Shaping the Future of Health Care: Using QI Frameworks and Methodologies for Process Improvement

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Ronald Reagan UCLA Medical Center
Los Angeles, CA, USA

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Learning Objectives

- Identify a plan and process to establish a QI Scholarship Program for health care practitioners.
- Evaluate QI methods and tools that facilitate understanding of an underlying health problem as well as improving health care processes and outcomes.
- Demonstrate how a QI Scholarship Program can increase the requisite knowledge and skills to effectively participate in QI.

Background

Challenges in Healthcare

- Rising costs of supplies, labor, and equipment
- Difficulty in balancing the need to improve with our daily demands
- Increasing regulatory requirements
- Meeting patient satisfaction goals
- Competition to draw our patients away
- Reimbursements and Healthcare Reform

How Do We Meet these Challenges?

Taking a Different Approach

“I’ve got too much work to do to stop and listen to you”

“The Tools Are Available”

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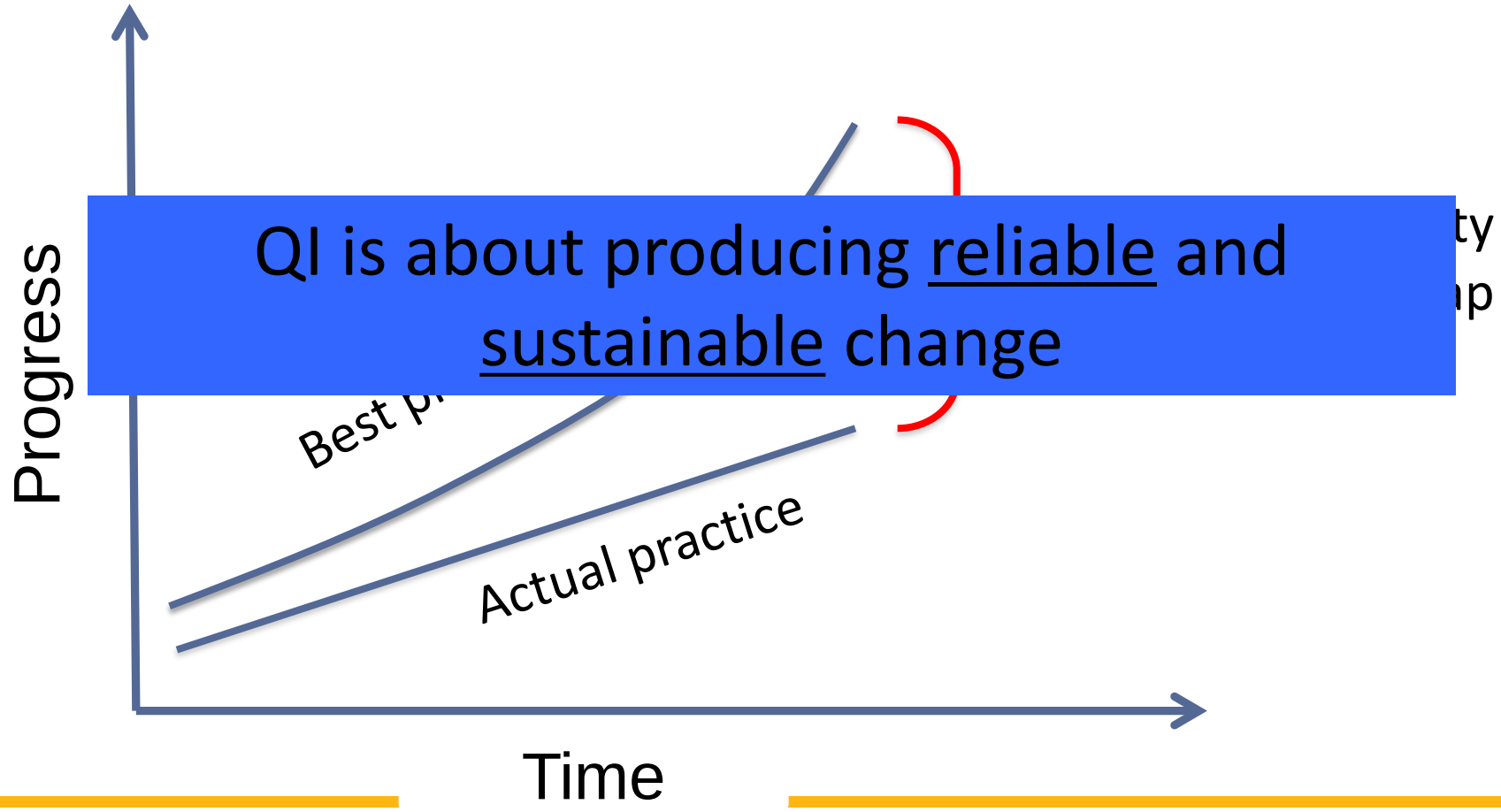


QI is about producing reliable and sustainable change

What is Quality Improvement?

- Systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted patient groups
- Principles of QI:
  - QI work as systems and processes
  - Focus on patients
  - Focus on being part of the team
  - Focus on use of the data
- Quality is Everyone's Responsibility
  - Engage all nurses, not just nursing leadership

QI Scholarship Program

- Call for Applications
- Training Schedule
- Project Timeline
- Scholarship Stipend

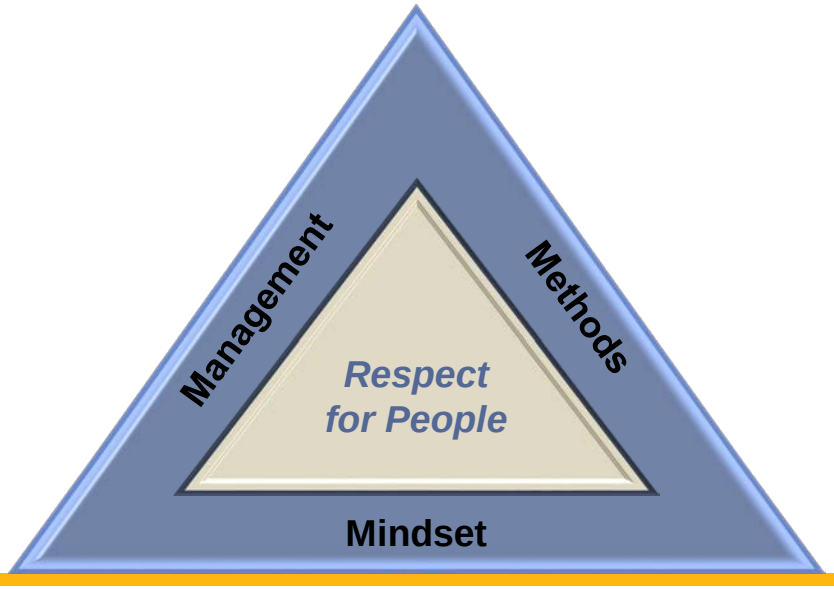
Process

- LEAN methodology and A3 Tool
- Problem Statement
- Current State and Best Practices/Literature Search
- Goal of the project
- Root Cause Analysis
- Solutions
- Check
- Act

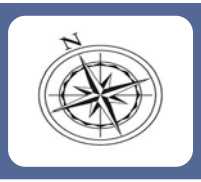
Step 1:
Establish QI/Lean Framework

Lean Definition

A management system and culture designed as a way we work by adding value for our patients and eliminating waste, where every employee is empowered to continuously improve their processes.



