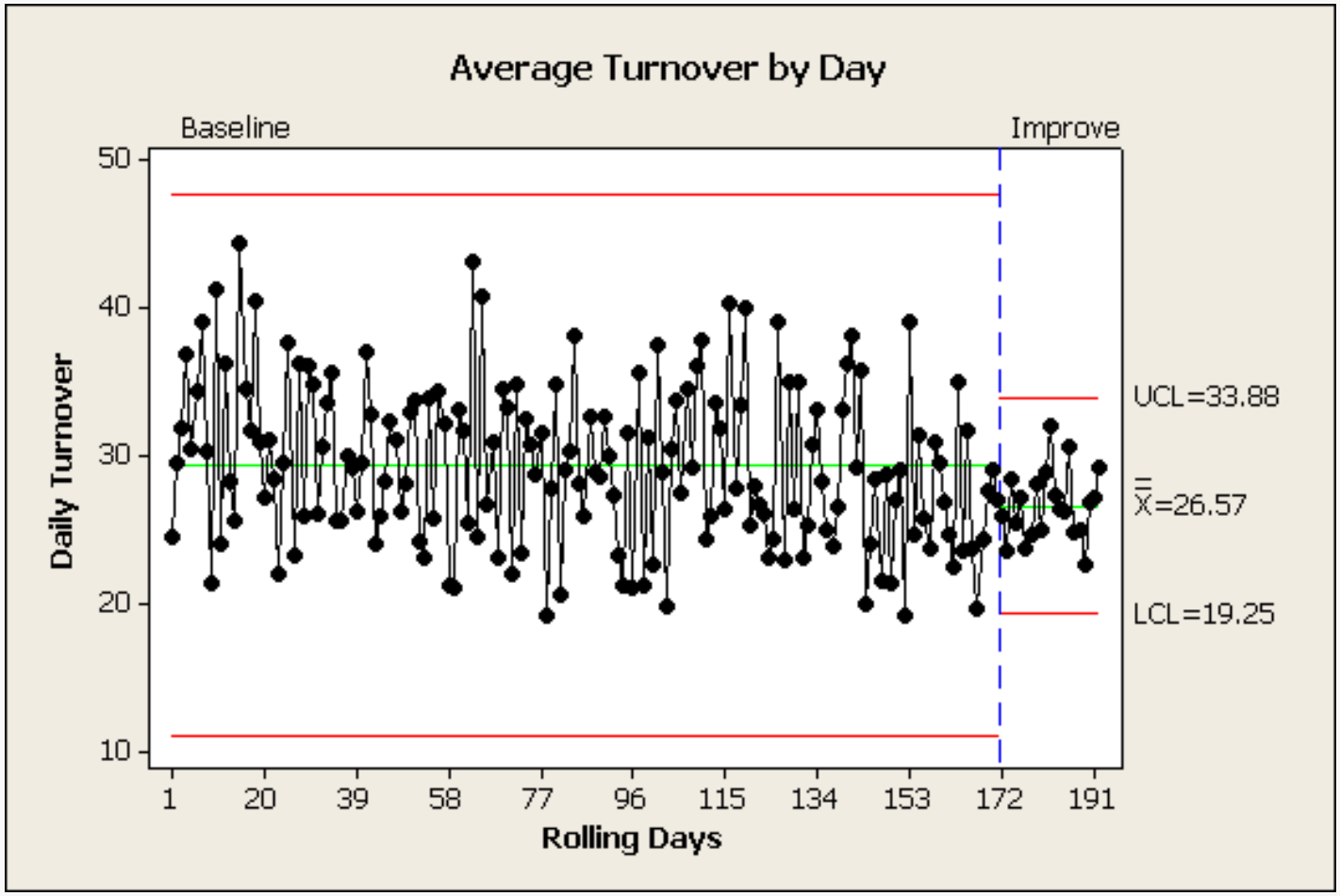
FUTURE STATE

Steps: 76

NVA: 1

Hand-off: 17

Results


Average Turnover by Day
Baseline
Improve
50
40
30
20
10
Daily Turnover
1
20
39
58
77
96
115
134
153
172
191
Rolling Days
UCL=33.88
X=26.57
LCL=19.25

Lean Eliminates "Wastes"
But Not Always Environmental Wastes

Lean's "Deadly Wastes"

1. Defects
2. Overproduction
3. Waiting
4. Non-value added (over-) processing
5. Transportation
6. Inventory
7. Motion

Where are the environmental wastes?

