# What You Need to Know to be a Quality Ninja

## And Why it Matters

**Barbara Chase McKinney, MD, MPH**
**3 November 2016**
**LARC in Entebbe, Uganda**
**@BCMcKinneyMD**

What are your goals/expectations for today's session?

# A Story

*Leaf by Niggle* by JRR Tolkien

# Lessons Learned from Ghana's Project Fives Alive! A Practical Guide for Designing and Executing Large-Scale Improvement Initiatives



Sodzi-Tettey S, Twum-Danso NAY, Mobisson-Etuk N, Macy LH, Roessner J, Barker PM. Lessons Learned from Ghana's Project Fives Alive! A Practical Guide for Designing and Executing Large-Scale Improvement Initiatives. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2015.

## How Do You Set Up a Large-Scale Improvement Project for Success?

After seven years of rapidly and successfully scaling up high-impact maternal and child health interventions across Ghana using a QI approach, the lessons learned from *Project Fives Alive!* are finally being brought into the spotlight.

A partnership between the National Catholic Health Service of Ghana and the Institute for Healthcare Improvement in the United States, *Project Fives Alive!* stands out as a large-scale improvement initiative that harnessed the creativity of frontline workers and managers, relentlessly promoted use of local data by QI teams, and adapted its design and implementation to reflect rich and real health system lessons.

A snapshot of results as of November 2014:

- 31% reduction in under-5 mortality in 134 hospitals

- 37% reduction in post-neonatal infant mortality in 134 hospitals

- 35% reduction in under-5 malaria case fatality in 134 hospitals



**Dr. Sodzi-Tettey
Project Fives Alive! Director**

# WHY

Purpose/Expectations:

To create an <span style="color:red">improvement culture</span> where team members <u>understand</u> and <u>utilize</u> *practical QI tools*:

- to successfully complete the current LARC project

<u>and</u>

- to make continuous process improvement the way you work for the future!

# Embed Improvement in your DNA

# For Today

- Why?
- Emergency Room Simulation
- Overarching Principles
  - P + S = O; Process
  - Change Management
  - Data
  - Teams
- Overarching Tools & Methods
  - DMAIC
  - Lean / Waste
  - 5S
  - Six Sigma / Variation
- DMAIC – Tools for each Phase
- Repeat Emergency Room Simulation
- Wrap Up

# ACTIVITY

**What you will need:**

**Table top signs (Workstations)**

**Work Instructions**

**Patients (Paper Sheets)**

**Dots (Care provided = Work)**

**Timer**

**Flip Chart**

**Markers**

- Conduct an Emergency Department Simulation: <span style="color:red">Provide "care" (dots) to your "patients" (paper sheets) given your current environment – NO CHANGES ALLOWED</span>

- Follow Work Instructions

- <u>Goal</u>: "Treat" as many patients as possible in the time given (5 MIN)

- Debrief with the group

10 + 5 MIN

# Work Instructions

- Patients must be cared for in sequence. To assure proper and equitable care and they can not by-pass processes or be cared for out of order. Each dot represents a work unit of approximately 5 minutes

- Patients must be cared for properly with safety and quality in mind. Dots must be inside the circles for the procedure to meet requirements

- Patients must be escorted by Transport from the waiting room and between all processes in groups of 5. When you have completed your care-giving responsibilities, call for Transport to move the patients to the next process

- If the process runs out of dots, patients, or anything needed call for the Supplies person to order more

- Quality Assurance will inspect each patient after they have been discharged to assure that the patient has received quality care. QA will track the Quality measures and the throughput time (time from start until first batch of patients completes treatment)

- No process changes are allowed during this round as we want to understand and baseline the current process

- Run for 5 minutes. When time is up, STOP and STEP AWAY from your patients
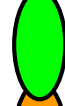
# The ED Simulation – Team Roles

**We need:**

1 Volunteer → 🔴 Quick Registration

1 Volunteer → 🟢 Triage

1 Volunteer → 🟠 Full Registration

1 Volunteer → 🔵 Treatment

1 Volunteer → 🟡 Discharge

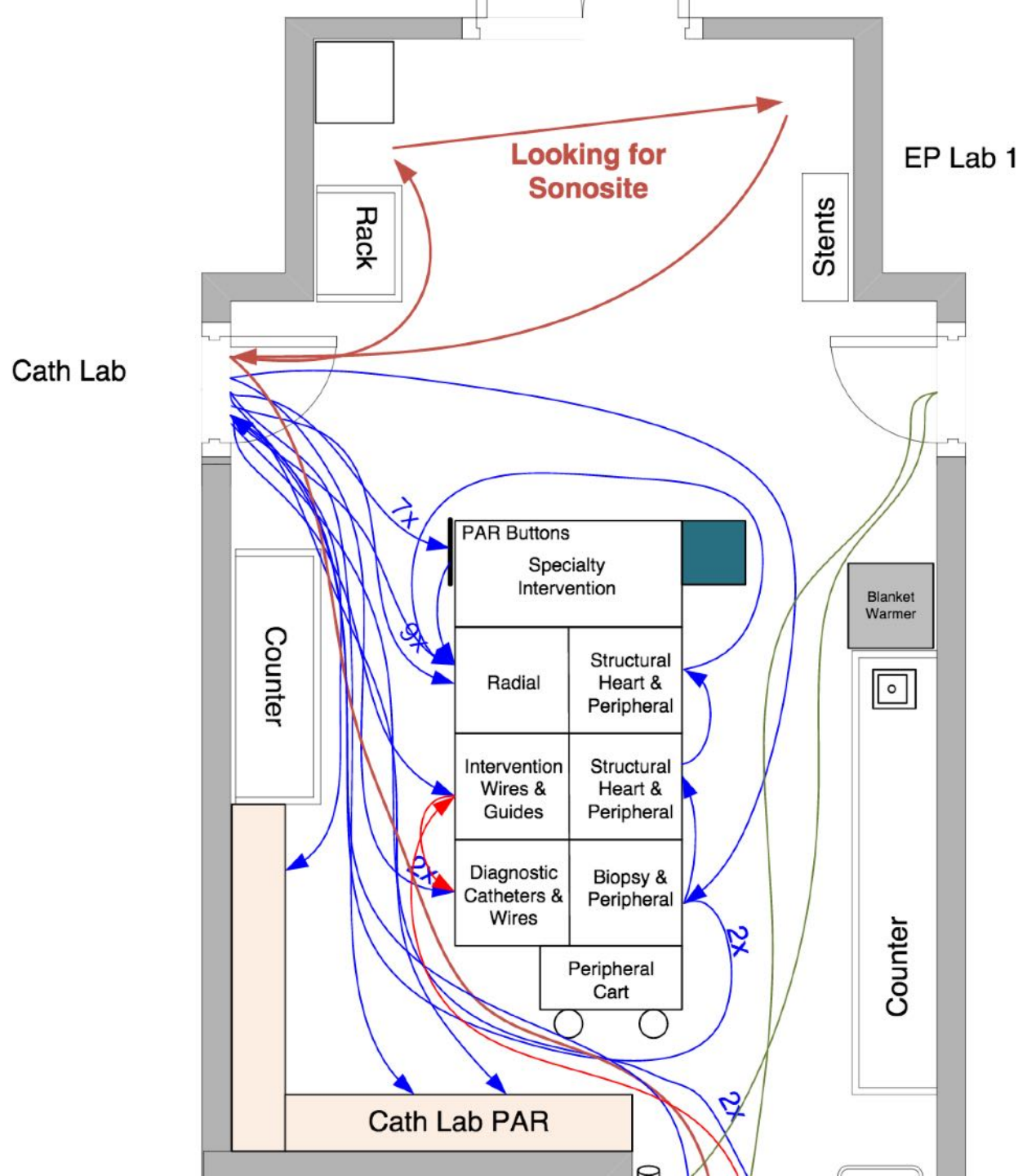1 Volunteer → Quality Assurance

1 Volunteer → Transport

1 Volunteer → Supplies

1 Volunteer → Transport Spaghetti Map (optional)

# Spaghetti Diagram

# ACTIVITY

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10 + 5 MIN

# Let's Talk about the Basics
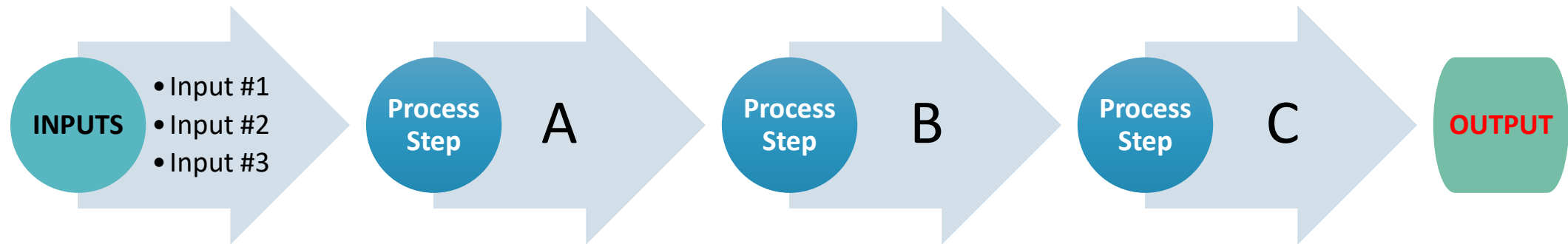
Process
Change Management
Data
Teams

# Guiding Principles for Quality Assurance

- Focus on **processes** to increase the productivity of work

- Focus on the needs of the **users**

- Use **data** to improve services

- Use **teams** to improve quality

- Improve **communication**

Process = A series of actions or steps taken in order to achieve a particular end

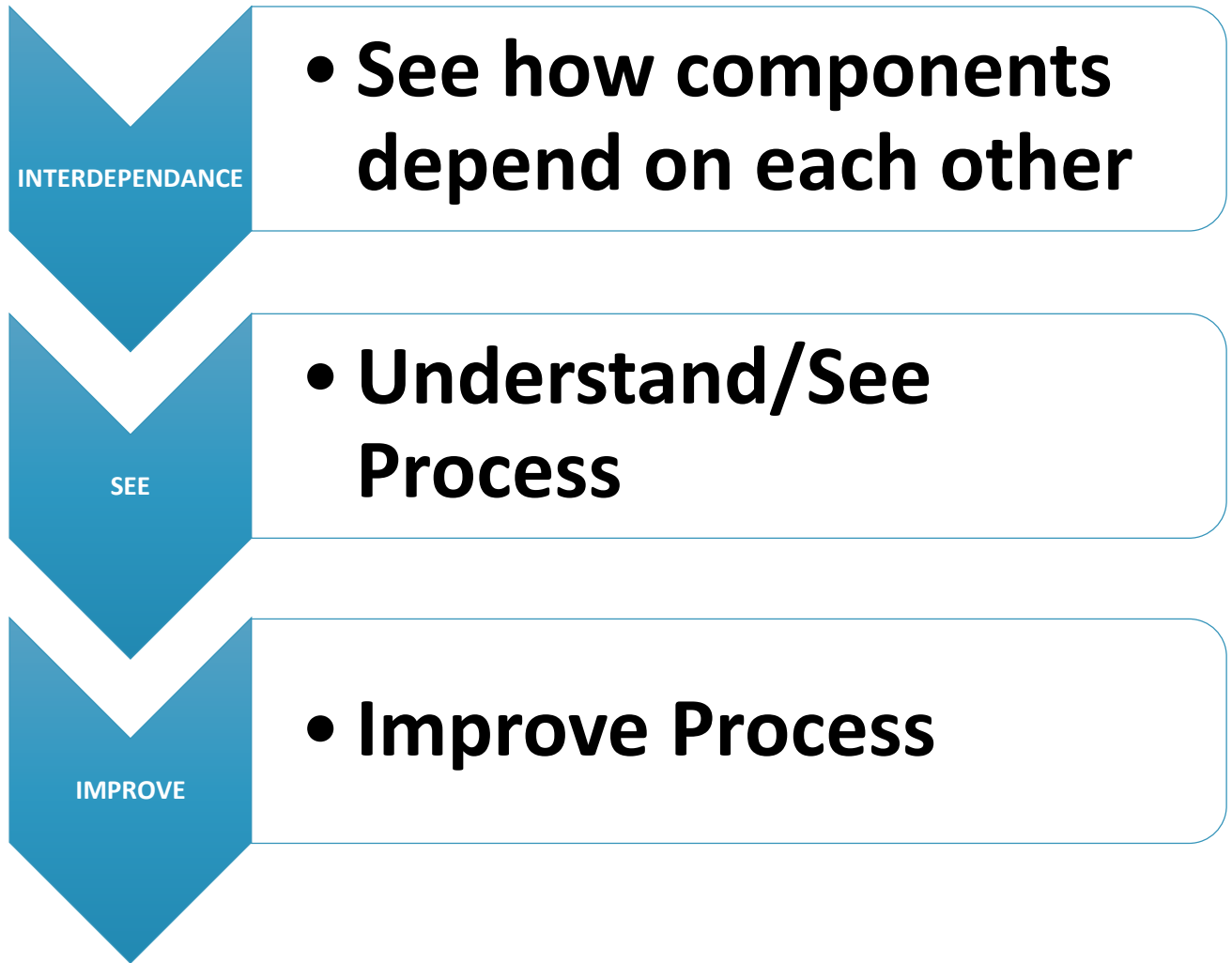# Process = Sequence of procedures to convert inputs into outputs

*"The first step in any organization is to draw a flow diagram (process map) to show how each component depends on others.  Then everyone may understand what their job is.  If people do not see the process, they cannot improve it."*