Lean is Based on a Few Important Concepts…

 Value	• What patients are willing to pay for • Patients: clinician time
 Waste	• Waste hides in complex systems • Patients: Waiting for appointments
 Scientific Method	• PDSA and A3s can be leveraged to solve problems
 Empowered Staff	• Involve and engaged staff: will "own" changes; experts in their area
 Alignment	• Limited siloed improvement => few critical strategies to focus and advance goal

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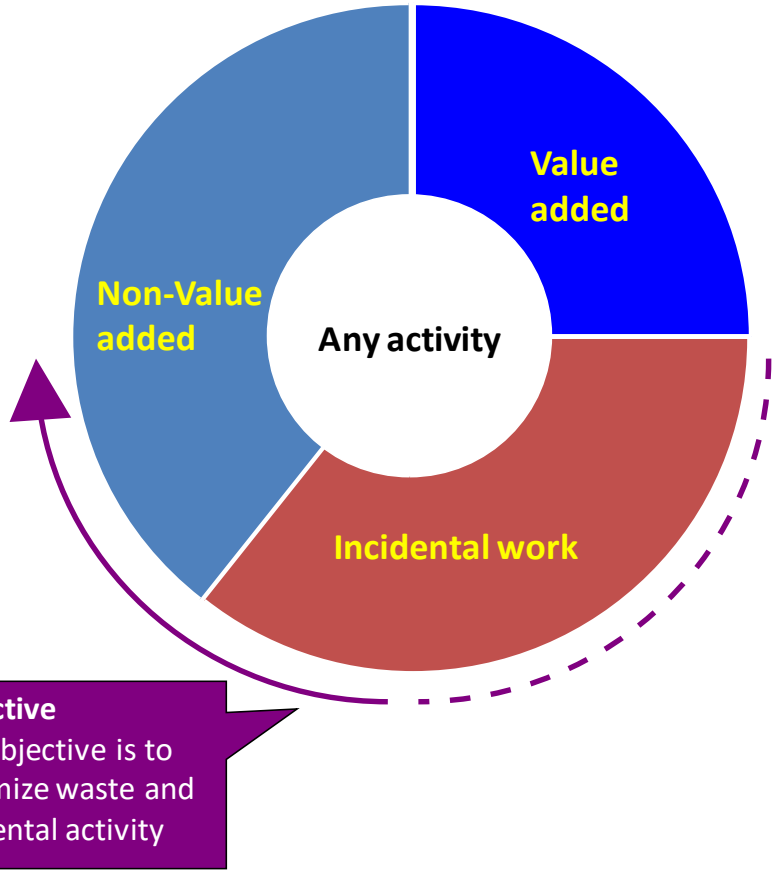
Value-Added & Non-Value Added

Waste = anything that does not add value for the customer

Three types of activity

1. Non-value added = waste
2. Incidental = waste but necessary
3. Value added
    a. Adds value from the customer's perspective
    b. Customer is willing to pay for it



Waste Categories

Defects

Correcting errors or reworking processes

Extra-Processing

Over-processing, unnecessary steps, signatures, reviews

Overproduction

Producing too much, or producing too soon

Motion

Any motion that does not add value; searching for supplies or equipment

Waiting

Waiting for an appointment, for signatures, for a printer that has a long queue

Inventory

Any more stock than the minimum to get the job done

Transport

Any non-essential transport

Not Utilizing Talent & Knowledge

Not utilizing the time, talents and knowledge of people

5S: Method to Eliminate Waste

Purpose & Definition

A strategy to develop and maintain a working environment that is clean, organized, and in the correct place

Benefits

- Reduces searching
- Highlights problems
- Improves morale
- Improves safety
- Gain flow

5S: Method to Eliminate Waste

SORT

Remove unneeded items

STRAIGHTEN

Organize based on location and frequency of use

SHINE

Keep the workplace clean, daily

STANDARDIZE

Develop a consistently organized workplace

SUSTAIN

Establish a system for ongoing support for the first 4 Ss

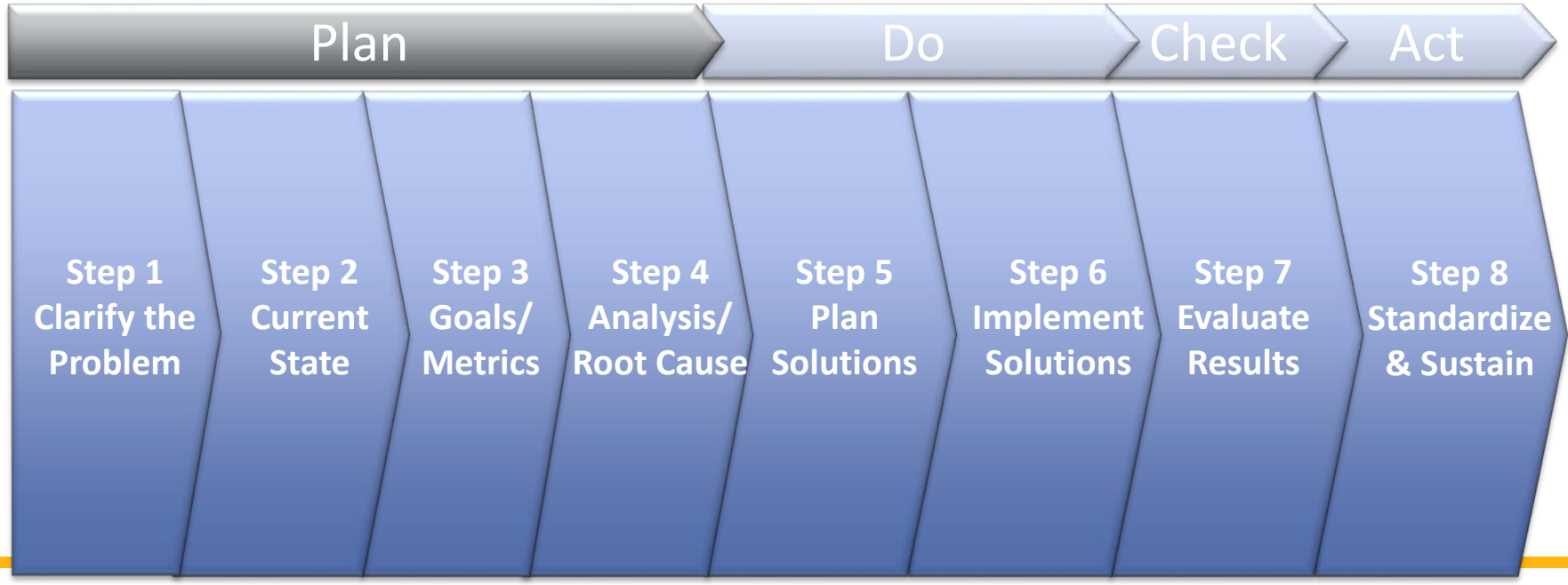
5S: Method to Eliminate Waste

Before 5S:

After 5S:

PDCA: Continuous Improvement

- The method by which we should be practicing continuous improvement in our daily work
- A tool to solve problems encountered while performing our daily work



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A3* Project Title

Project Lead:
Project Champion(s):
Date Updated:

Project Team:

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Plan

Do

Study

Act

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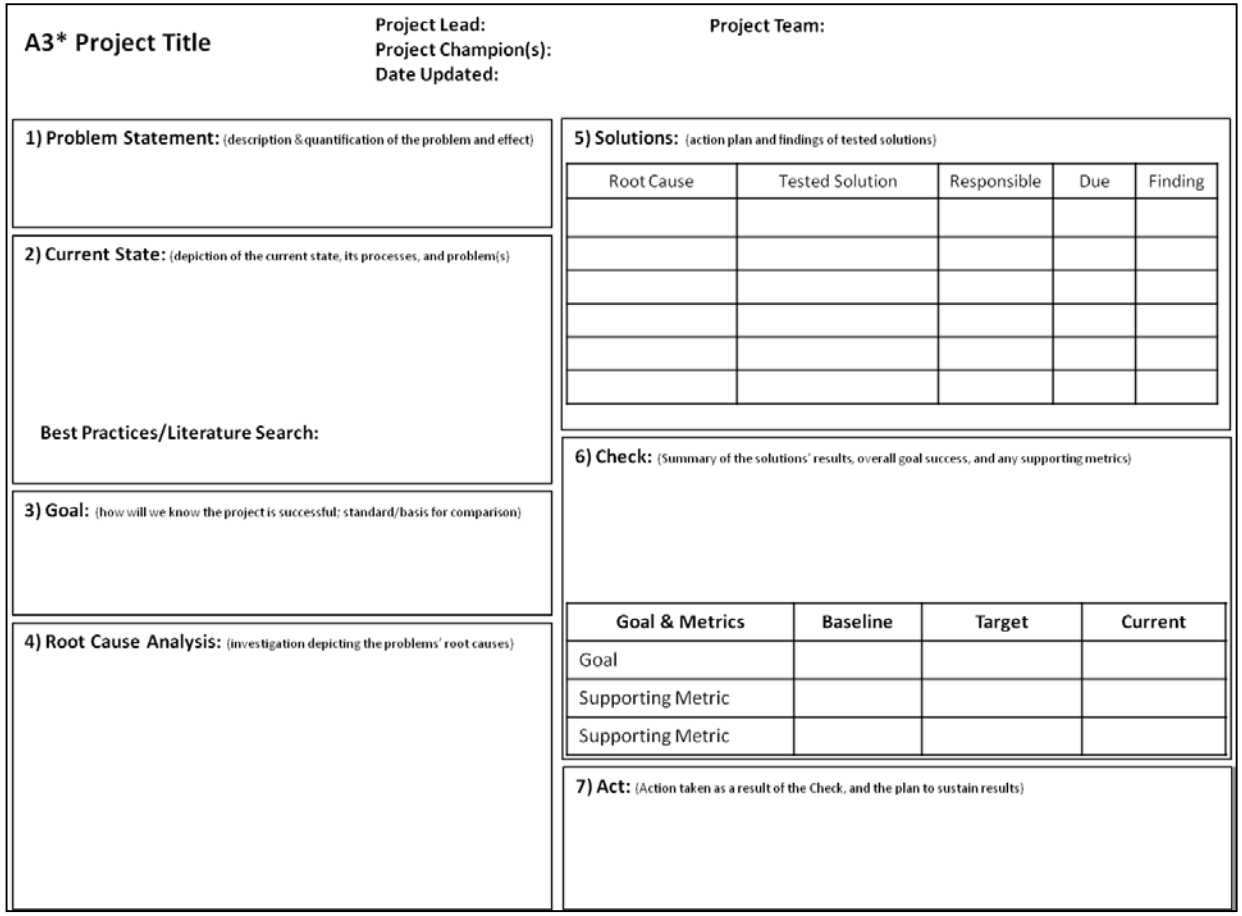
What is a Problem-Solving A3?

A3-Problem Solving

Use for:
- Complex problems
- Gaining consensus
- Communicating
- Managing the project

Use if:
- Root Causes to problems are unknown
- Solutions aren't obvious



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Best Practices/Literature Search:

3) Goal: (how will we know the project is successful: standard/basis for comparison)

4) Root Cause Analysis: (investigation depicting the problems' root causes)

5) Solutions: (action plan and findings of tested solutions)

Root Cause	Tested Solution	Responsible	Due	Finding

6) Check: (Summary of the solutions' results, overall goal success, and any supporting metrics)

Goal & Metrics	Baseline	Target	Current
Goal			
Supporting Metric			
Supporting Metric			

7) Act: (Action taken as a result of the Check, and the plan to sustain results)

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Prevention of Catheter Associated UTI (CAUTI)

Date Updated: Aug 28, 2016

Project Lead: Lee Galuska, Charlene Earnhardt
Facilitator:
Project Champion(s): Zachary Rubin

Project Team: CAUTI Task Force

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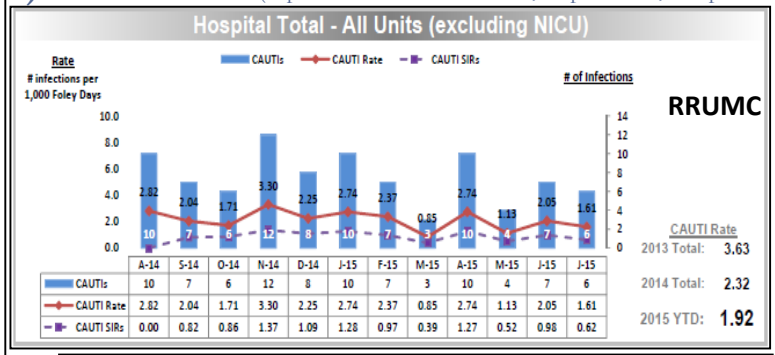
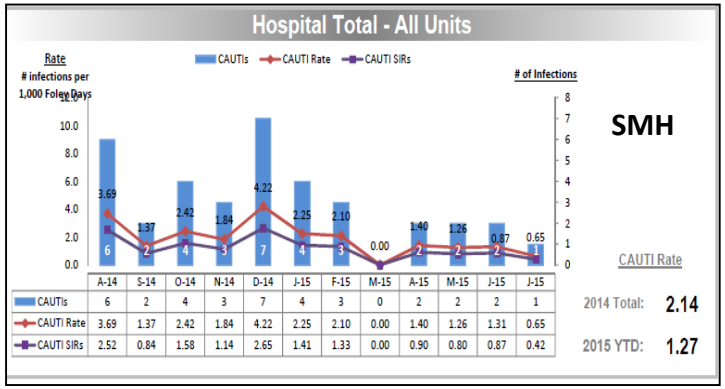
1) Problem Statement:

CAUTI is a major cause of morbidity and mortality in the hospitalized patient. CAUTI increases length of stay, antibiotic exposure, mortality and overall cost of care. It is also an important quality metric that is publicly reported by both the California Department of Public Health and CMS. CAUTIs also factor into value based purchasing and into Magnet status

2) Current State: (depiction of the current state, its processes, and problem(s)





3) Goal:

Consistently decreasing CAUTI rate, keeping standardized infection ratio <1 after CDC performs re-baseline in 2015.

4) Root Cause Analysis:

See fishbone diagram from CAUTI charter

5) Solutions: (action plan and findings of tested solutions)

Root Cause	Tested Solution	Responsible	Due	Finding
No CAUTI surveillance on acute care units.	CAUTI surveillance institution wide.	Zachary Rubin Dana Russell	Completed 4/2014	
UCLA does not have standardized removal orders for urinary catheters	Develop RN driven protocol Serial straight cath instead of Foley	Charlene Earnhardt Zachary Rubin	Completed 12/2014	Poor compliance
RN have difficulty assessing bladder volume	Purchase bladder scanners for each unit	Zachary Rubin Lee Galuska	Completed 12/2014	Delayed initially
25%CAUTIs do not have UA or normal UA	Develop urinalysis with reflex culture	Romney Humphries Zachary Rubin	Completed 12/2014	Poor compliance
No standardized response to CAUTI	Develop mini-causal analysis form for each event	Charlene Earnhardt	Completed 2/2015	Working well
No easy clinical assessment for removal of unnecessary urinary catheters	Develop CareConnect report to help identify unnecessary urinary catheters.	Elyse Fritschel Zachary Rubin	1/2016	In progress
Perceived poor RN education	NRE office targeting units with high CAUTI rates for additional competencies	Lee Galuska	ongoing	
Perceived poor MD education	Education sessions with residents and attending MDs	Elise Martin Zachary Rubin	ongoing	Started 12/2014
Urinary caths used unnecessarily in OR	Surgeons not to place for short operations Place high spinal to decrease need for Foley	Hallie Chung	ongoing	

6) Check:

The main interventions have been built within care connect and extensive education has been done for MDs and RNs.

Goal & Metrics	Baseline (2013)	Target	Current
CAUTI rate	RR: 3.6 inf/1000cath days SM: 2.14	All units SIR <1.0 (CDC to reset baseline after 2015)	RR: 1.92 SM: 1.27
Compliance of RN-driven protocol	0	75%	
Removal of unnecessary urinary catheters	Unknown	75%	Unknown

7) Act:

While most of the important infrastructure has been rolled-out, compliance with these measures is still low. Plans fro 2015-2016 include:

1. Continue increasing awareness of nurse driven protocol (NDP) among RNs and MDs.
2. Increase compliance with NDP through education—Dr. Sanjay Saint visiting on Sept 17, 18 to lecture.
3. Increase utilization of serial straight cath—Dr. Sanjay Saint visiting on Sept 17, 18 to lecture.
4. Developing CC report on unnecessary urinary catheters.