Excess material use

Toxic / hazardous material use

Scrap & non-product output

Hazardous wastes

Pollution (emissions/effluents)

Energy and water consumption

UHSH Initiatives

Recyclable Vs. Reusable

Energy Efficiency

Green Products

UHS

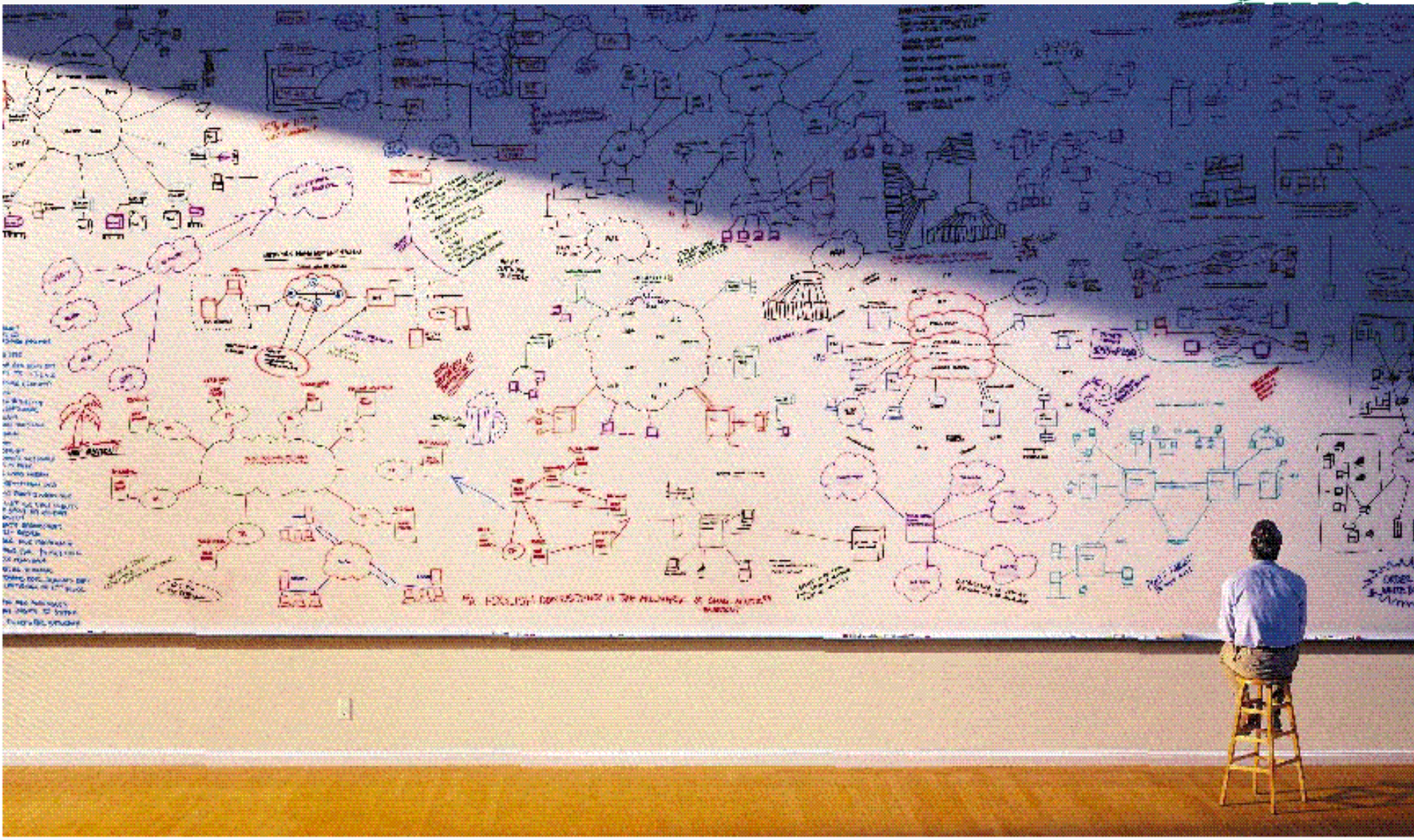
Waste Management

ROI $$ negligible

In Summary

- **Lean Six Sigma works effectively in Healthcare**
- **Lean tools applicapable to Green**
- **Lack of motivation for Early Adopters**
- Future areas
  - **Strong Regulatory/Govt. Support**
  - **Technology has to be in place**
  - **Incentives have to align**

Questions?



NYSERDA
Assistance and Incentives for Healthcare Projects

Energy-Efficiency in Healthcare
June 13, 2013

Lina Kohandoust – Luthin Associates

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nyserda
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What is NYSERDA?

New **Y**ork **S**tate **E**nergy **R**esearch and **D**evelopment **A**uthority

Established by the New York State Legislature in 1975

NYSERDA is tasked to address the State's energy & environmental challenges

Mission

Advance innovative energy solutions in ways that improve New York's economy and environment.

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What we do

- Energy Efficiency
- Renewable Energy
- Research & Development
- Energy Analysis
- Green Jobs
- Legislation/Policy
- Transportation

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Energy Efficiency Services Programs

New Buildings
New Construction Program

Existing Buildings
Existing Facilities
FlexTech Program

HVAC Business Partners Program

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NYSERDA Is Your Energy-Saving Expert

- Together with hundreds of experts and millions in financial incentives, NYSERDA can help you increase energy efficiency, improve productivity and save money.