**W Edwards Deming**
**(1900-1993)**

# Why are processes important?

The way we do our work

**INTERDEPENDANCE**
- **See how components depend on each other**

**SEE**
- **Understand/See Process**

**IMPROVE**
- **Improve Process**

# ACTIVITY

**What you will need:**
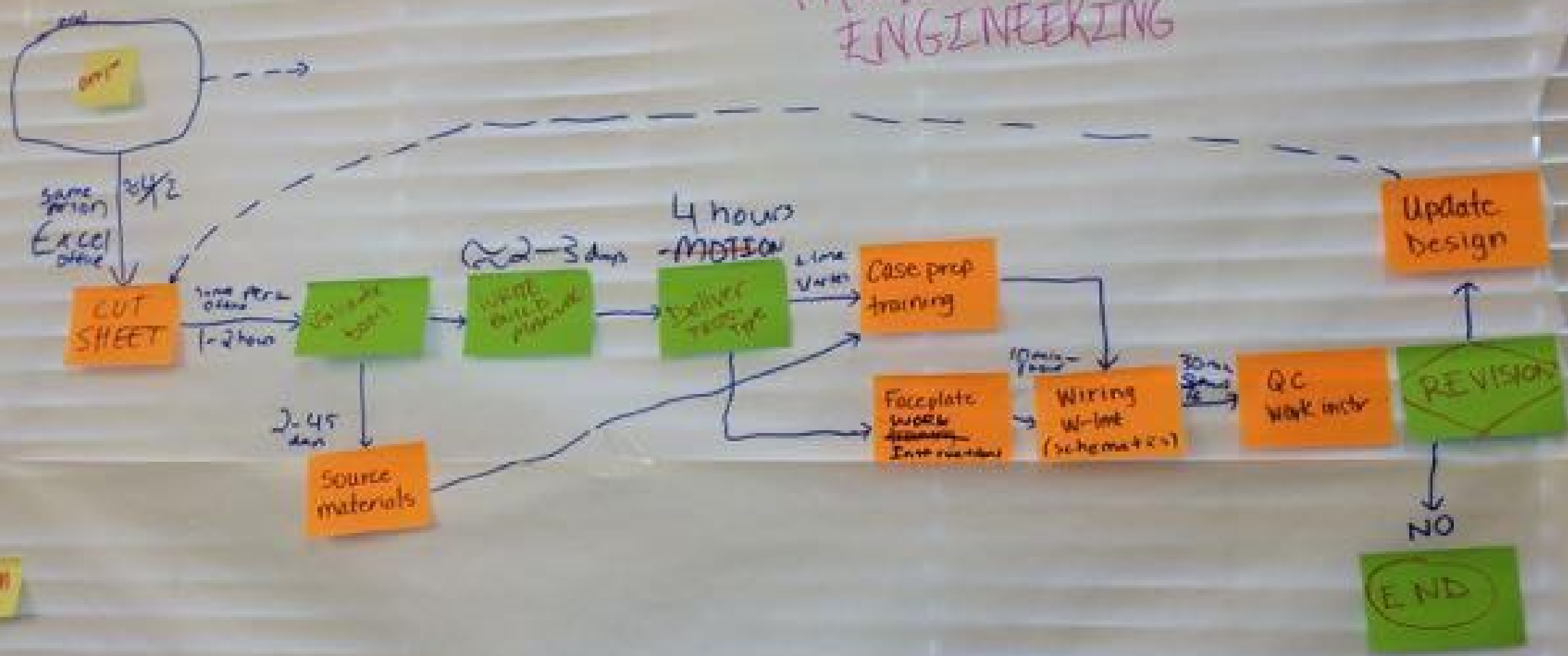
**Sticky Notes**

**Flip Chart Paper**

**Markers**

- Create a Process Map: <span style="color:red">Create a Process Map of the Emergency Room Activity that you just completed</span>

- Show all Steps - Use sticky notes for process steps

- Debrief with the group

**5 MIN**

PRODUCTION ENGINEERING

# ACTIVITY

**What you will need:**

**Sticky Notes**

**Flip Chart Paper**

**Markers**

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- Debrief with the group

5 MIN

# Process = Sequence of procedures to convert inputs into outputs (ED Simulation)
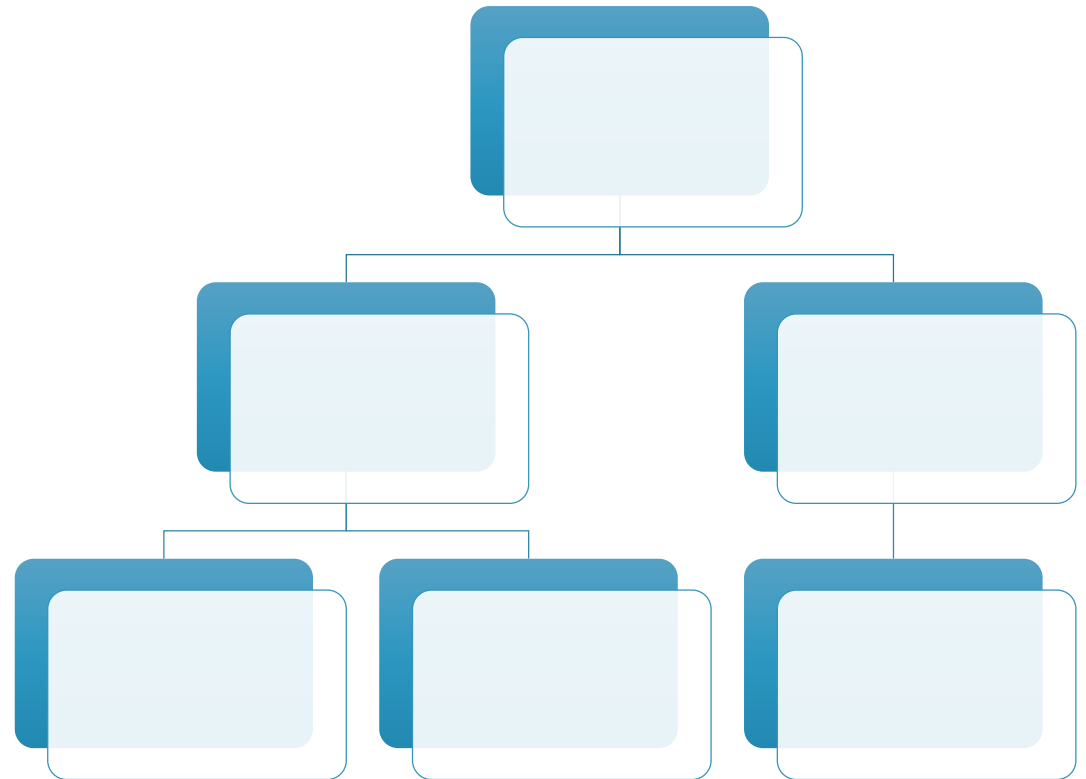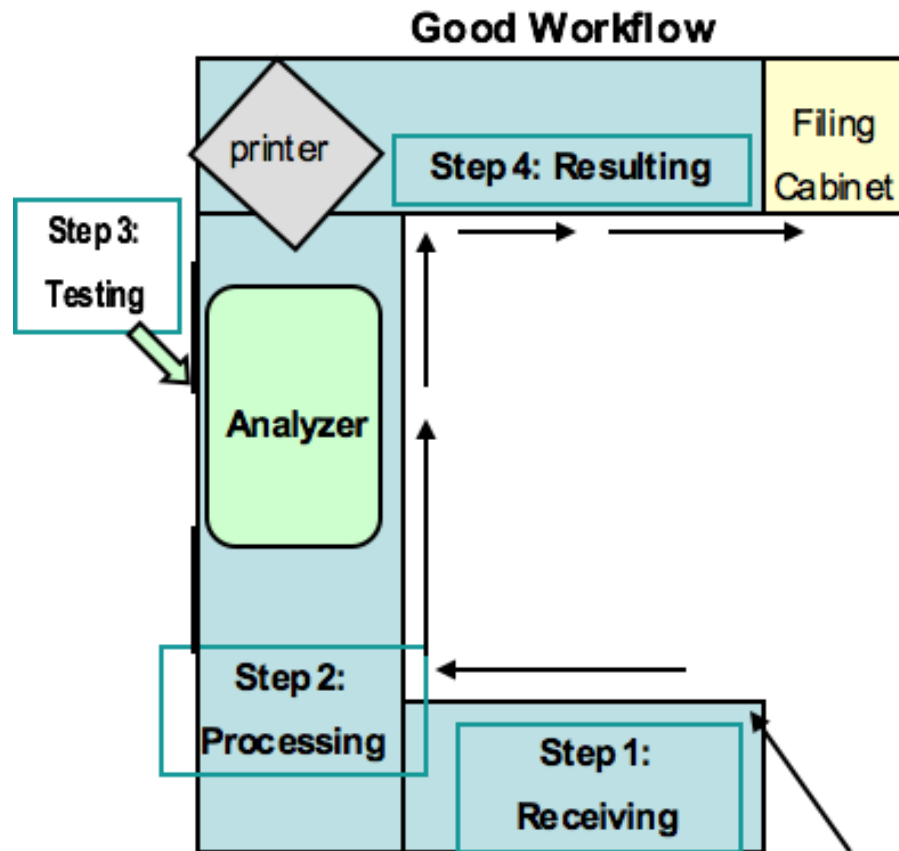
INPUTS
- Input #1
- Input #2
- Input #3

Process Step A

Process Step B

Process Step C

OUTPUT
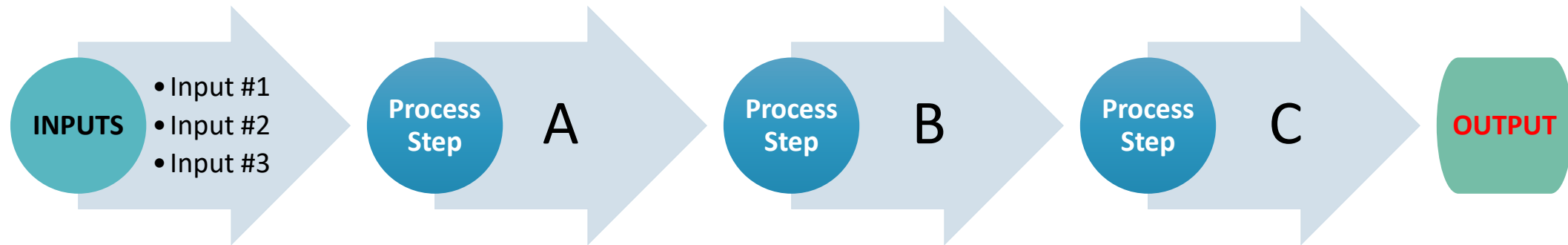
# P + S = O

**Process**

**Structure**

# Structure

**Physical Structure**



**Organization / Culture**
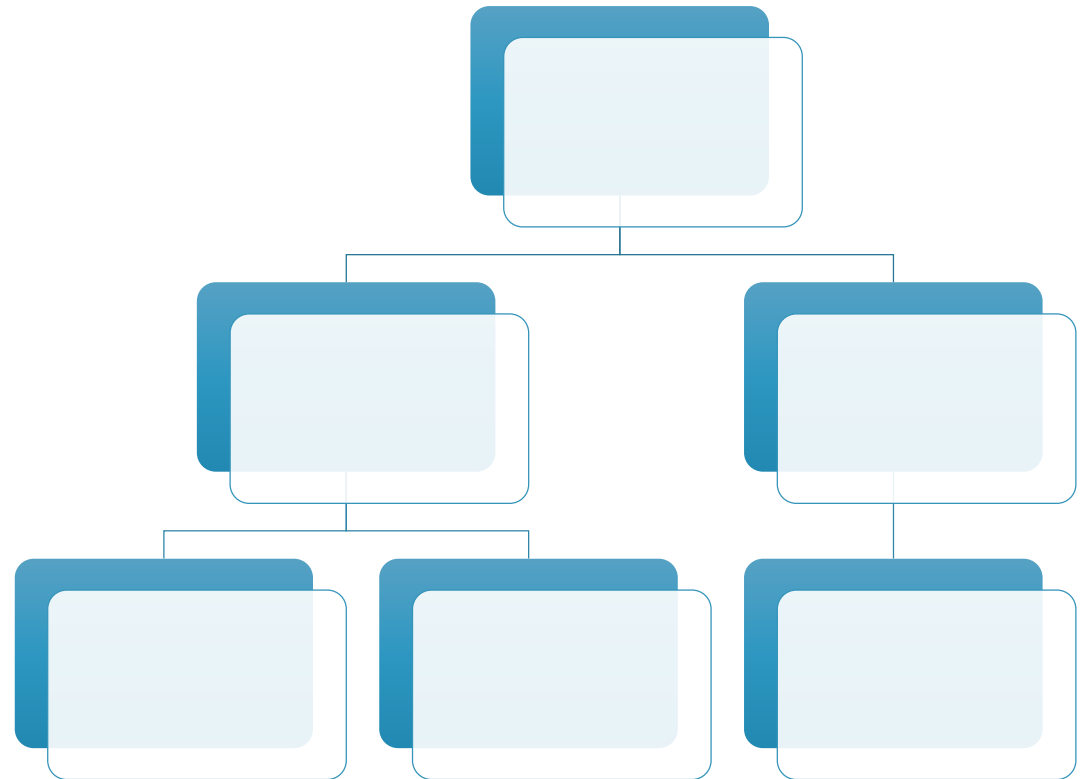
# Change Management

# Switch

"A compelling **vision** is critical. But it's not enough. The hardest part of change – the paralyzing part – is precisely in the **details**."