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Step 2:
Understanding the Problem

Comparison of Mapping Techniques

Process Map

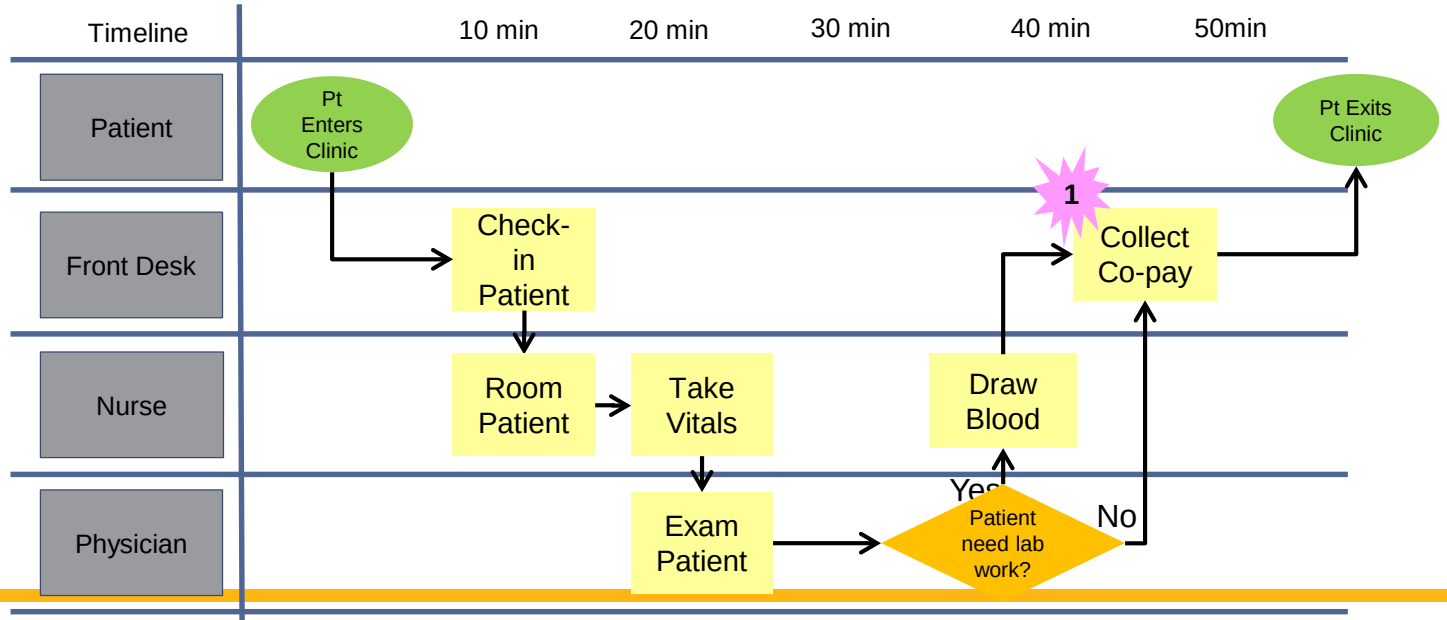
- Graphical representation of a defined process
- Improvements are usually very small – but easy to implement
- Enables short term tactical planning

Value Stream Map (VSM)

- Focuses on improving the whole, not optimizing pieces of the process
- Identifies non-value added activities "within" & "between" the process
- Enables a long term strategy

How to Draw a Process Map

1. Define Boundaries (Where the process starts and stops)
2. List Functions
3. List Process Steps According to the Functions that Performs It
4. List Key Milestones or Running Time Across the Top
5. Identify Opportunities



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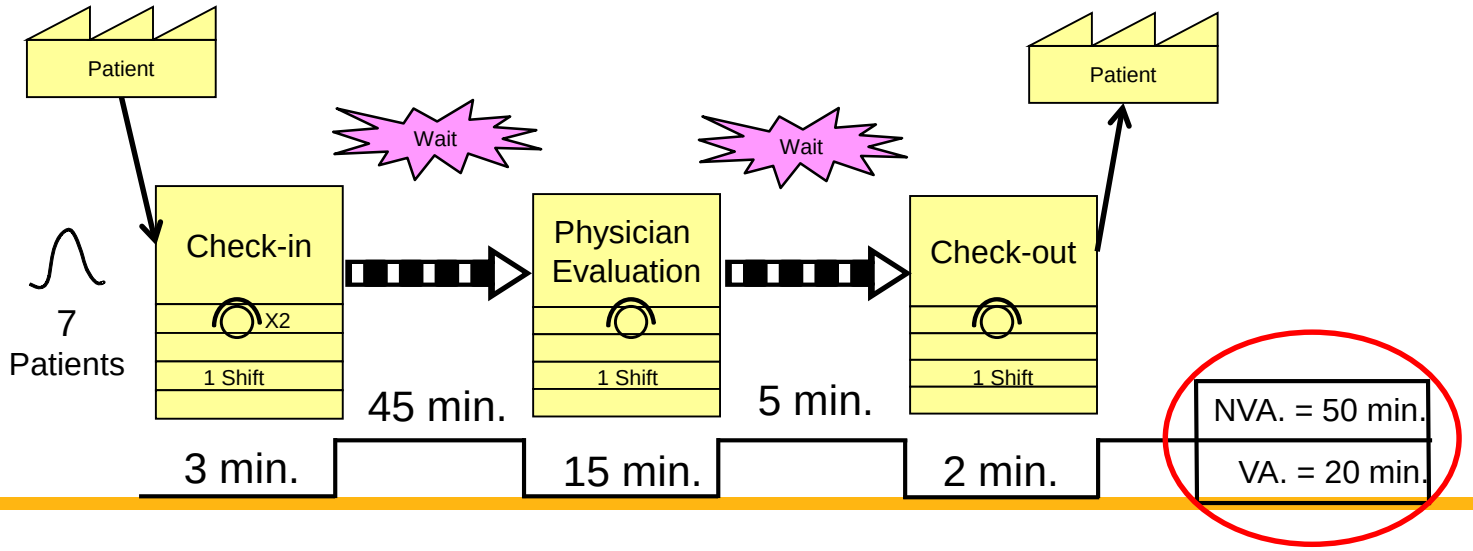
Opportunity: 20% of co-pays are not collected

How to Create a VSM

1. Define customer and supplier
2. Identify high level processes
3. Gather and document process data and information
4. Determine flow of information and materials
5. Calculate total value added and non-value added time
6. Analyze data and information to identify opportunities