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Funding Eligibility

- **System Benefits Charge (SBC):** consumption-based charge on customers **electric and/or gas** utility bills.

- Central Hudson Gas & Electric
- Con Edison
- New York State Electric & Gas
- National Grid
- Orange and Rockland
- Rochester Gas and Electric

New Construction Program

Objective:
To effect a permanent transformation in the way new and substantially renovated buildings are designed and constructed.

- Technical Assistance Services
- Green Building Services
- LEED Incentives
- Commissioning Incentives
- Design Team Incentives
- Capital Cost Incentives

New Construction Program

Pathways of Participation

- Pre-Qualified Equipment
  - Menu-based
- Custom Measure
  - System-based
- Whole Building Design
  - Building-based
- Green Building LEED®
  - Building-based + certification

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New York Presbyterian Hospital

- **Energy Savings: $247,406/year**
- **1,068,953 kWh /year**
- **Summer Peak kW: 126 kW**
- **NYSERDA Incentive $590,273**
- **Simple Payback of 2.79 years**
- **LEED® Gold**

Energy and Green Measures

- Enhanced building glazing
- High efficiency DHW boilers
- High efficiency lighting
- High efficiency roof-top units
- Water-source heat pumps
- Demand controlled ventilation
- Heat recovery ventilation
- Premium efficiency motors
- Low flow fixtures

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Existing Building Programs

Project Identification/ Energy Study

Project Implementation

Technical Assistance

- Identify the changes you could make
  - **FlexTech Program**

Implementation Incentives

- Making the changes
  - **Existing Facilities Program**

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FlexTech Program

Objective:

Help customers make well-informed energy decisions.