The Heath Brothers, *Switch*
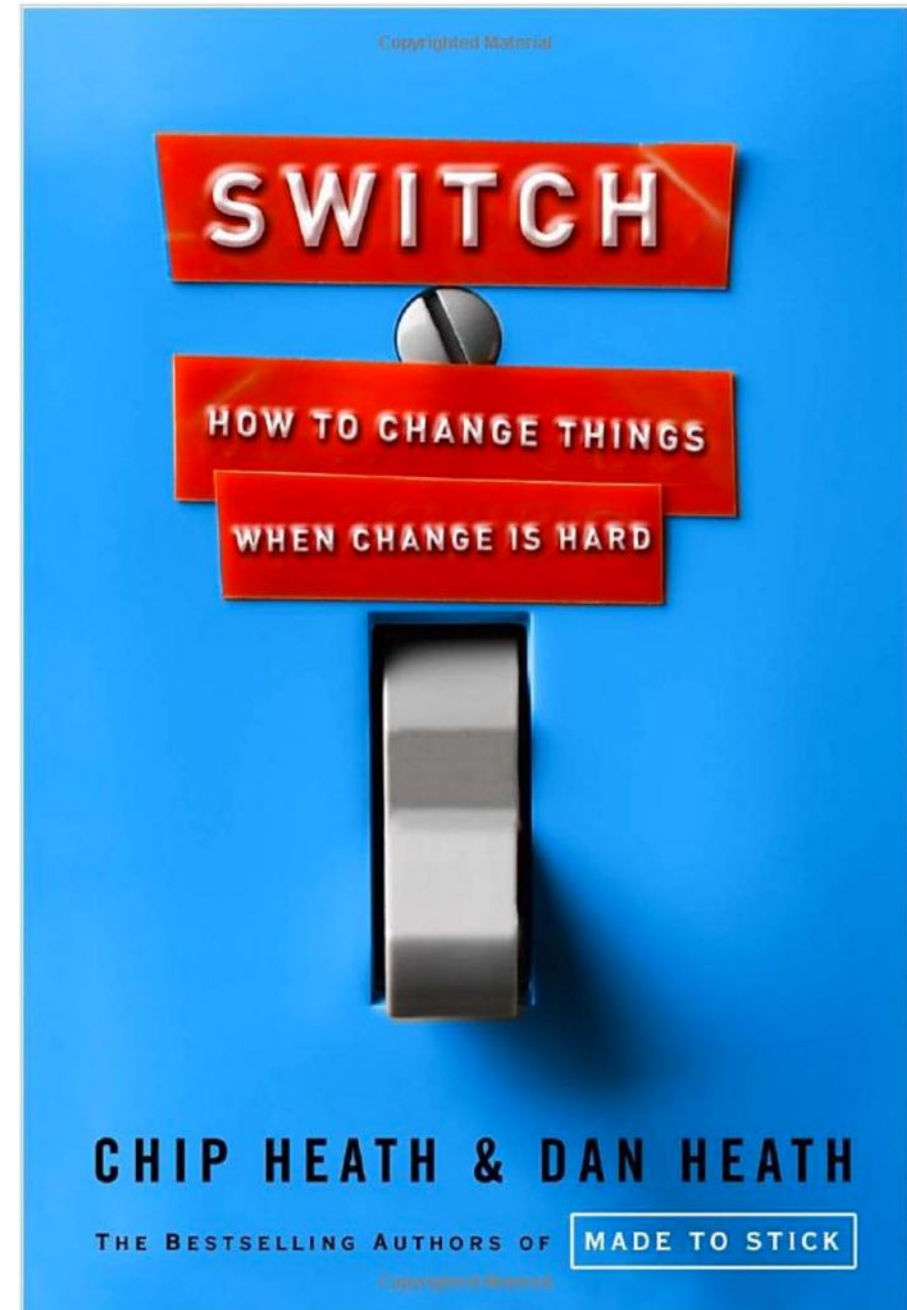
# Switch

- DIRECT the **Rider**
  - FOLLOW THE BRIGHT SPOTS.
  - SCRIPT THE CRITICAL MOVES.
  - POINT TO THE DESTINATION.
- MOTIVATE the **Elephant**
  - FIND THE FEELING.
  - SHRINK THE CHANGE.
  - GROW YOUR PEOPLE.
- SHAPE the **Path**
  - TWEAK THE ENVIRONMENT.
  - BUILD HABITS.
  - RALLY THE HERD.

# Switch

- Enter to win your own copy of <u>Switch</u>
- Submit one (1) paragraph that answers the following three questions:
  - In what situation is change management needed?
  - Why?
  - How will you use the information in the book to change things?
- Submit by 8 am tomorrow (Friday)
- Winner announced at noon on Friday
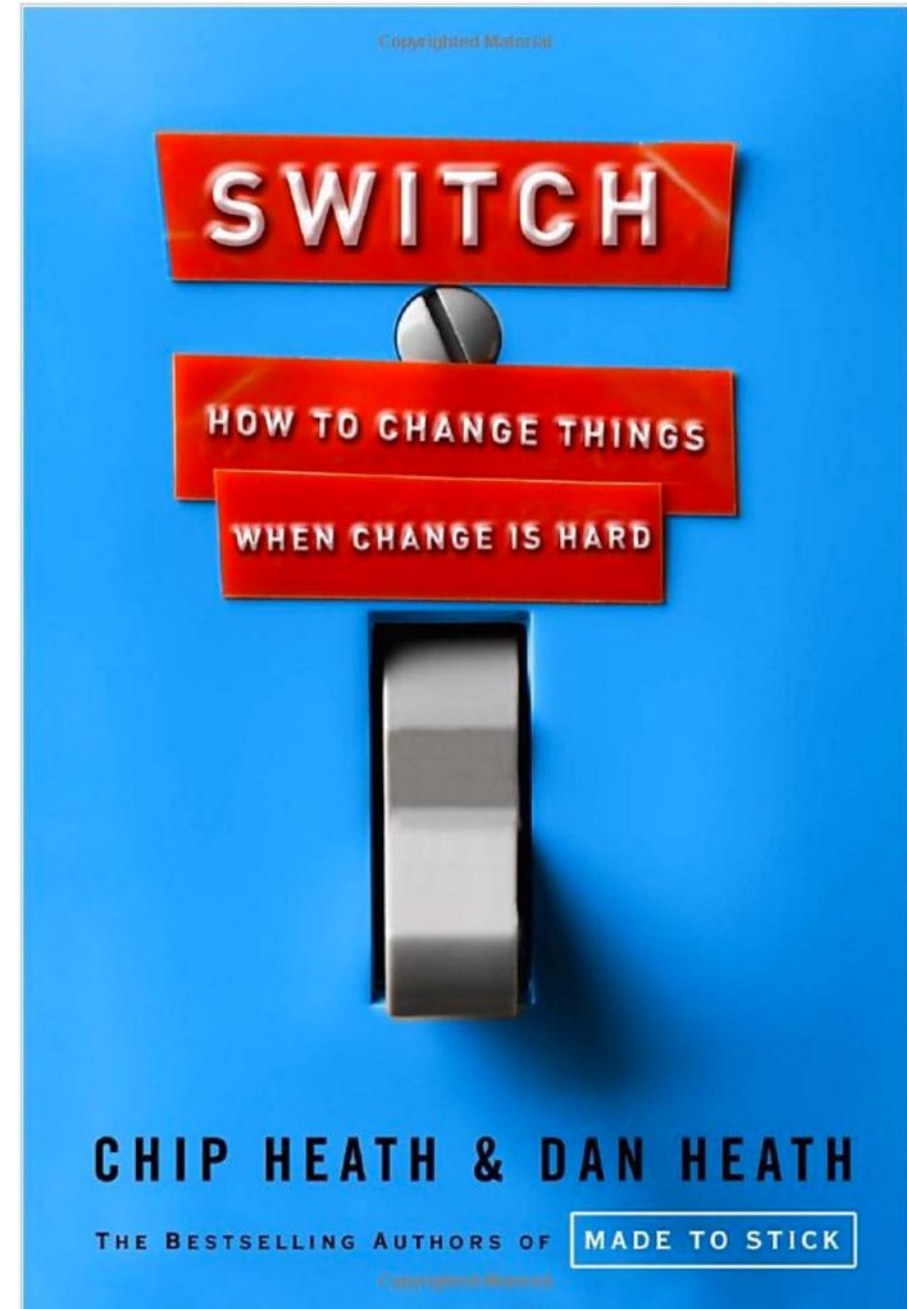
# Why Collect Data?

To establish a factual basis for making decisions

**"I think the problem is…"**

**VS**

**"The data indicates the problem is…"**

**Data Driven Decisions**

**VS**

**Opinion Drive decisions**

Which data?

# "Measure what matters"

# Ask 3 Questions – The Model for Improvement

**AIM** — What are you trying to accomplish?
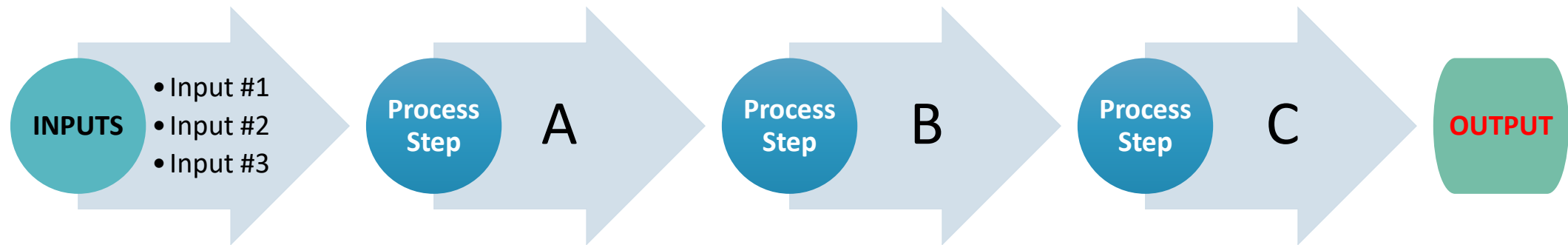
**METRIC** — How will you know if a change is an improvement?

**CHANGE** — What change will you make that will result in an improvement?

# Process = Sequence of procedures to convert inputs into outputs

**INPUTS**
- Input #1
- Input #2
- Input #3

**Process Step** A

**Process Step** B

**Process Step** C

**OUTPUT**

**Input Measures**

**Process Measures**

**Output /Outcome Measures**

# What are some things that you can measure?

- Time
- Defects (Errors)
- Scores – i.e., Customer Satisfaction
- Compliance
- Cost
- Time between episodes
- Counts - i.e., numbers of patients
- Percentages

# Where to find data?

- Data present currently, sources could include:
  - Data bases
  - Ongoing projects
  - Ministry of Health – Written log or electronic records
  - Partners/NGOs
- Data not present, must collect:
  - Data Collection Plan – Details
    - What / How / When / Who
  - Data Collection Log – Create & Modify

# Use your Data

- Be transparent – display data prominently

- Act on information

# Use your Data

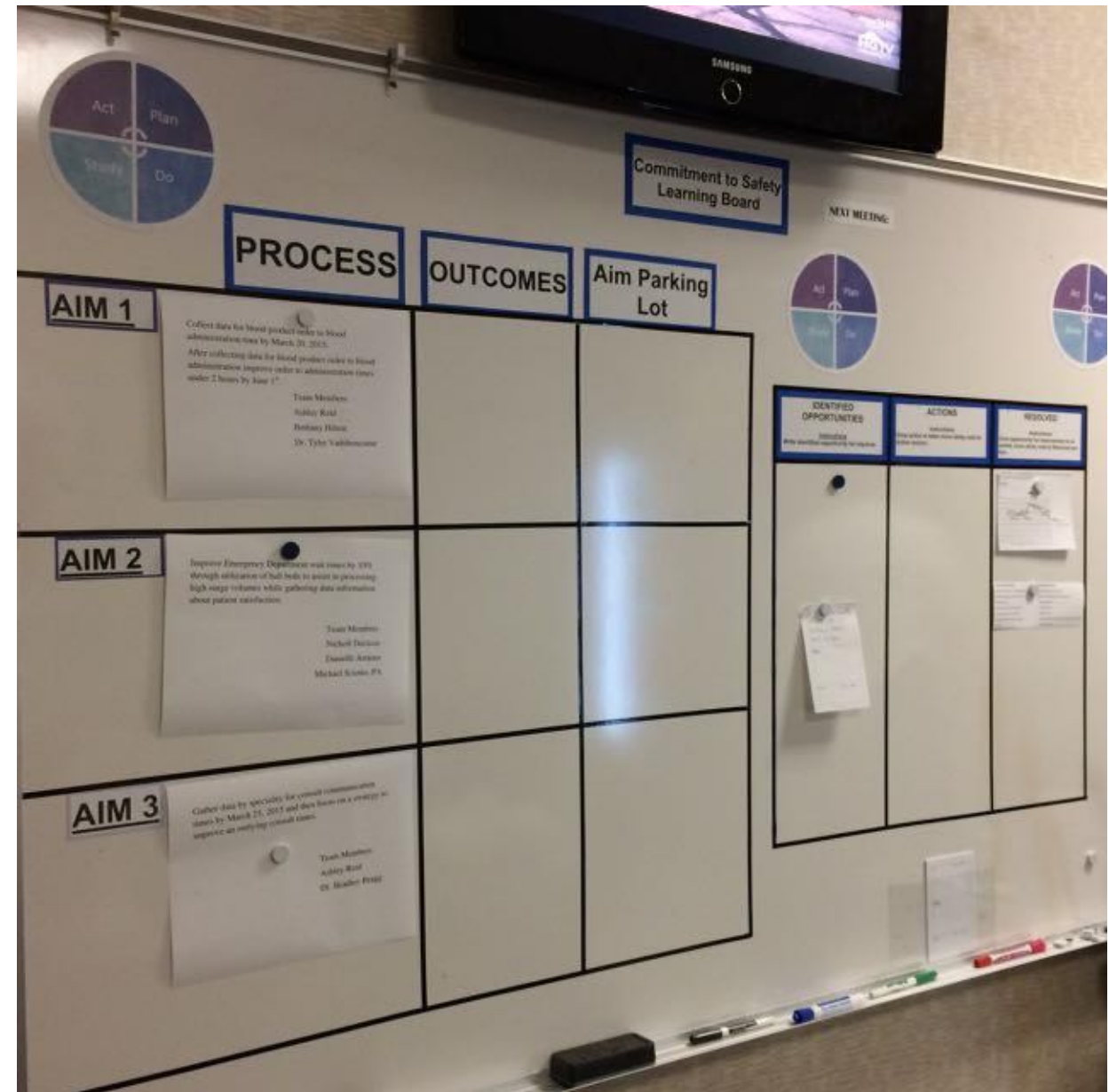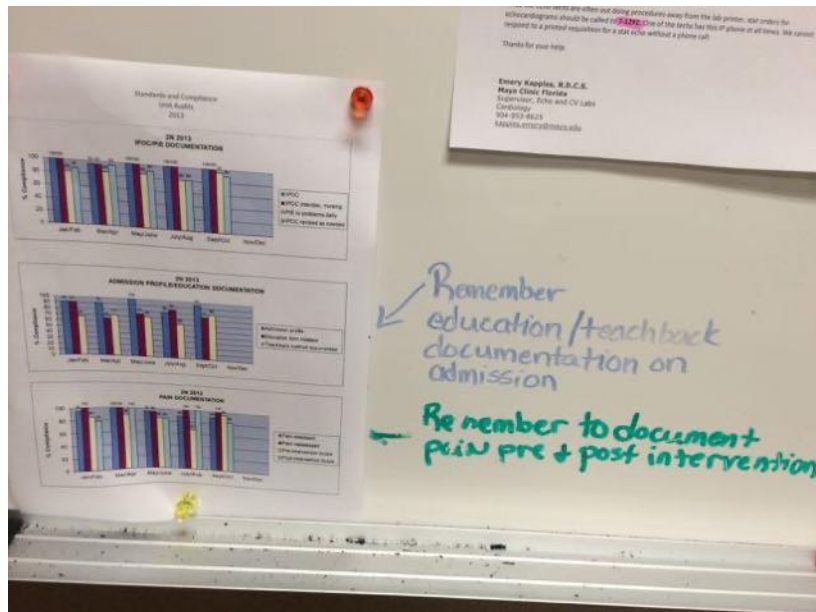- Be transparent – display data prominently
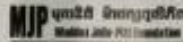
- Act on information