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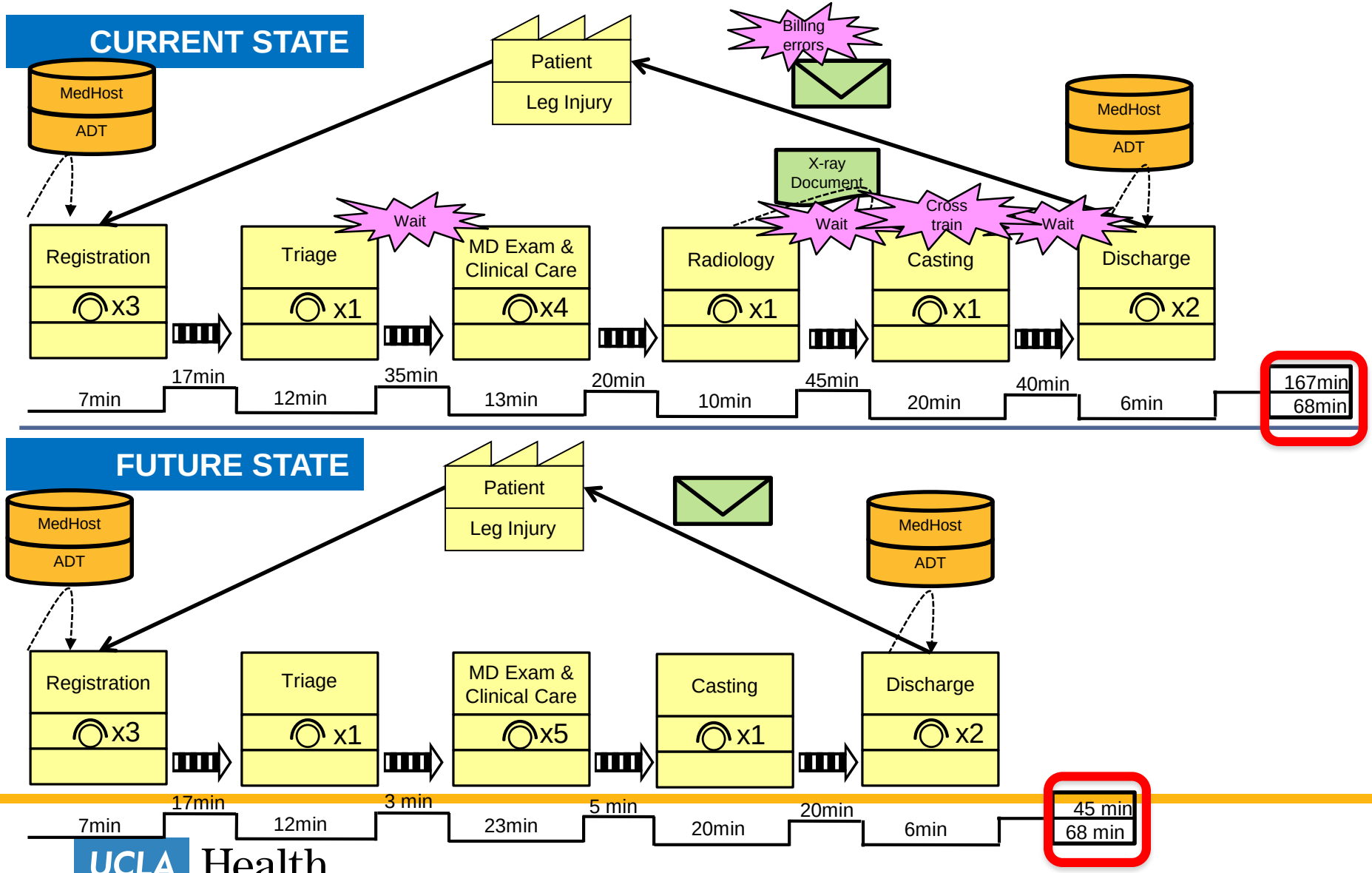
Future State Value Stream



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Date Updated:

Project Team:

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Best Practices/Literature Search:

3) Goal: (how will we know the project is successful; standard/basis for comparison)

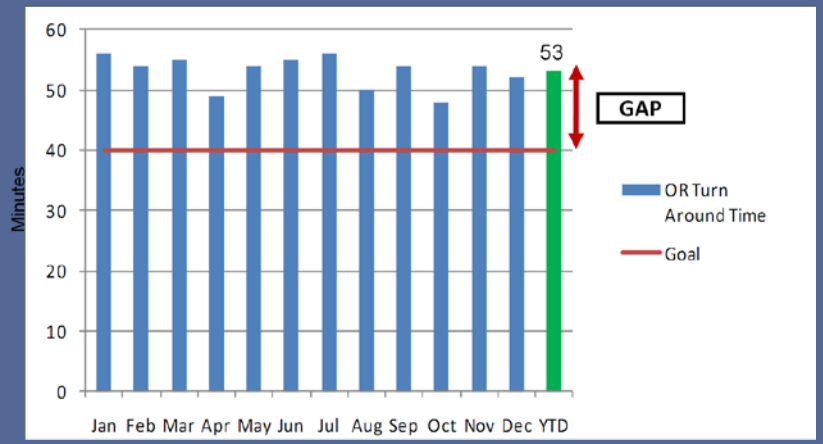
4) Root Cause Analysis: (investigation depicting the problems' root causes)

DO

- Describe the problem
- Quantify the gap between the problem and the ideal
- Describe the effect/impact of the problem

DON'T

- Don't include the solution



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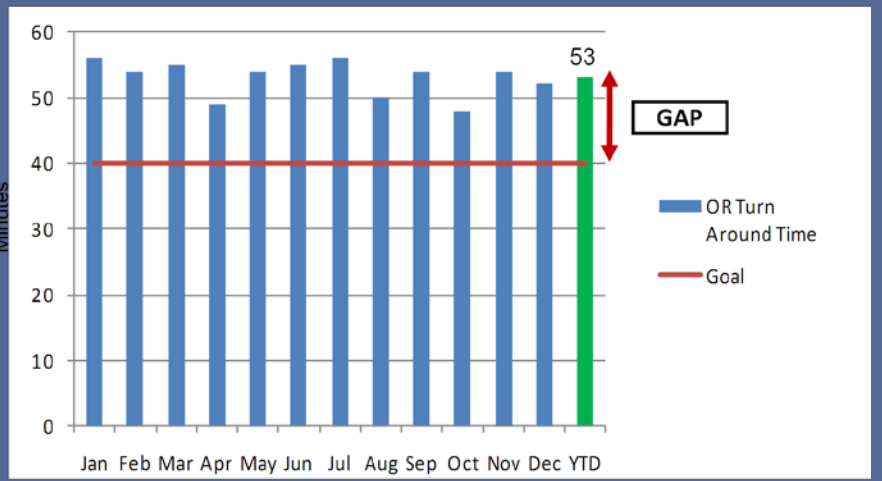

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4) Root Cause Analysis: (investigation depicting the problems' root causes)

- Observe, document, & study the current state
- Observe it with your own eyes
- Document it so it can be analyzed
  - Value Stream Map
  - Process Map
  - Spaghetti Diagram
  - Interview experts (pain points)

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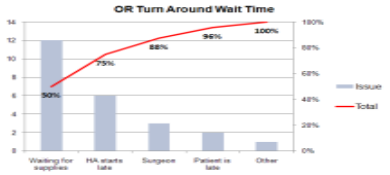
-No signal when a room is clean
-Waiting for supplies = 20 mins



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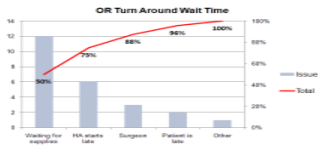

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Define the Goal

- Ask: what is the ideal outcome?

Goal Elements

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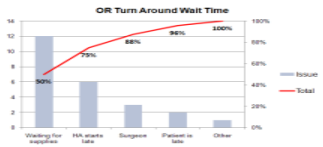

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Improve OR turnaround time from 53 minutes to 40 minutes (25%) by October 1, 2017.

4) Root Cause Analysis: (investigation depicting the problems' root causes)

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Step 3:
Identifying Areas for Improvement

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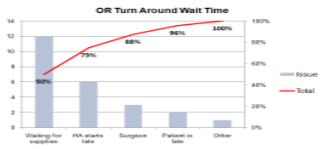

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4) Root Cause Analysis: (investigation depicting the problems' root causes)

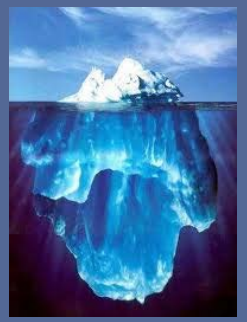
The Current State tells the "facts".