Cost-shared energy studies and technical evaluations:

- up to **50%** of cost of technical assistance

Focus on cost-effective studies and energy efficiency measures

Incentive Cap

- 10% annual energy spend or
- $1,000,000 per project

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Objective & Credible Analyses

FlexTech cost-shared energy-efficiency analyses include:

- Energy Feasibility Studies
- Master Planning
- Industrial Process Efficiency
- Data Centers
- Retro-commissioning
- Peak-Load Reduction and Load Management

Existing Facilities Program

Pre-Qualified Incentives

Install then apply – $30,000 Max.

$/unit of equipment

$ $ $ $ $ $ $ $ $ $ $ $

Performance-Based Incentives

Apply then install...up to $5M!

$/unit of energy

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Existing Facilities Program

Pre-Qualified Incentives

- Amount determined using measure worksheets

Water Heating Equipment					
Measure Description and Eligibility Criteria	Measure Code	Unit Size	Count	Unit Incentive	Total Incentive
Storage Water Heater Tank Insulation • Water heater must be natural-gas fired • Incentive is paid per square-foot of insulated surface	WH-1	N/A		$1.00/sq. ft.	
New Circulation Controls Applicable for Reducing Standby Losses on Domestic Hot Water • Control must be installed on natural-gas fired heating systems	WH-2	N/A		$500/unit	
	(enter on page 1)		Total Water Heating Equipment Incentive Requested		$

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Existing Facilities Program

Performance-Based Incentives

- **Incentive is paid on the energy savings over one year**

NYSERDA offers millions in financial incentives for a variety of energy improvements. You can use NYSERDA programs to help offset the cost of energy-efficiency projects such as:

- **Existing Facilities (up to $2,000,000) —**Existing Buildings and Demand Response
- **Industrial & Process Efficiency (up to $6,000,000)—**For Industrial and Data Center, Process and Facility Improvements

Existing Facilities Program

Performance-Based Incentives

Minimum project size	$30,000 minimum incentive
Simple payback threshold	No less than 1 year (w/ incentive)
Maximum incentive	50% Project Cost
	$2 million per facility

St. Joseph's Hospital Health Center

Facility:

- 431-bed hospital health center encompassing 16-county service area

Objective:

- Upgrade and consolidate computer equipment

Focus:

- Replace current desktops and servers with virtualized machines
- Upgrade existing network gear

Energy Savings: 862,500 kWh
NYSERDA IPE Incentive: $103,500

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NYSERDA: Tessy Plastics Campaign

Plant Expansion:
- 100,000-sq-foot addition for equipment and employees
- Accommodate increased orders for medical and consumer products

Objective:
- Reduce peak energy demand
- Improve energy savings

Focus:
- Replaced standard hydraulic injection molding machines
- Installed more efficient process chillers, water pumps and waterside economizers

NYSERDA: Tessy Plastics Campaign

RESULTS

- Saved $727,000 with the new injection molding machines.
- Other equipment saved an additional $43,900 with a simple payback of less than a year.
- The new process chiller saved another $16,100.

Energy Savings: 8 million kWh/yr
NYSERDA IPE Incentives: $978,000

Luthin Associates, Inc.
ENERGY MANAGEMENT CONSULTING

An Independent Contractor to nyserda
Energy. Innovation. Solutions.