## Poster 1
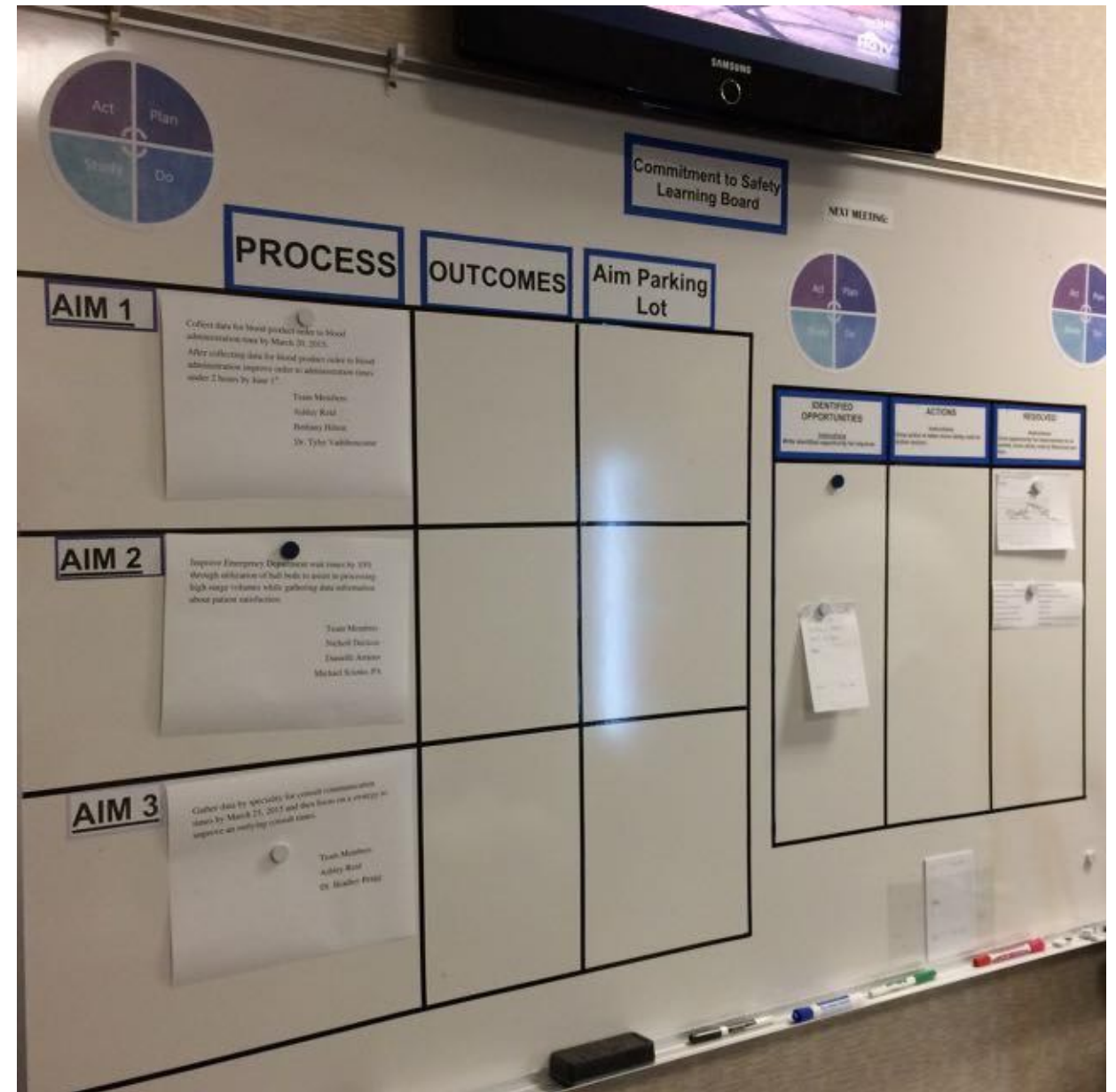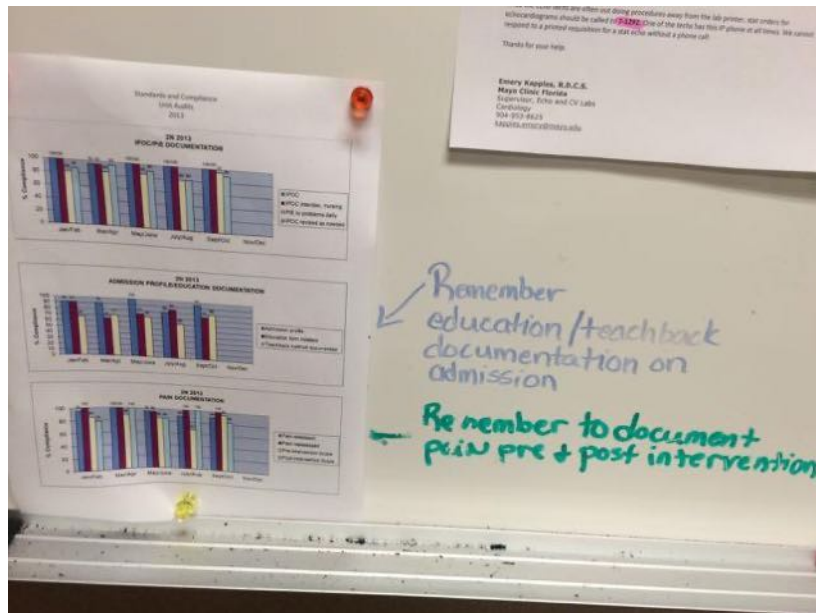
**NHS** — Thames Valley and Wessex Leadership Academy

**MJP** Maddox Jolie-Pitt Foundation

# Streamlining health metric collection to strengthen project monitoring and evaluation in an NGO setting

Barnett AG, Sisocheata C, Loeur C.

NHS Education South Central, UK & Maddox Jolie-Pitt Foundation, Cambodia

### Define

**Context**

The Maddox Jolie-Pitt Foundation (MJP) is a non-governmental organisation working in Battambang Province, Cambodia. MJP's health department runs numerous public health projects in the region. They collect numerous health metrics from various sources in their target area to facilitate project monitoring & evaluation (see fig. 1). The pre-intervention metric collection system was a time consuming burden on the MJP health department staff, reducing the time available for the provision of quality patient care and capacity building work with local health centre staff.

Fig. 1: sources of MJP data

**Aim**

Create a streamlined, automated data input and analysis system thereby improving efficiency and reducing errors.

**Interdisciplinary team**

NESC Improving Global Health fellow/physician (AG Barnett), MJP Health lead/physician (C Loeur), MJP health/midwife (C Sisocheata).

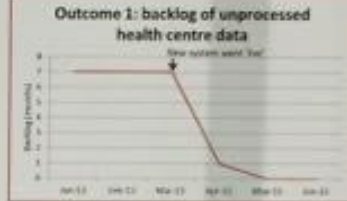### Outcome measures & targets

1  2  3  4

### Project design

We planned the project using MJP's logical framework tool: a matrix which breaks the project down into a series of goals, and promotes a structured approach toward reaching these goals. We continually re-evaluated the project throughout using an iterative process of recurrent SWOT analyses (Strengths Weaknesses Opportunities Threats). We used Microsoft Excel to automate as much of the data entry and analysis as possible. We used spreadsheet linking to improve data transfer between spreadsheets – making this process quicker and error-free. We added macros and formulae to the spreadsheets which automated analysis of the data to produce outcome metrics; again, improving efficiency and fidelity. Fig 2 illustrates the strategies used to improve each step of the analysis.

### Sustainability

The project involved long-term local MJP staff from its inception (C Sisocheata & C Loeur). Working together, we refined the new system in an iterative process to make it suitable for its intended end-users. MJP staff took over the running of the system for the final month of the project, allowing "troubleshooting" of any problems. This was a great success: the system is still in use today.

### Results to date

**Outcome 1: backlog of unprocessed health centre data**

**Outcome 2: time taken for staff to process one month's worth of data**

**Outcome 3: number of errors made during data processing**

As you can see from the above results, we met our targets for outcomes 1-3. We also converted all spreadsheets to bilingual English/Khmer versions and so met target 4 too.

### Lessons learned

This was a single intervention, but an effective one. We were able to save hours of staff time, and improve the reliability of the core health metrics that we use in evaluating our project. The key lesson from this project was that effective use of IT can be a tremendous help in repetitive tasks such as data entry and analysis. We did, however, have to accept a less-than-optimal system. One of our two regional health centres was unable to provide a spreadsheet in electronic form, as they did not have access to a computer. This is a salutary reminder that interventions must be appropriate to the resources which are available.

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## Poster 2

**Seattle Children's**

**UW Medicine** SCHOOL OF MEDICINE
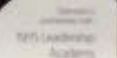
# Building a Better Emergency Department: Integrating Process and Design

Russell Migita, MD, Dawn Cotter, RN, MBA, Brianna Enriquez, MD, Kendra Powell, RN, Jenn Zanatta, RN, Rupinder Sandhu, RN, Elaine Beardsley, RN, MN, Joel Teal, MA, Yalda Nattie, Eileen Klein MD, MPH, Dena Brownstein, MD, Ashley Harrington, Lori Kapp, Emily Spice, George A. Woodward, MD, MBA

Seattle Children's Hospital

**Description:**

Lean principles were used to design an innovative, flexible, patient-centered Emergency Department (ED) with major design events spanning less than four months. In addition to standard 3P Lean facility design tools, process visioning and development workshops were used to integrate facility design and our ideal process.

**Aim Statement:**

Design a facility that supports a model where maximum wait time to room is less than 30 minutes for 80% of patients.

**Events By Design Phases:**

**7 Week In Model of Care Design Visioning**

**7 Ways Schematic Design**

- Each team used 7 ways exercise to develop a preferred schematic design. Two teams focused on the "care up front" model of care and two teams focused on the "care in the back" model of care.
- Each team identified the trade-offs of incorporating Urgent Care and Observation within the space. Each team also identified the preferred shelled location for future growth.

**Team Members:**

Patient Family Reps
Providers (Attendings, APRNs)
Registration
Radiology Staff
Information Technology Staff
Mental Health
Facilities
Residents/Fellows
Nursing Staff
Pharmacy Techs
Environmental Services
Security
Supply Chain
Process Improvement Consultants

**Lessons Learned:**

- Clearly developing concepts for patient flow and team functioning prior to architectural design leads to less rework and improved function.
- Full scale mockups make it easier to test room size, layout and adjacencies.
- Longitudinal involvement of front line staff and families improves functionality of final product (~1000 staff days for design, refinement, testing and training).
- Facility design can hardwire elimination of wasteful process steps (elimination of triage is facilitated by absence of triage rooms).
- Design of supply location and delivery takes as much effort as family design.
- Iteration is key at all steps in the process.

Travel distance for patients and staff decreased for most diagnoses despite increase in footprint by 300%.

**Final Design**

## Redesigning the Emergency Department to improve door-to-doc time and patient satisfaction

Hospital Geral de Pedreira OSS

ADMINISTRAÇÃO SÃOCAMILO

Carlos Augusto Dias, Emerson Giampietro, Amilcar Mocelin, Pérsis Magalhães, José Antônio Passos, Fátima Aparecida Baraldi, Rosângela Bova, Joaquim Storani Neto
HOSPITAL GERAL DE PEDREIRA OSS - São Paulo, SP, Brazil

### Context

The Hospital Geral de Pedreira (HGP) is a government funded, privately managed, medium-complexity general hospital in São Paulo, Brazil. In 2012, 267,868 patients (38.3% general internal medicine, 20.5% pediatrics, 19.6% orthopedics and trauma, 11% general surgery, 10.5% obstetrics and gynecology) received care at its emergency department (ED).