Root Cause Analysis :

- Examines underlying, not "surface" causes
- By asking "Why" as much as necessary to get closer to the solution
- To eliminate the problem permanently: If we do not fix the root cause, the problem will usually resurface

Tools:

- 5 Whys
- Fishbone



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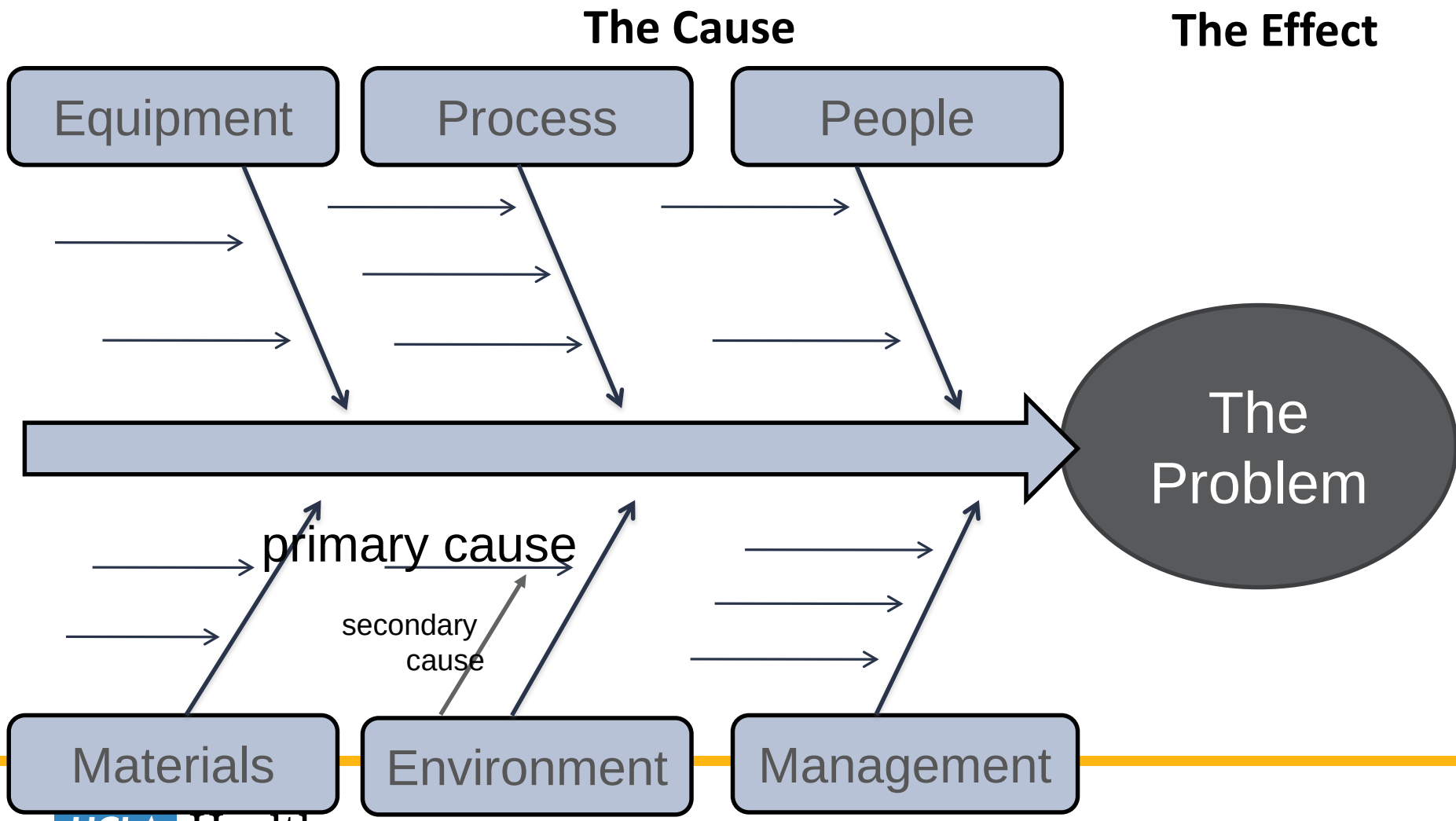
Jefferson Memorial Dilemma

- Problem: The granite of the Jefferson Memorial is crumbling at an increased rate
  - Why?
- Washed more frequently
  - Why?
- Because it needs to be cleaned more often
  - Why?
- A large bird population leads to increased waste
  - Why?
- Large number of spiders for birds to eat
  - Why?
- Large number of midges to eat
  - Why?
- Because midges are attracted to the lights, which are turned on before dusk

Fishbone Diagram



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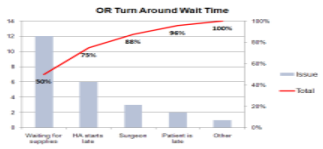

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4) Root Cause Analysis: (investigation depicting the problems' root causes)

OR Turnaround Time is higher than target

⬇

Why? Hospital Assistant starts late

⬇

Why? Does not have surgery room assignments on time

⬇

Why? OR room schedules not distributed before shift starts

⬇

Why? OR secretary not informed to distribute schedules before shift

Do

Study

Act

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Step 4:
Devising a Measurement Strategy

Uh… where to go for data?

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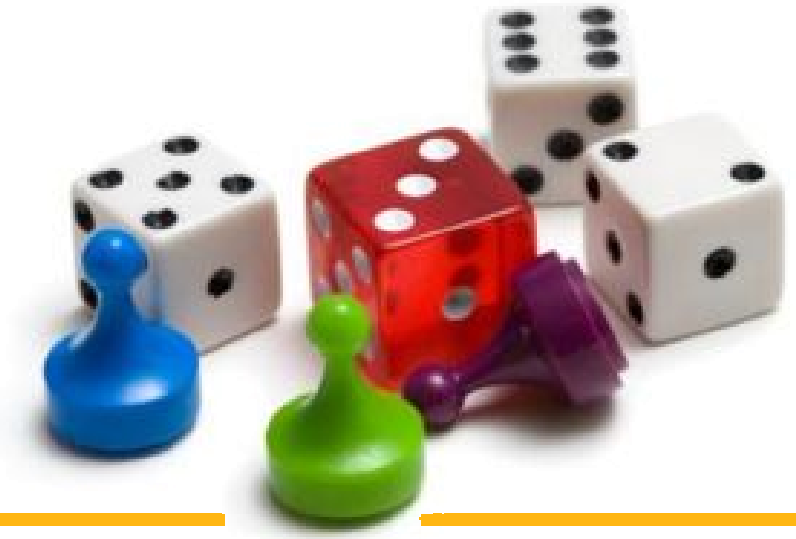
Devising a Measurement Strategy

Collecting data is challenging, but allows to you ensure the problem you are fixing will result in improved outcomes!

But what to measure?

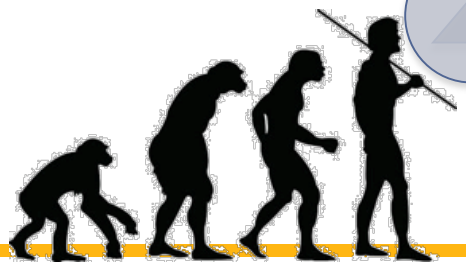


Deciding What to Measure

Outcomes
(patient level results)

Process:
(actions)

Structure
(equipment)



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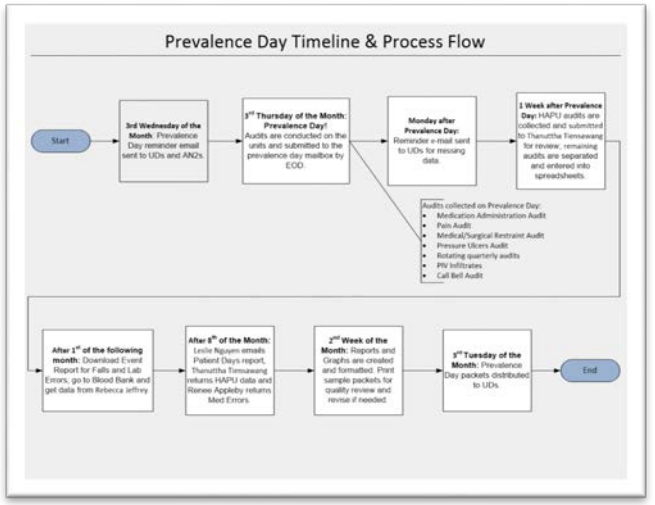
Data Collection Process

Where the Data Comes From:

- Prevalence Day
- NRC Picker (inpatient) and Press Ganey (outpatient) Patient Surveys
- Event Reports
- Ad Hoc Audits
- Finance
- Infection Control



Data Concerns:

- Validity and reliability of data
- Measureable and observable
- Sustainability

UCLA Health

Nursing Dashboard

All Inpatient Nursing Units - Performance Dashboard

RR UCLA Medical Center Performance Dashboard All Inpatient Nursing Units	Target	Threshold	FY 2012 Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12
Quality											
Infection											
C. Difficile Rate per 10,000 Patient Days - Med/Surg[1]	10.5	<10.5: green; 10.5 - 14.0: yellow ; 14+: red	13.57			12.60					
C. Difficile Rate per 10,000 Patient Days - ICUs[1]	12.2	<12.2: green; 12.2 - 14.0: yellow ; 14+: red	8.25			7.51					
VRE Rate per 1,000 Patient Days - Med/Surg[1]	0.41	0-.41: green; .41-1: yellow ; 1+: red	0.85			0.71					
VRE Rate per 1,000 Patient Days - ICUs[1]	1.05	0-1.05: green; 1.05- 2: yellow ; 2+: red	1.05			1.05					
MRSA Rate per 1,000 Patient Days - Med/Surg[1]	0.22	0-.22: green; .22-1: yellow ; 1+: red	0.27			0.12					
MRSA Rate per 1,000 Patient Days - ICUs[1]	0.17	0-.17: green; .17-1: yellow ; 1+: red	0.07			0.38					
VAP Rate per 1,000 ventilator days - ICUs Only[1]	0.38	0-.38: green; .38-1: yellow ; 1+: red	0.20			0.00					
BSIs per 1000 Central Line Days - Med/Surg[1]	1.00	0-1.0: green; 1.0 - 2: yellow ; 2+: red	1.50			2.90					
BSIs per 1000 Central Line Days - ICU[1]	0.75	0-.75: green; .75-1.2: yellow ; 1.2+: red	1.20			1.50					
CVC Compliance Bundle Checklist (ICUs only)[2]	100%	>95: green; 90-95%: yellow ; <90%: red	93%	96%	88%						
Hand Washing Between Patient Contact (MAPS) RNs/CPs[3]	100%	>95: green; 90-95%: yellow ; <90%: red	83.0%	89.0%	94.0%	97%	97%	96%	97%	96%	
Pressure Ulcers											
# Pts with Hospital Acquired Pressure Ulcers[4]	0		7	3	4	2	4	3	1	3	6
Percent of Patients with Hospital Acquired Pressure Ulcers[4]	3.80%		1.49%	0.60%	0.80%	0.40%	0.86%	0.60%	0.20%	0.60%	1.30%
Medication Errors											
Medication - Wrong Patient[5]	0	0: green; 1: yellow 1+: red	0	2	3	1	1	0	0	1	
Medication - Wrong Dosage[5]	0	0: green; 1-4: yellow 4+: red	13	11	6	4	15	11	5	12	
Medication - Nurses Checked ID Prior to Med Admin (NRC)[6]	92.5% (90th percentile)	>90%tile: green; 89-50: yellow ; <49: red	90.9%			90.6%			87.2%		

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Step 5:
Implementing Small Tests of Change

A3* Project Title

Project Lead:
Project Champion(s):
Date Updated:

Project Team:

UCLA Health

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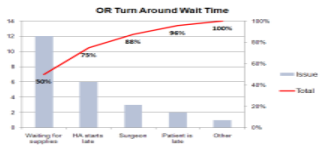
OR turnaround time currently averages 53 minutes, (should be 40). This leads to delays in surgery start times throughout the day and impacts patient care.

2) Current State: (depiction of the current state, its processes, and problem(s)

-15 surgeries a day
-No signal when a room is clean
-Waiting for supplies = 20 mins



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Improve OR turnaround time from 53 minutes to 40 minutes (25%) by October 1, 2017.

4) Root Cause Analysis: (investigation depicting the problems' root causes)

OR Turnaround Time is higher than target

⬇ Why? Hospital Assistant starts late

⬇ Why? Does not have surgery room assignments on time

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Do

Study

Act

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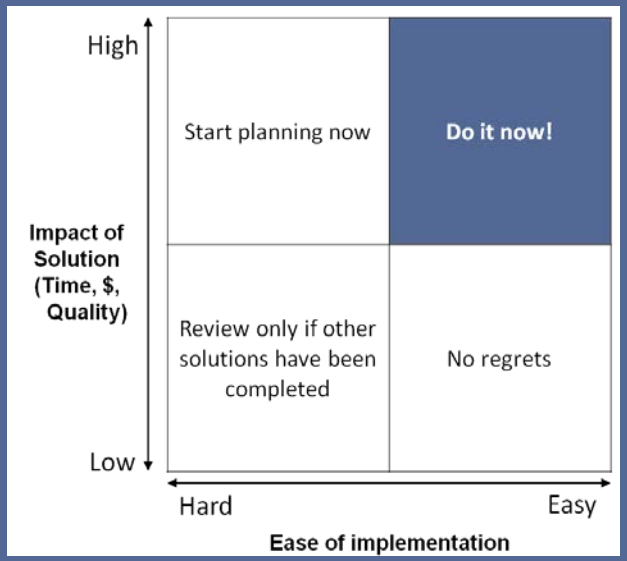
DO

- Target solutions based on the identified **root causes**
- Test & Track solutions & Findings
- Prioritize the solutions so that the action plan can be achieved



5) Solutions: (action plan and findings of tested solutions)

Root Cause	Tested Solution	Responsible	Due	Finding

Study

Act

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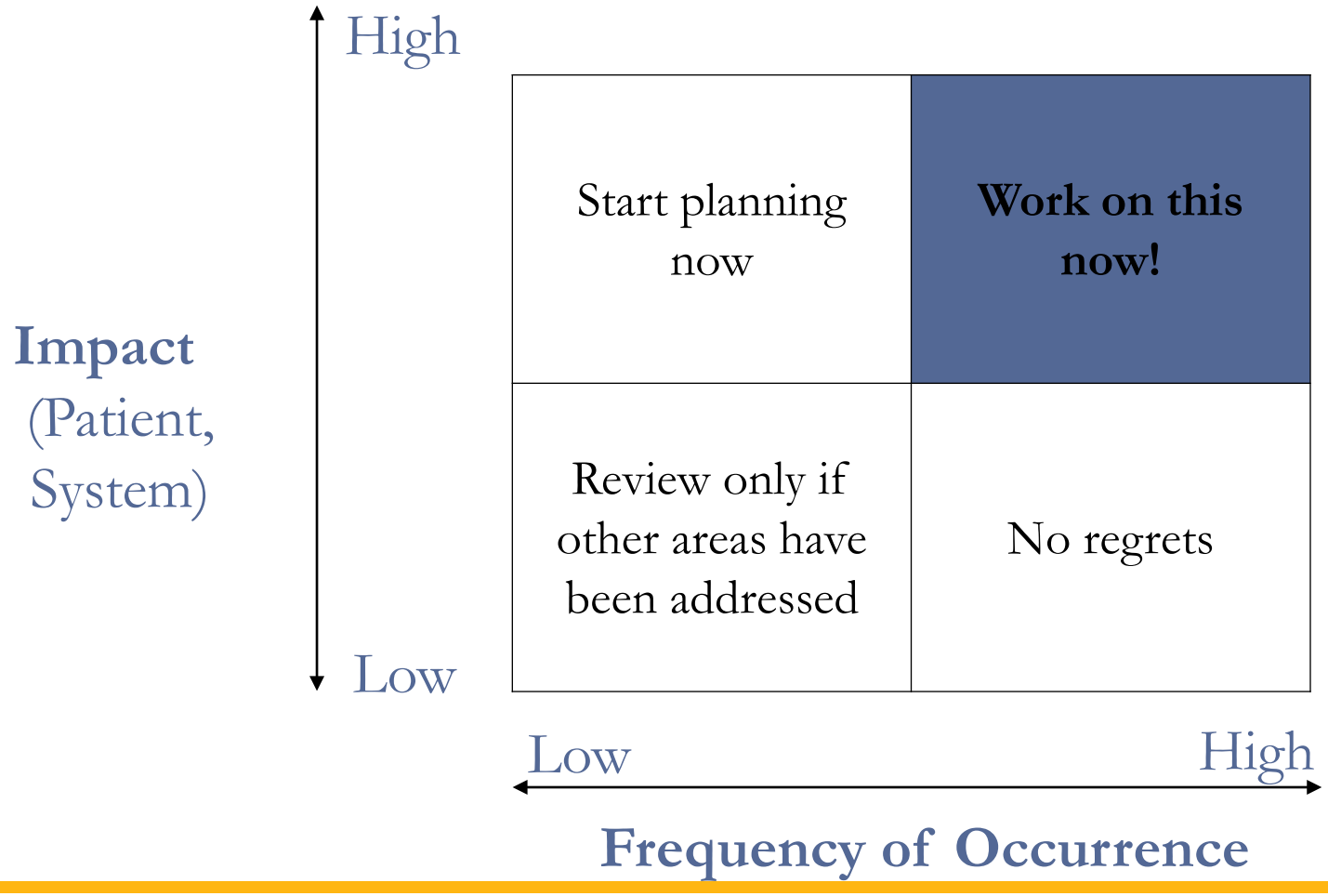
Let's Prioritize an Improvement Opportunity