For more information…

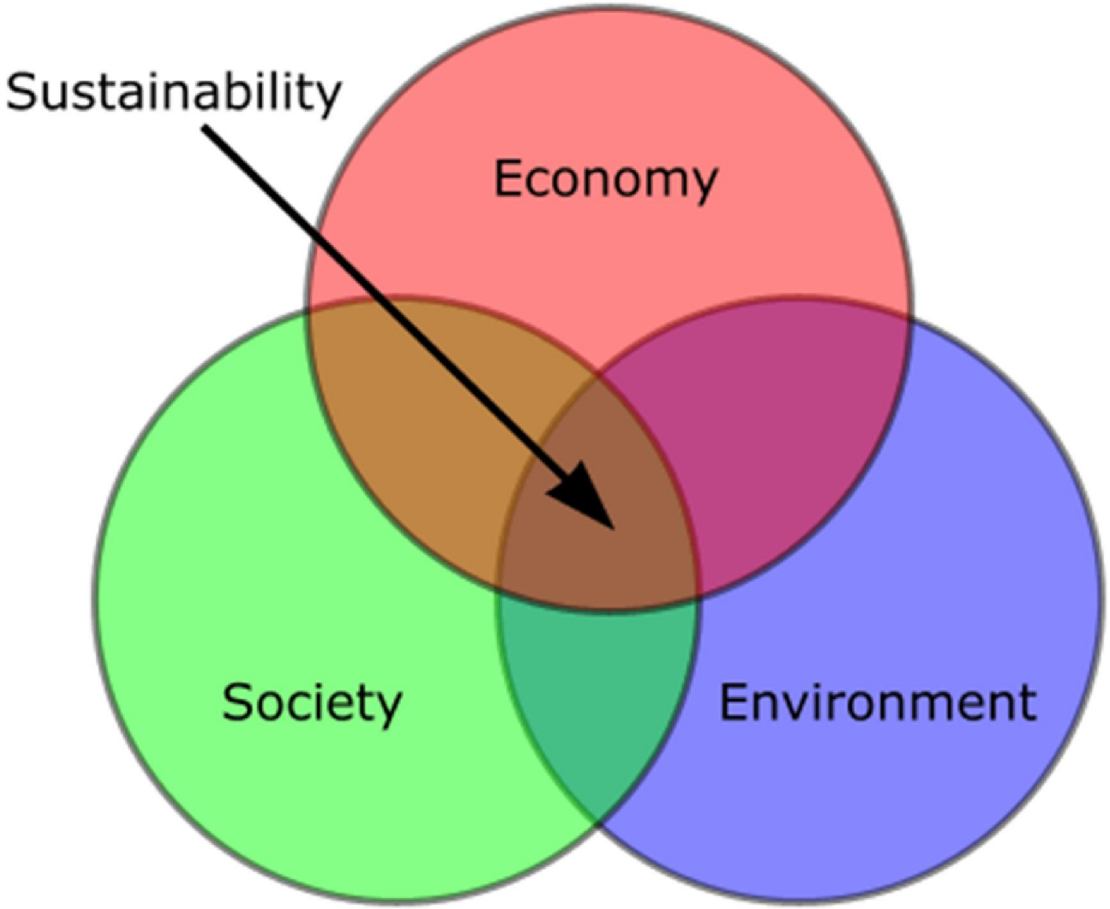
- NYSERDA's main website: http://www.nyserda.ny.gov/
- Existing Facilities Program: http://www.nyserda.ny.gov/existing-facilties
- FlexTech Program: http://www.nyserda.ny.gov/flextech
- New Construction Program: http://www.nyserda.ny.gov/new-construction

Lina Kohandoust
Email: lkohandoust@luthin.com
Phone: 518-336-562

Leveraging Sustainability with Waste Contracts

Lessons Learned at Lourdes Hospital

Sustainability



Dep't of Green Initiatives Goals and Responsibilities

Environmental Efficiency

- Reduce Carbon Footprint:
  - GHG Emissions
  - Landfill Space Reduction
  - Keep Green Space “green”
  - Reduce Urban/Overland Runoff
- Reduce Costs of Disposal:
  - Reduce; Reuse; Recycle and Restore

Funding

1. Leveraging Accounts
2. Green Appeal
3. Grants

Leveraging Accounts

- Solid Waste Management:
  - Domestic trash
  - Recycling
  - Compost
- Document Destruction
- Facilities Management
- Environmental Services

Waste Management Pays for Green Appeal

- Paper over Styrofoam
- Zero Waste
- Compost
- Feed to Farm
- Buying Recycle Bins
- Funding VISTA position