### Problem and analysis

The ED suffered with patient crowding, excessive door-to-physician evaluation times and long patient stays, leading to user dissatisfaction which was manifested as ED walkaways, complaints and sometimes aggressive behavior against the staff, causing low morale and demotivation among the medical and nursing teams.
Patient triage was ineffective, delaying recognition and care of high risk patients.
The emergency room was always busy, impairing care of the emergency cases. "Boarding" was a constant feature, with more than 60 patients waiting for a hospital bed at most times. Several interventions had been tried previously, with poor results.

### Aims

Improve identification of high risk patients and reduce door-to-physician time and patient length of stay.

### Interventions

A multidisciplinary group comprised of hospital management, physicians, nurses and architect elaborated an improvement plan that included structural reforms and changes in triage process and care flow. As the general internal medicine service was the main focus of the complaints, it was chosen to begin the redesign process.
The Manchester Triage System was replaced by the Emergency Severity Index (ESI). Nurses and physicians were educated on its usage.
Patient flow was redesigned, with definition of specific areas and processes for ESI 1, ESI 2 and ESI 3-5 patients, and for reevaluation of patients after imaging/laboratory exams or medication.
A specific space was created to receive ESI 1 patients. Care of this group of patients was assigned to a team of intensivist physicians.
Areas previously used for administrative functions were modified to receive boarded patients, liberating corridors and hallways and improving flow.

### Results

Presentation-to-physician evaluation time and patient length of stay in the ED were significantly reduced. ED walkaways and user complaints decreased significantly.

### Lessons learned

Multidisciplinary work can achieve significant improvements in care processes and user satisfaction in the ED, despite several previous failures.

www.pedreira.org.br

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## Emergency Department: Door to Provider in less than 15 minutes
## Model of Care Redesign

Seattle Children's
HOSPITAL · RESEARCH · FOUNDATION

UW Medicine
SCHOOL OF MEDICINE

Russell Migita, MD, Dawn Cotter, RN, MBA, Brianna Enriquez, MD, Kendra Powell, RN, Jenni Zanatta, RN, Ruzinder Sandhu, RN, Elaine Beardsley, RN, MN, Joell Teal, MA, Yalda Nettles, Eileen Klein MD, MPH, Dena Brownstein, MD, Ashley Harrington, Lori Kapp, Emily Sipos, George A. Woodward, MD, MBA

Seattle Children's Hospital

# Teams

# Quiz – Quality Improvement Teams

1. Ideal number of members for a team?
2. Which members/roles should be part of the team?
3. What guidelines should the team have?
4. For how long should the team continue to work together?
5. How often should the team meet?

# Team Job Descriptions

- Champion/Sponsor
- Team Leader
- Content Expert
- Data Manager
- QI Expert/Coach
- Front Line Team Member – Each Cadre
- Manager of Front Line Team Member

# Teams

This project is designed to improve the care for our HF patients, specifically to:

- Reduce 30-day readmissions without adversely affecting length of stay (LOS)

- Reduce cost

- Reduce mortality

# ACTIVITY

**What you will need:**

**Quality Improvement Project Outline**

**Pens**

- Complete the "Team" Section of the "Quality Improvement Project Outline": Identify your team

- Identify the roles / responsibilities /names of each team member

- Report your results to the Group / Debrief

**7 MIN**

# Tools - Overarching

# LEAN

**Eliminate Waste**

# Types of Waste – MR TIM WOOD

| **M**is-utilization of skills | **R**e-prioritization | |
|---|---|---|
| **T**ransportation/ Material Movement | **I**nventories | **M**otions (movement) |
| **W**aiting | **O**ver-production | **O**ver-processing | **D**efects |

# ACTIVITY

**What you will need:**

**Sticky Notes**

**Markers**

- Conduct a "Waste Walk": Identify the Waste in the ER Exercise

- Using the 9 categories of waste as a guide, write (sticky notes) the specific episodes of waste that you experienced during the ER exercise

- Place on flip chart - under appropriate categories

- Debrief with the Group

7 MIN

# Lean Simplified

- Streamline the Value Stream (Work Flows & Layouts)
- Workplace organization (5S)
- Predictability & Consistency (Quality) – e.g. Mistake Proofing
- Visual Workplace
- Continuous Improvement (PDCA)
- Pull versus Push

# Value

Define value in your process through the eyes of the patient

# P + S = O

**Process Flow**

**Layout**



Good Workflow
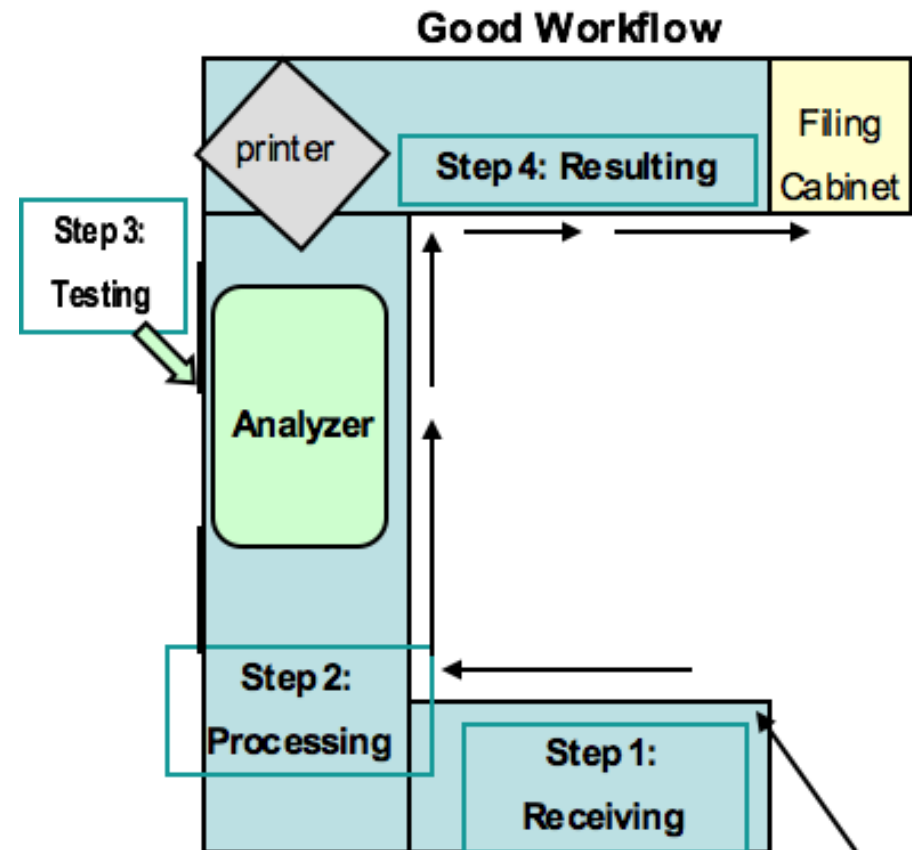
# Value Added Ratio

$$= \frac{\text{Process Time (Value Added)}}{\text{Total Time}}$$
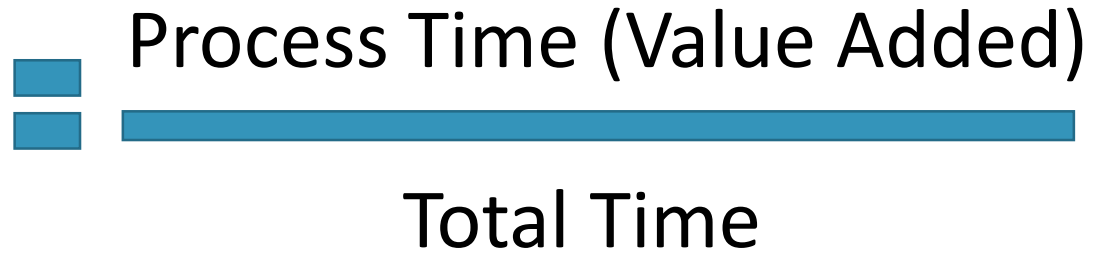
# Process Map – Future State

# Process Maps

**Current State**
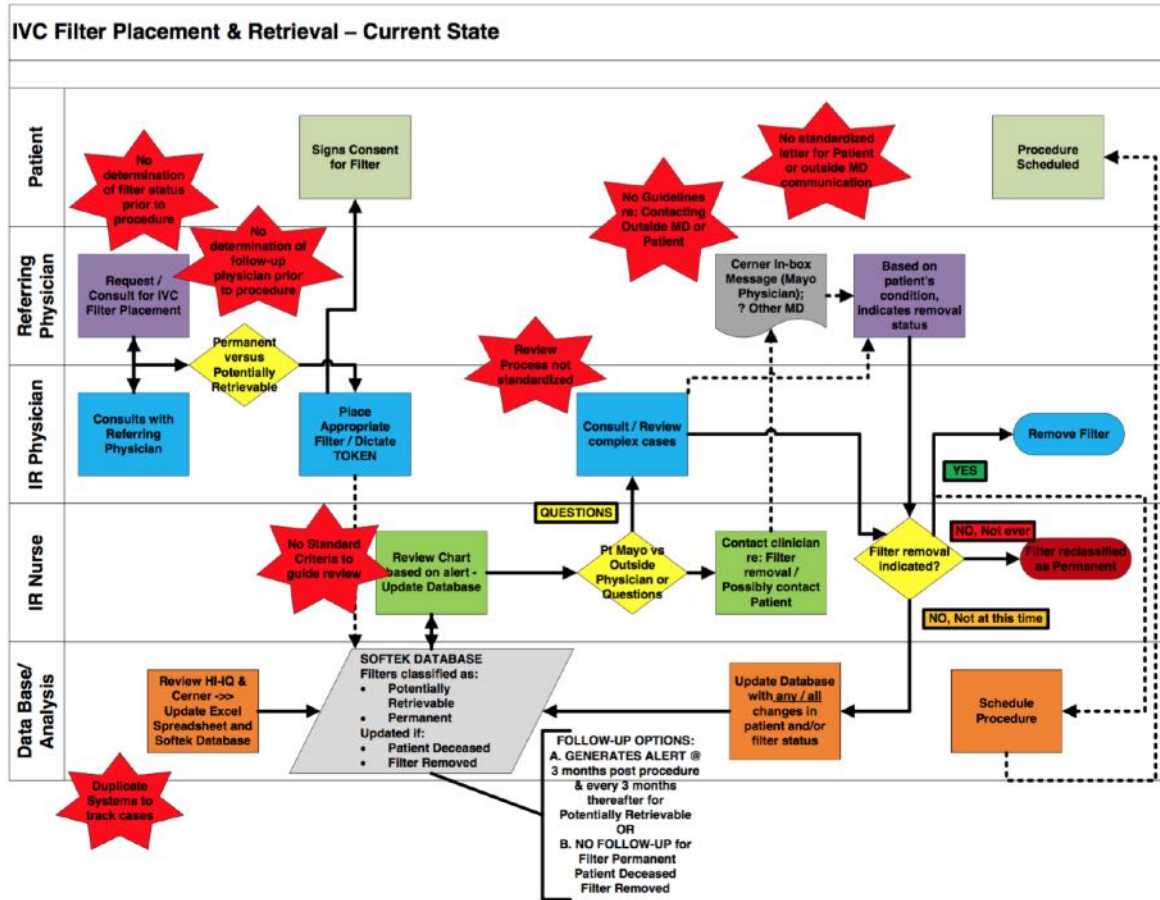
**Future State**
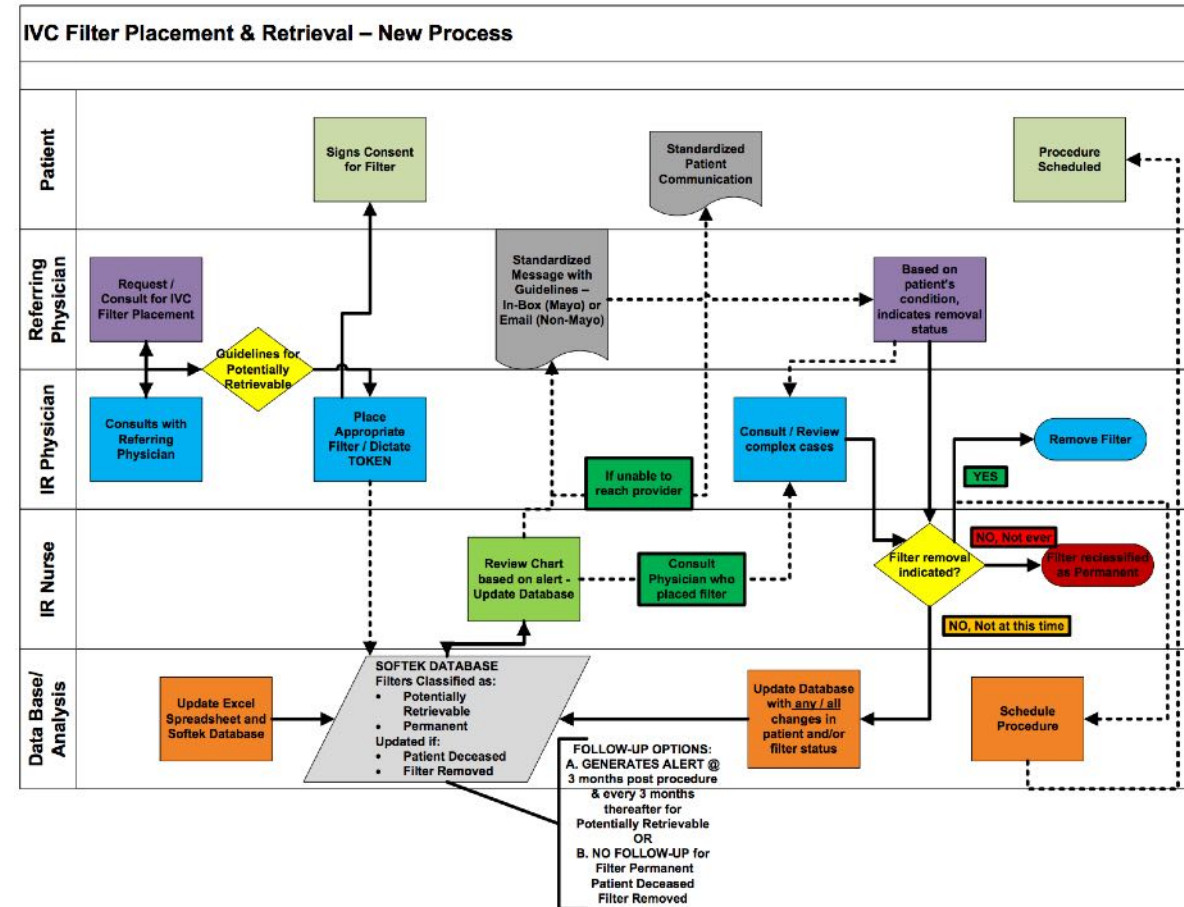
# Moving from Current State to Future State