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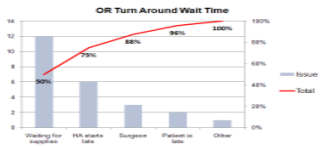

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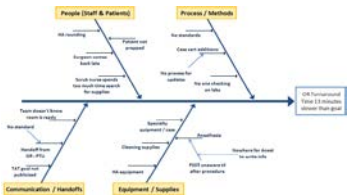

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No rounding schedule for Hospital Attendants	Rounding schedule distributed	HA Manager	10/30	Not completed

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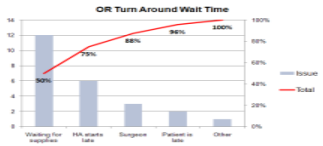

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"Check" the results of the "Solutions" and the "Goal"

- Did the tested solutions eliminate the root causes?
- Did implementation of the solutions improve the goal time?
- Are their supporting metrics that need to be tracked?
- What worked? What didn't?

5) Solutions: (action plan and findings of tested solutions)

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6) Check: (Summary of the solutions' results, overall goal success, and any supporting metrics)

Goal & Metrics	Baseline	Target	Current

Act

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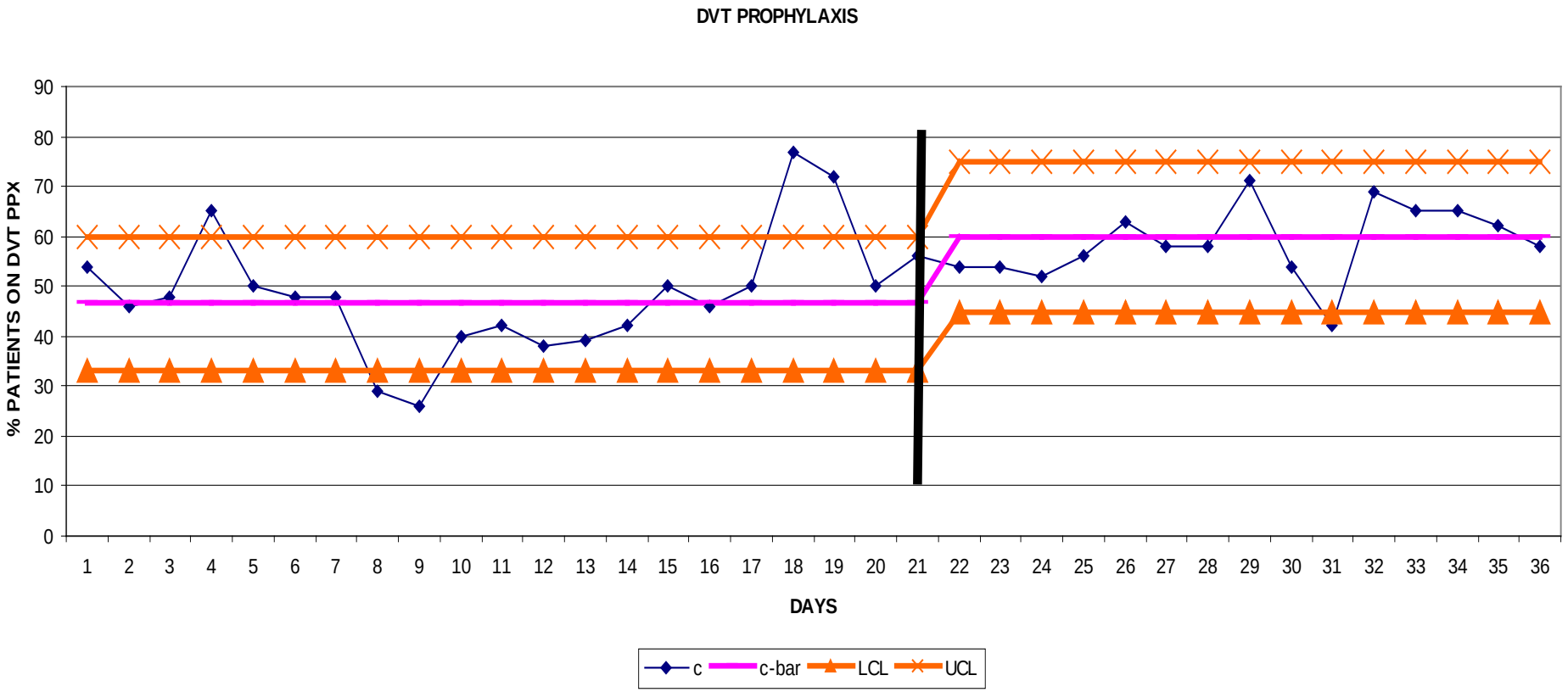
Step 6:
Measuring Change

Measuring Change with…
Statistical Process Control Charts

Statistical calculation illustrating the probability that a particular point represents random as oppose to assignable variation

- Plot 20-30 points over time
- Calculate mean or average
- Calculate upper and lower control limits (+/- three standard deviations)

Statistical Process Control Chart Example



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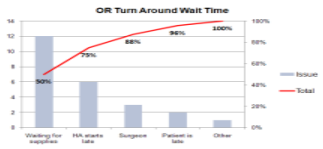

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Implementation of solutions significantly reduced OR Turn Around time. Not all solutions have been implemented yet

Goal & Metrics	Baseline	Target	Current (Dec 1st)
OR Turnaround Time (Aug-Sep 2016)	53 min	40 min	46 min
# of On Time OR Starts (Sep 2016)	10	35	15

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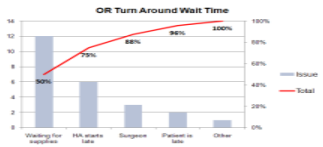

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7) Act: (Action taken as a result of the Check, and the plan to sustain results)

- OR Director to walk new room turnaround process with hospital assistants
- Project Lead to follow up on pending solutions by deadlines
- Review progress with at staff meeting, huddles → what else can be improved to eliminate 6 more minutes?

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Step 7:
Sustaining Change

Sustaining the Process

- Create readily accessible visible data to display progress over time
- Put process ownership into a group (not on to you!) that includes nursing, physicians, staff and patients
- Design the process to fit into daily work flow
- Celebrate Success

"'World peace'? — No, but we brought you a very advanced dishwashing detergent!"

References

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Thank You

Connect with me through e-mail or social media!

Anna Dermenchyan
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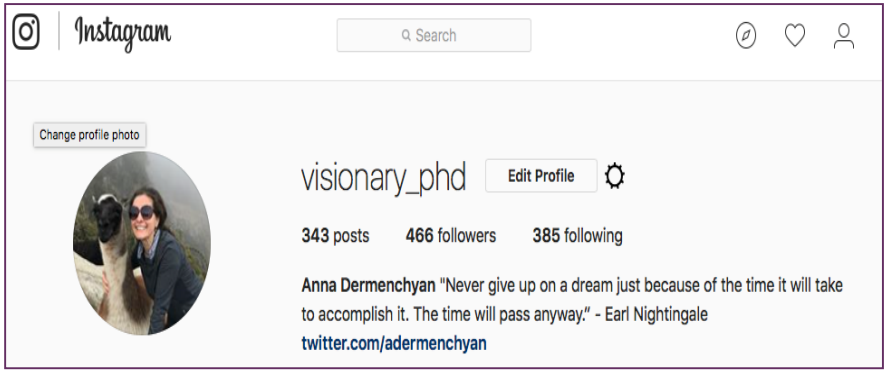
Twitter: @ADermenchyan



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