Energy Conservation Grants

- State Energy Providers:
  - NYSEG – New York State Electric and Gas
- State Energy Conservation Programs:
  - NYSERDA – New York State Energy, Research and Development Authority

Expenses and Savings

	Solid Waste and Recycling Data - 2012						
	Tons	%	Costs	Revenue	Avoidance	Landfill Cubic Foot (CF) Offset	CO2 (Metric Tons Carbon Equivalent)
Garbage	667.0	65.2	$ 86,000	$ -	$ -		667.0 Produced
McKilligan Oil	3.5	0.4	$ -	$ -	$ 2,473	124	11.5 Offset
Paper	187.0	18.3	$ 22,064	$ -	$ 11,396	6,545	645.0 Offset
Compost	46.0	4.5	$ 9,000	$ -	$ 2,798	1,610	41.0 Offset
GTP	25.0	2.5	$ 6,375	$ -	$ 1,521	875	67.0 Offset
Cardboard	94.0	9.2	$ 3,000	$ 8,266	$ 5,718	3,325	288.0 Offset

Total without Garbage	**$ 40,439**

1052.5 Total
667.0 Total Produced
385.5 Net Offset

	Tons	%	Costs		Avoidance	Avoidance + Revenue	Cu Ft Offset	
Totals	**1,022.5**	**100.0**	**$ 126,439**		**$ 23,906**	**$ 32,172**	**12,479**	

334,540,800 cubic feet in a mile

Broome County Landfill Expansion

Feed to Farms

Natural By Nature
Richard Herb
2334 Little Meadows Road
Warren Center, PA 18851
(570) 395-3585 or (607) 237-4744

I'm pleased to let you know that we have passed the half-way point of 2012 and together we have collected over ***45,000*** pounds of compost and feedstock material!

I'm pleased to let you know that we have passed the half-way point of 2012 and together we have collected over ***45,000*** pounds of compost and feedstock material! This not only has kept useable material out of our local landfills, but once separated has also become useful animal feed. Because of programs like this, in 2011, over 6,000 pounds of pork and chicken products was produced for farm families in Bradford County, PA and surrounding areas. Natural By Natures agreement with these families are to supply them at no cost with wholesome produce, grain and dairy products that no longer can be offered for retail sale due to damage or past date situations. The agreement also prohibits the sale of these animals by families receiving the food benefits as the intended use is for immediate family, friend and relative consumption.

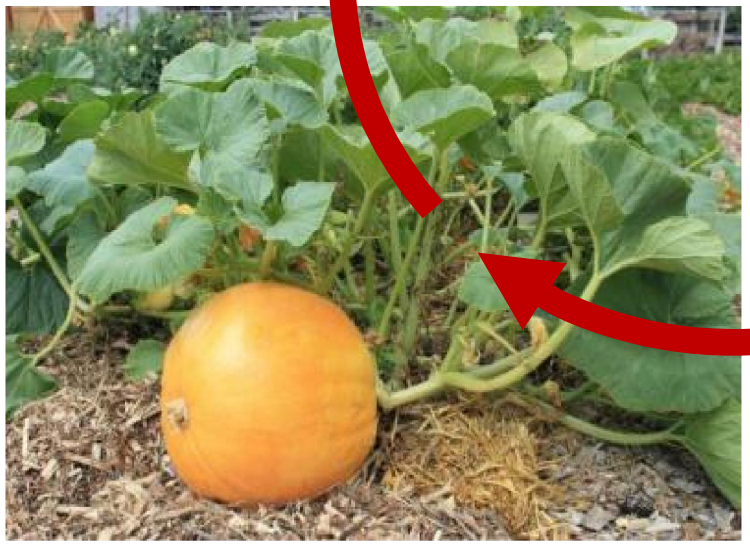
Currently, Natural By Nature is researching development in raising its own pork, as we are working with USDA inspected slaughter houses and processing plants. Our hopes are to create a wholesome food source for area food banks from food otherwise discarded.