- **Eliminate** unnecessary steps
- **Combine** steps when practical
- **Re-arrange** steps for a better sequence
- **Simplify** necessary steps
- Work out your ideas with **others**
- Create a **new** (future state) process map

# LEAN - 5S Exercise

If you are here…

But you want to be here…

# 5S is the tool for you!

**Before**
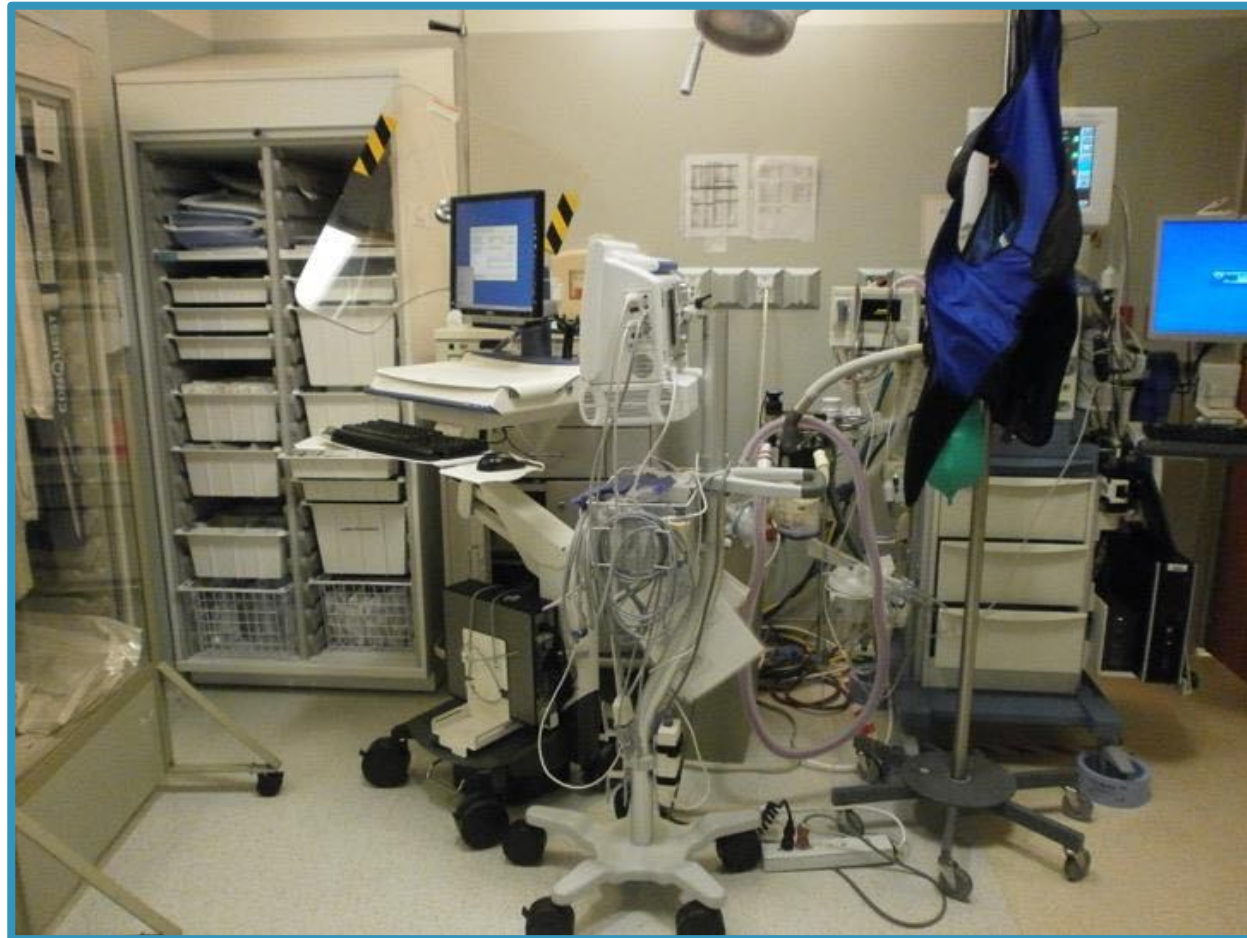
**After**

# 5S

**Sort** — Needed items from the un-needed

**Set In Order** — Efficient access and identification

**Shine** — Area is clean and everything is maintained

**Standardize** — Consistent guidelines, visual indicators

**Sustain** — Education, communication, and continual improvement. Until it becomes a habit!

# 5S: Before and After Pictures

**Before**     **After**     **Before**     **After**
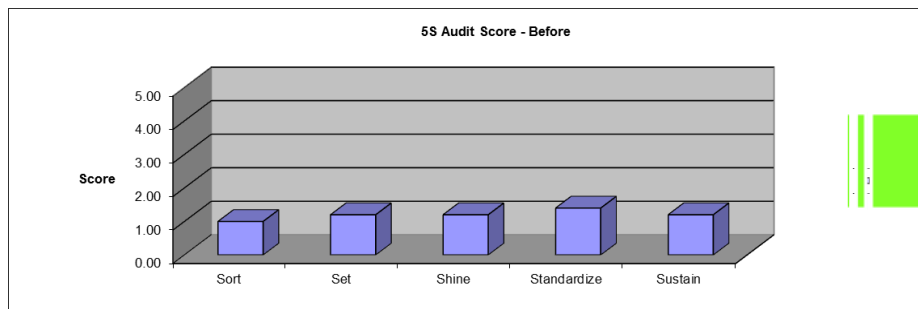


**Before**
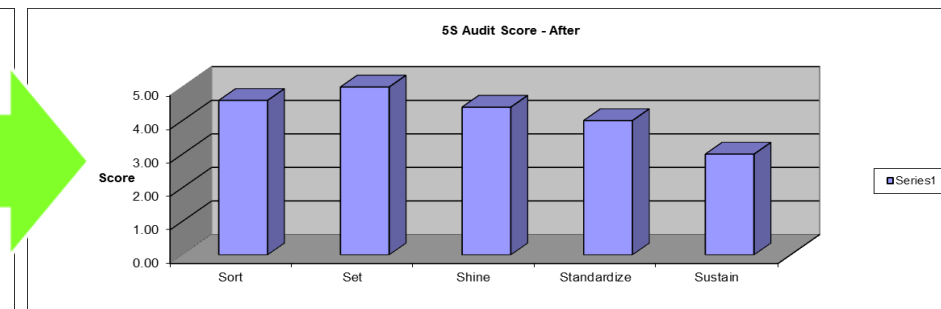


**After**

# Measure
# Measure
# Measure

## 5S Audit Sheet

Area:_____.          **5S Level of Excellence Audit Sheet**          Date:_____.

| Level | Sort | Identify & eliminate what is not needed | Level of Excellence 1 2 3 4 5 | Comments |
|---|---|---|---|---|
| 1 | | Necessary and unnecessary items are mixed together in the work area | | |
| 2 | | Necessary and unnecessary items are separated (boxes, supplies, equipment) | | |
| 3 | | All unnecessary items have been removed from the work area (no broken items) | | |
| 4 | | Documented method to maintain work area free of unnecessary items. | | |
| 5 | | Unnecessary items are immediately visible and triggers a planned response with root cause analysis and corrective action demonstrated over at least 3 months. | | |

| Level | Set in Order | A place for everything and everything in its place | Level of Excellence 1 2 3 4 5 | Comments |
|---|---|---|---|---|
| 1 | | Equipment room shows no sign of organization. Items are randomly located. | | |
| 2 | | Designated location established for all items as needed. | | |
| 3 | | Visual Controls are in place so that items that are missing or out of place are immediately noticed (Task Board, color, outlines, labels, numbers, etc). Visuals make items' "home" location obvious. | | |
| 4 | | Documented method of visual sweep to identify items out of place or exceeding quantity limits. | | |
| 5 | | Items are either in use or in their designated location at all times, demonstrated over 3 months or more. | | |

| Level | Shine | An effective, organized environment | Level of Excellence 1 2 3 4 5 | Comments |
|---|---|---|---|---|
| 1 | | Supplies and equipment are dirty and/or disorganized. | | |
| 2 | | Equipment room is cleaned on a regularly scheduled basis. | | |
| 3 | | Visual Controls are in place. Room is cleaned daily. Procedures are in place to communicate improvement ideas and maintenance needs. | | |
| 4 | | Equipment and supplies are obviously clean. Can see evidence that Improvement Ideas and Maintenance tasks are followed up on in a timely manner. | | |
| 5 | | Abnormal is immediately visible and triggers a planned response with root cause analysis and corrective action, demonstrated over 3 months or more. | | |

| Level | Standardize | Develop standards and stick to them | Level of Excellence 1 2 3 4 5 | Comments |
|---|---|---|---|---|
| 1 | | No attempt is being made to document or improve current processes. | | |
| 2 | | Current process is known, but not documented. | | |
| 3 | | Current state is documented as Standard Work performed the same by all employees. | | |
| 4 | | Future state is documented. Implementation plan is actively worked. Area metrics are linked to company metrics and are clearly displayed. | | |
| 5 | | Improvements are based on data and tracked for actual results, demonstrated over 3 months or more. | | |

| Level | Sustain | 5S is a way of life | Level of Excellence 1 2 3 4 5 | Comments |
|---|---|---|---|---|
| 1 | | Minimal attention is spent on 5S. | | |
| 2 | | 5S is a scheduled event. | | |
| 3 | | 5S practices are evaluated on a regular basis. | | |
| 4 | | Documented methods have been put into place to ensure adherence to 5S. Current/historical 5S levels are posted. | | |
| 5 | | Employees continually seek improvement opportunities, and the significant level of engagement is visible to outsiders. Exceptional 5S levels in other categories have been sustained for 3 months or more. | | |

**AREA FOCAL'S NAME:**_____          **TOTAL 5S LEVEL:**_____

File: _5S_Audit.xls          5S Facilitator Handout 17          2/14/2013

**CABINET 2**

| SYRINGES | |
|---|---|
| 1 ml | STERILE BOWL |
| 3 ml | GAUZE SPONGES |
| 5 ml | |
| 10 ml | BETADINE |
| 20 ml | HYDROGEN PEROXIDE |
| 30 ml | ALCOHOL |
| 60 ml Catheter tip | SALINE FLUSH |
| 60 ml Luerlock | |

Labels on bins:
- ...E FLUSH
- 5 ml SYRINGE
- 3 ml SYRINGE
- 1 ml SYRINGE
- ...GE
- 30 ml SYRINGE
- 20 ml SYRINGE