We are off to having another successful year in 2012 thanks to your participation and help. Thank you for your continued hard work and support!

Respectfully,

Rich

Compost



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Creating and Sustaining Recycling Programs at Hospitals

By:

- Wayne Morton, EHS Manager

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"We at RGH recognize that sustaining a healthy environment is essential to maintaining both personal and public health."

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Principles of Successful Recycling

- Over thinking it pit fall
- Waiting for the right time
- New employee orientation
- Safety surveillance rounds

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Orientation slide example

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Costs and costs savings

- No additional labor cost to date
- Municipal verses RMW rates
- Partnering with your waste vendor
- Availability of data
- Costs of non compliance and fines

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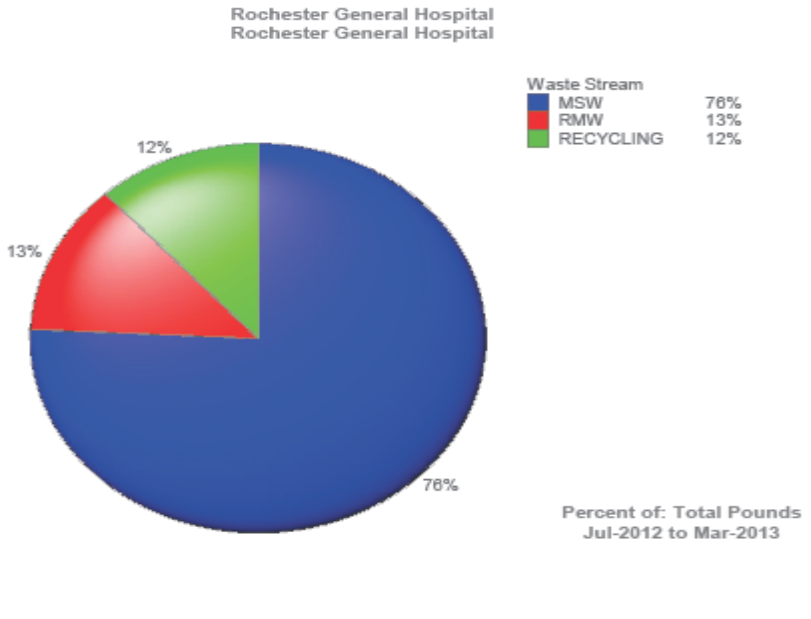

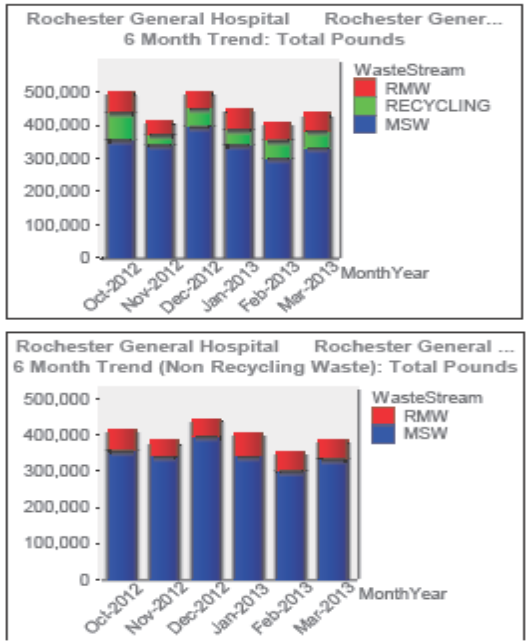

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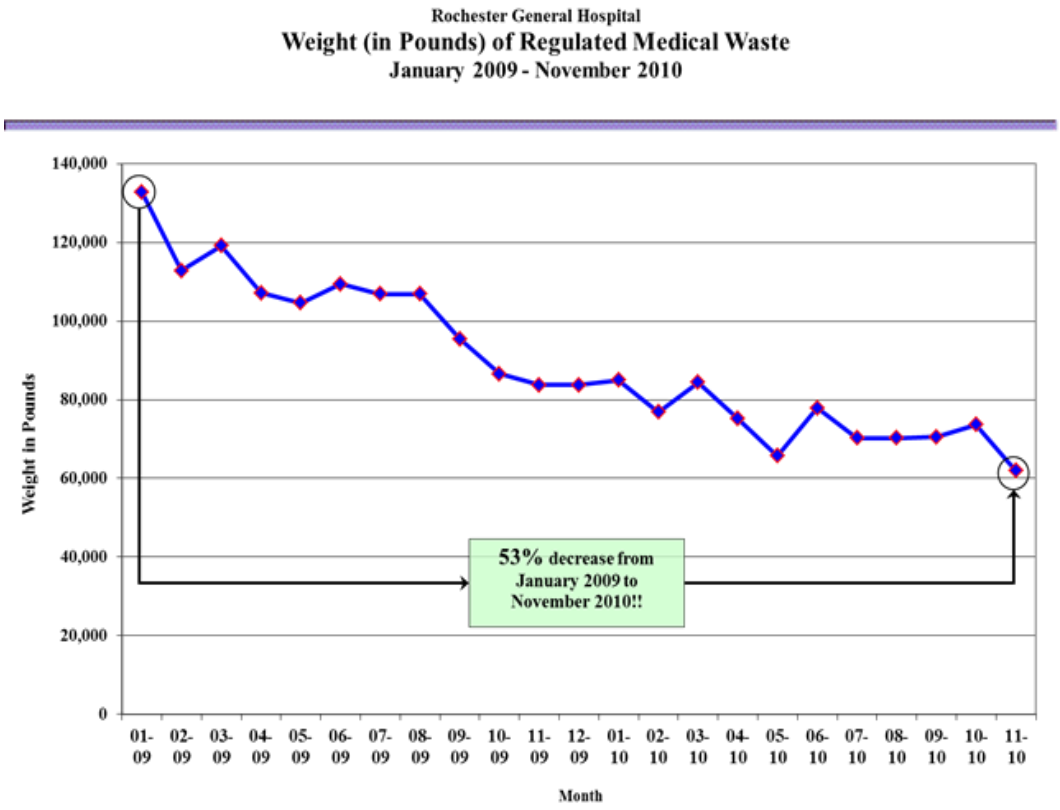
- Use actionable Data
- Benchmark
- Go after the "Low hanging fruit"



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Benefits of Recycling

- **Community recognition**
- **Attracting “green” consumers**

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- **Incorrect containers in patient rooms and operating rooms**
- **Wrong size, wrong location in room**
- **Partner with your vendor**

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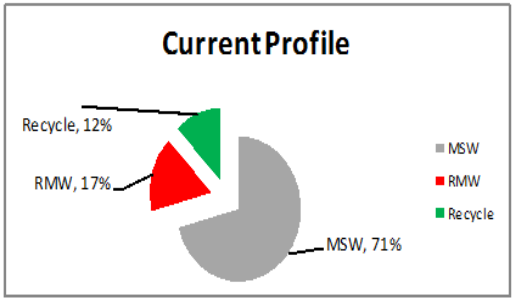
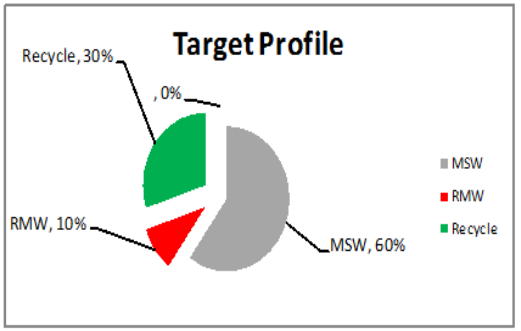
Summary

- **Buy in starts from the top down**
- **Establish Goals**
- **Celebrate success**





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Next Steps?