# LEAN - Visual Management

# Making quality/safety /efficiency visible & therefore, easy to do!

QC
COMPLETE

BEGIN
STAINING

# LEAN - PDCA
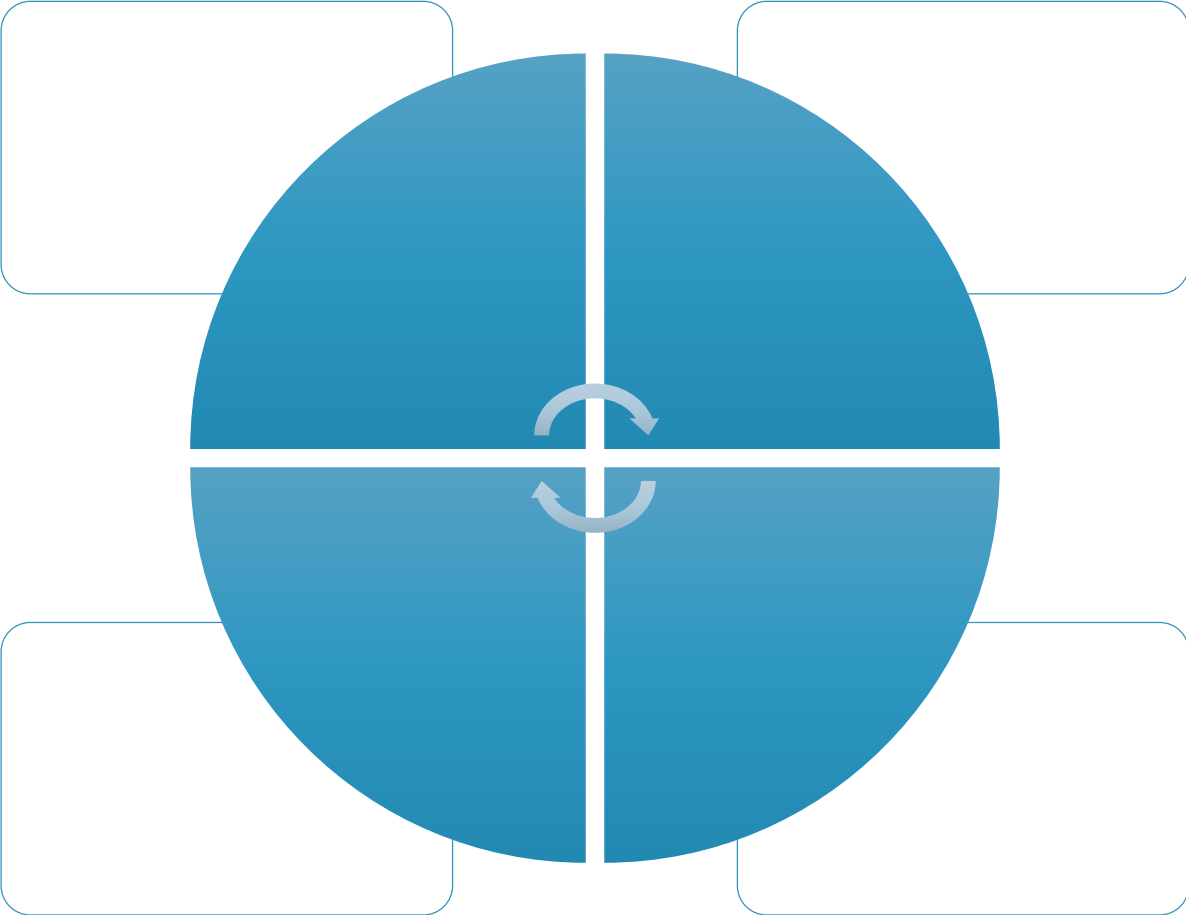
# Lean Simplified

- Streamline the Value Stream (Work Flows & Layouts)
- Workplace organization (5S)
- Predictability & Consistency (Quality) – e.g. Mistake Proofing
- Visual Workplace
- Continuous Improvement (PDCA)
- Pull vs Push

# Six Sigma

## Reduce Variability

## Decrease Defects



**Control Chart**

Upper Control Limit

Mean

Lower Control Limit

Sample #
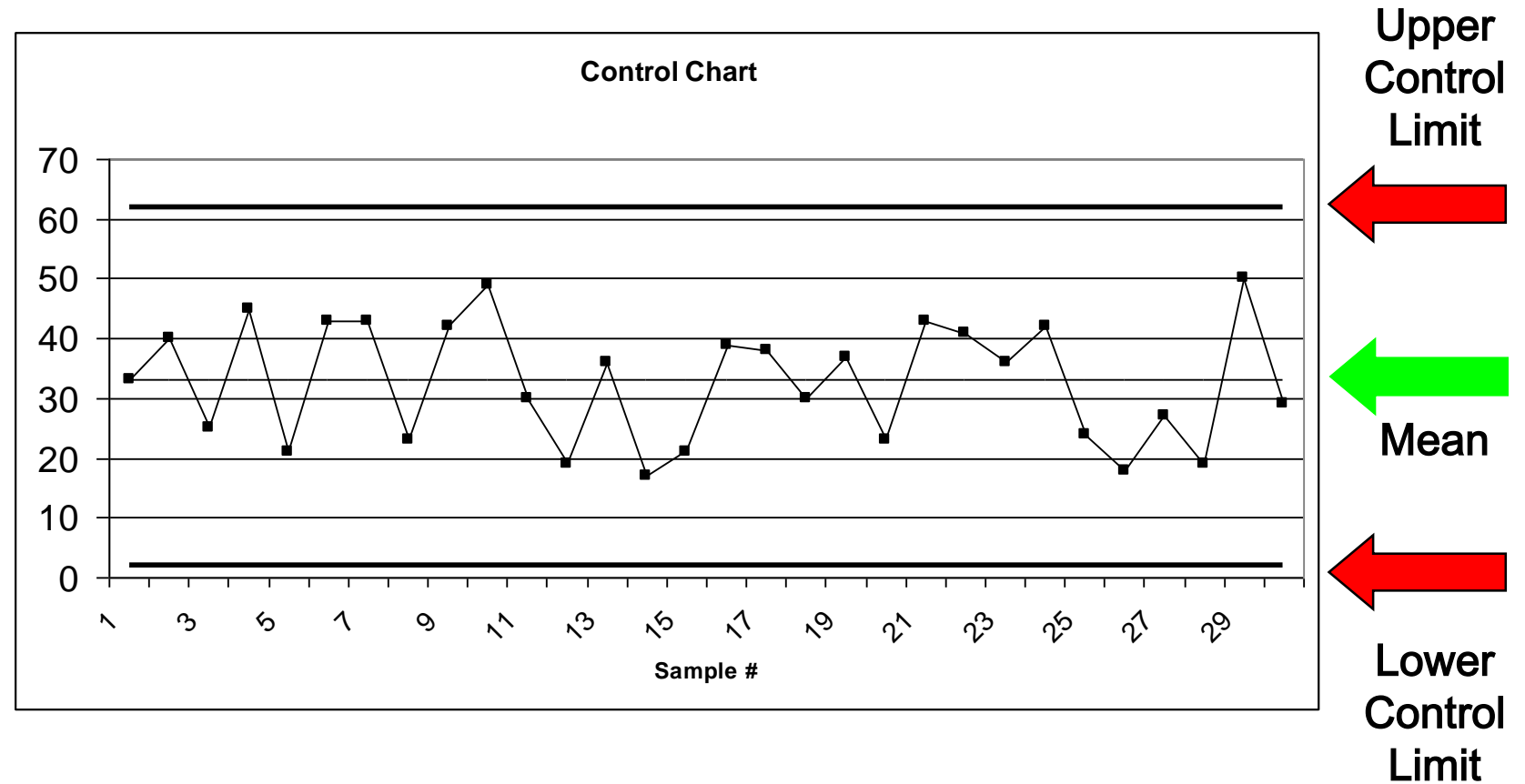
# DMAIC – Step by Step

Practical Tools for the Quality Ninja to Complete a QI Project

# Quality Improvement (QI) Approach
## DMAIC Framework: To Improve Any Process

**Define** → **Measure** → **Analyze** → **Improve** → **Control**

**Define**
Nature of the problem?
Goals / Aims
Timeline
Scope

**Measure**
Magnitude of the problem? Select metric to show improvement

**Analyze**
What are the most important causes of the problem?

**Improve**
What change will we make to address the causes of the problem?

**Control**
How can we sustain & spread the improvements?
Communicate success

# Project Overview – Collaborative Model
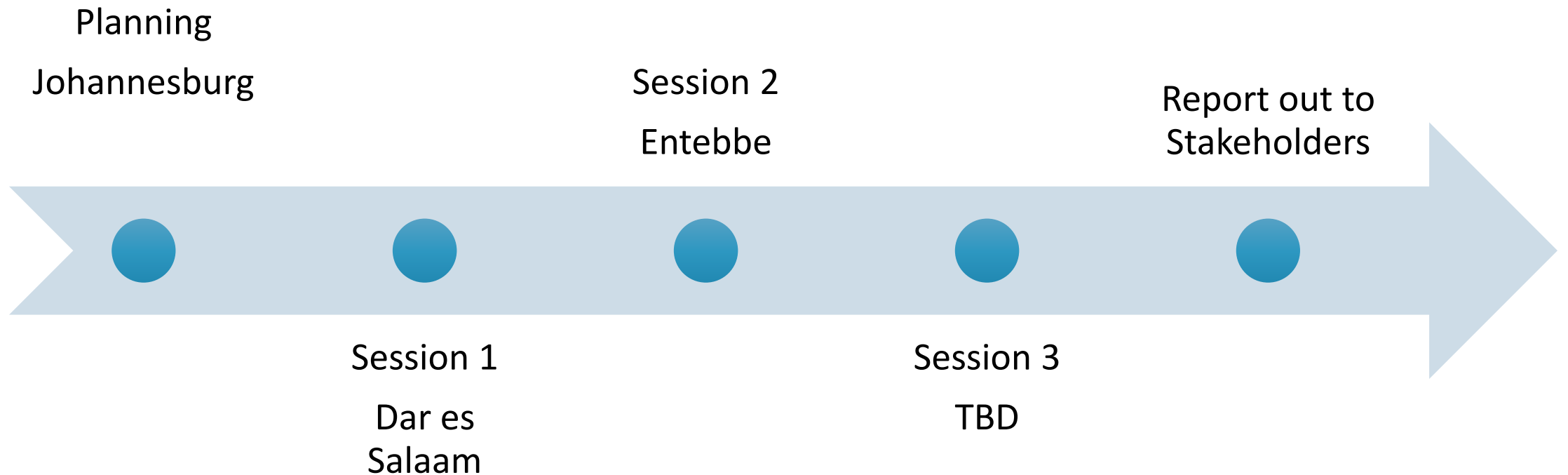
# Project Checklist

## Session 1 Deliverables
### DEFINE / MEASURE

- ❑ Identify Stakeholders
- ❑ Map the Process (Current State)
- ❑ Identify / Prioritize Opportunities
- ❑ Action Plan
- ❑ Project Outline
- ❑ Baseline Metrics / Data Collection Plan
- ❑ VOC Information
- ❑ Elevator Speech
- ❑ Communication Plan
- ❑ 1 Rapid/Small Test of Change (PDSA)
- ❑ Presentation

## Session 2 Deliverables
### ANALYZE / IMPROVE

- ❑ Root Cause Analysis
  - ❑ Fishbone Diagram, 5 Whys, or Pareto Chart
- ❑ Update Project Outline, if necessary
- ❑ 1 Rapid/Small Test of Change (PDSA)
- ❑ 1 5S Exercise
- ❑ 1 Visual Management Application
- ❑ Create Future State Map (if ready)
- ❑ Presentation

## Session 3 Deliverables
### CONTROL

- ❑ Update Project Outline, if necessary
- ❑ Validate Solution(s) / Interventions
- ❑ Modify Solution(s) where necessary by additional Test of Change (PDSA)
- ❑ Create Control Plan
- ❑ Transfer to Operational Owner
- ❑ Share/Spread Intervention, if applicable
- ❑ Final Presentation

# Project Pitfalls

- Process Maps
  - No process maps
  - Confusion between process maps & action plans
- Aim Statements / Metrics
  - Aim statement and metric do not match, not updated or do not reflect your goals
  - Metrics inappropriate for goals or not adequately defined
  - Goals of 100% unrealistic
  - Aim statement includes or suggests solutions

- Interventions
  - PDSA for interventions, not for data collection
  - Unclear interventions
  - Mixing 'Just do it' with your project intervention
- No results yet, so no run charts
- Project Management
  - Team does not schedule time to meet or members do not show
  - Monitoring data too infrequently (Quarterly)
- Fishbone – for RCA, not intervention
- Way forward vague

## Session 1 Deliverables
## DEFINE / MEASURE

- Identify Stakeholders
- Map the Process
- Identify /Prioritize Opportunities
- Action Plan
- Project Outline – 3 Questions & Aim Statement

- Baseline Metrics / Data Collection Plan
- VOC Information
- Elevator Speech
- Communication Plan
- 1 Rapid/Small Test of Change (PDSA)
- Presentation

# DMAIC

## Project Outline

## Project Outline

| THE THREE QUESTIONS | DEVELOP | YOUR ANSWERS |
|---|---|---|
| What are you trying to accomplish? | AIM | |
| How will you know if a change is an improvement? | METRIC | |
| What change will you make that will result in an improvement? | CHANGE | |

## DMAIC

| PHASE | KEY COMPONENTS | PROJECT DETAILS |
|---|---|---|
| Define | Gap:<br><br>Aim with Timeline: | |
| Measure | Baseline Measure:<br><br>Data Source:<br><br>Sample Size: | |
| Analyze | Contributing Factors: | |
| Improve | Intervention:<br><br>Re-measure (Graphical Display): | |
| Control | Project Owner:<br>Control Plan:<br><br>Communication:<br><br>Lessons Learned: | |

**Accomplishments:**

# DEFINE

| Define | Measure | Analyze | Improve | Control |

## Objectives

- What is the nature of the problem / gap?
- Outline your project
  - Answer 'the three questions'
  - Develop an Aim & Metric
- Gain support / buy-in

## Tools

- Process Mapping
- Project Outline – AIM Statement / Metric
- Elevator Speech
- Stakeholder Analysis
- Communication Plan
- Voice of Customer

# Process Mapping in Classroom
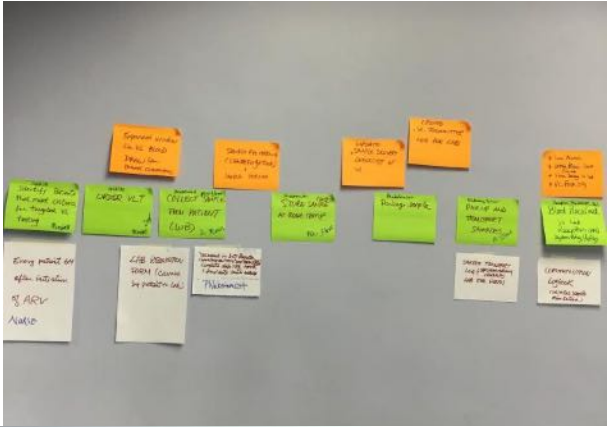
# Go & See - Trace/Validate Process at Site

# Go & See - Trace/Validate Process at Site

# Process Map

| Process Step | What Happens? | Who is responsible? | Duration | Forms/logs | Opportunity for Improvement |
|---|---|---|---|---|---|
| 1. Check in at CTC Clinic | CTC 1 Card accepted; Triage; File pulled | Nurse | Minutes | CTC 1 Card; CTC 2 Card | Outdated CTC 2 – no place for Viral Load (VL) tracking |
| 2. Identify eligible client for Viral Load (VL) test | Review the file; Identify clients eligible for VL test according to country protocol | Nurse | Minutes | Patient file with CTC 2 Card; National Guidelines | No flagging on patient file or highlighting on CTC VL Register to identify HVL pts or those due for VL testing |
| 3. Educate & Obtain Consent for VL Test – Group or Individual | Explain VL testing/significance; Obtain verbal consent for VL testing | Nurse | Minutes | | Let patients know that if VL results are abnormal, they will be called and should be prepared to return early for next appointment; Standardized VL education material |
| 4. Obtain Anthropomorphic Measurements - Check-In | Obtain Height/Weight | Nurse | Minutes | CTC 2 Card | No Streamlined Check-in process |

# QI Tools for Success

**Process Mapping**

**Process Mapping**

**Process Mapping**

There is no substitute for
"Go & See"
Keep Tracing the Patient /
Results

# Measure

Define  →  **Measure**  →  Analyze  →  Improve  →  Control

**Objectives**

- Select a meaningful metric
  - Determine which metric will best evaluate your problem and be most useful to show improvement

- Determine the magnitude of the problem

- Develop a data collection plan

**Tools**

- Observation

- Data Collection/Display Tools
  - Check Sheets
  - Histogram

- Data Collection Plan

# Ask 3 Questions – The Model for Improvement

**AIM** — What are you trying to accomplish?

**METRIC** — How will you know if a change is an improvement?

**CHANGE** — What change will you make that will result in an improvement?

# Getting to your aim statement and metric

**An iterative process**

**Need** ⟶ **Drivers** ⟶ **CTQs**

**Good customer service**

**Knowledgeable reps**
- Answers given by reps are correct
- Reps can answer questions asked without further research
- Researched info returned quickly

**Friendly reps**
- Customers greeted by name
- Customers not interrupted
- Customers asked if they need anything else at the end of the call

**Short waiting time**
- Fast time to live person
- Fast time from live person to answer

General
Hard to measure ⟷ Specific
Easy to measure
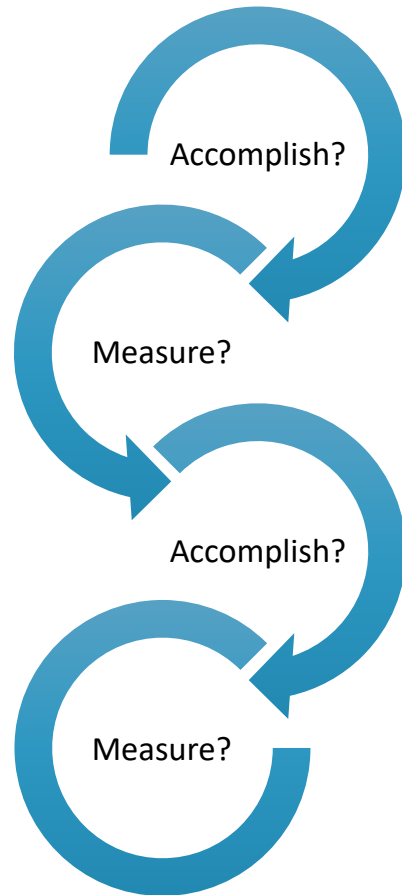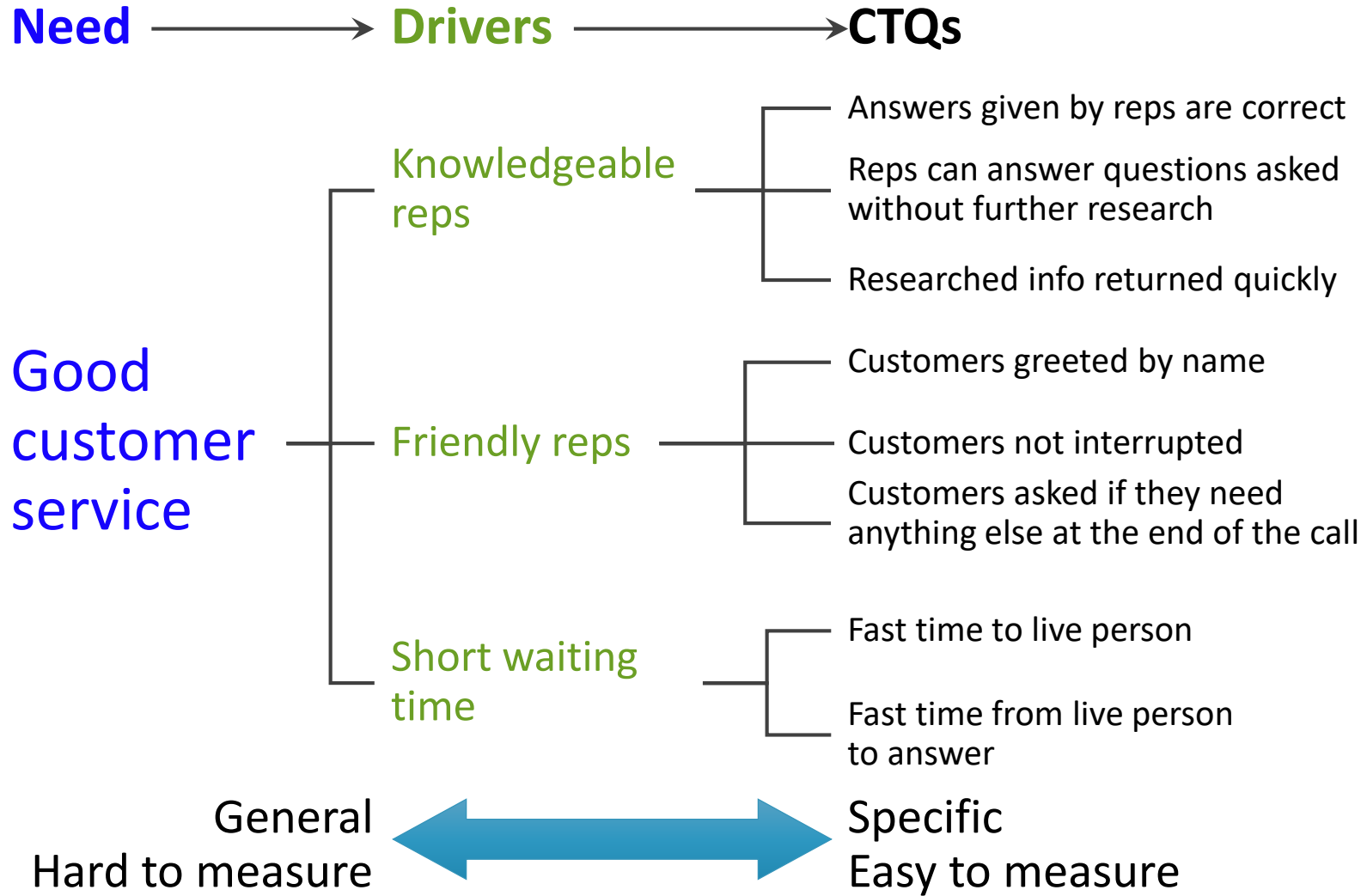
# Getting to your aim statement and metric

**An iterative process**
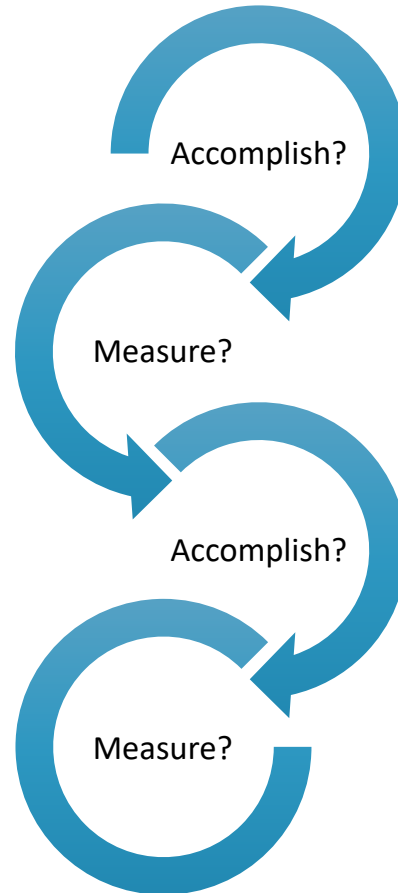


Goal = All patients viral load suppressed

Can I measure that given the time frame of this project?

Goal = High viral load results clinically acted upon

What does that mean?
How am I going to measure that?

What is my numerator & denominator?

Aim Statement

Improve (increase, decrease) _____ (metric) from _____ to ____ by _____ (date).

**Do What, by When?**

# ACTIVITY

**What you will need:**

**Paper**

**Pen**

- Create an "<span style="color:red">Aim Statement</span>" for the ER Exercise by asking the first two of the model for improvement questions

- <span style="color:red">Improve (increase, decrease) _____ (metric) from _____ to _____ by _____ (date).</span>

- Share/Debrief with the Group

4 MIN

# ACTIVITY

**What you will need:**

**Aim Statement PPT**

**Your Aim Statement & Metric**

**Project Outline**

**Pen**

- Rewrite your LARC project "Aim Statement" by asking the first two of the model for improvement questions

- Improve (increase, decrease) _____ (metric) from _____ to _____ by _____ (date).

- Share/Debrief with the Group

**4 MIN**

# Elevator Speech

# Elevator Speech

This project is about

_____

As a result of these efforts,

_____

It's important because we are concerned about:

❖ _____

❖ _____

Success will be measured by showing improvement in:

❖ _____

❖ _____

What we need from you –

_____

# Voice of Customer

# Voice of Customer Survey
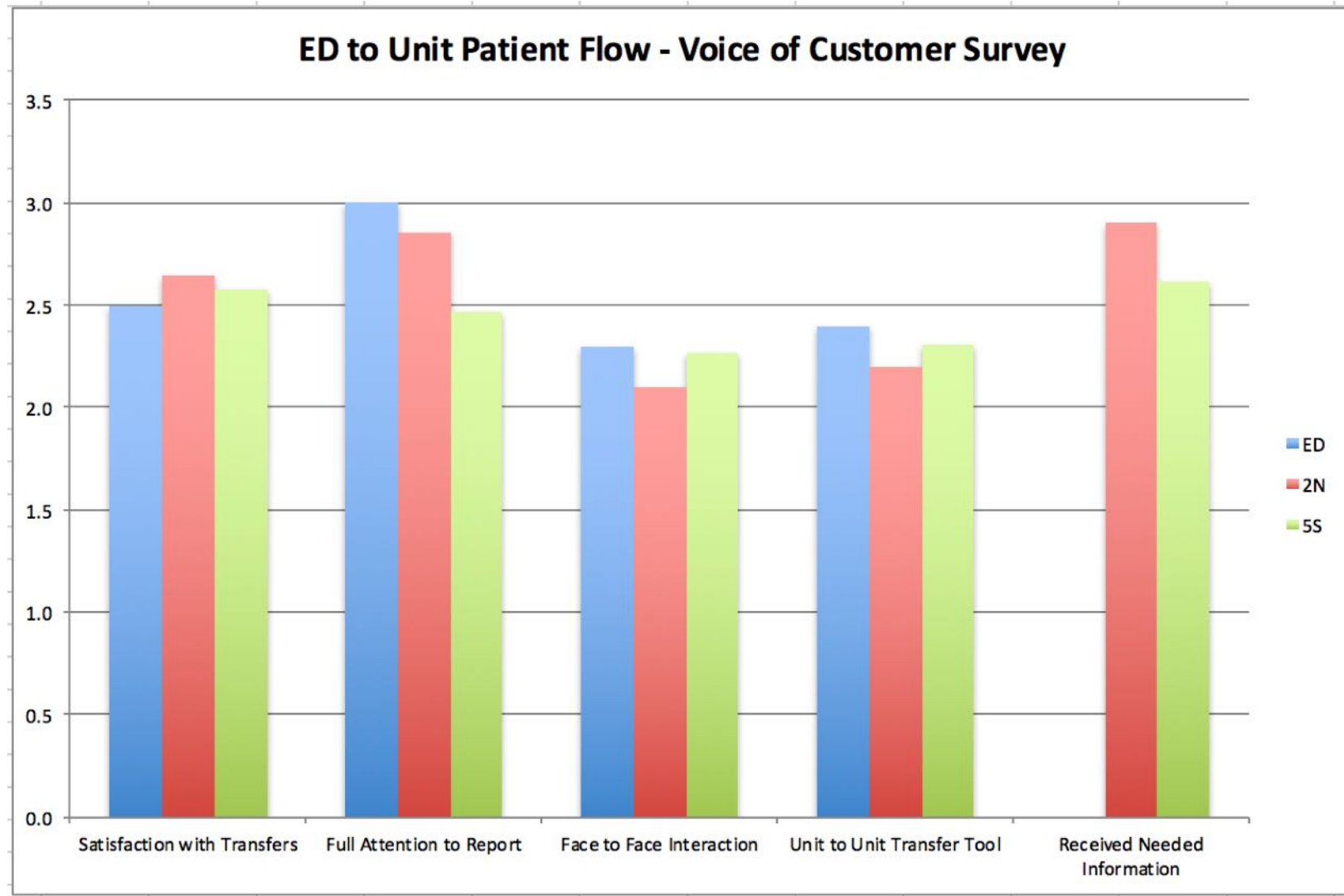
# PROTEA HOTEL
## E N T E B B E

## ARE WE HOT OR NOT?

### WOULD YOU RECOMMEND THIS
### HOTEL TO YOUR FRIENDS OR COLLEAGUES?

**Most Definitely**                                        **Definitely Not**

| 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----|---|---|---|---|---|---|---|---|---|---|
|    |   |   |   |   |   |   |   |   |   |   |

| YOU'RE HOT | MEDIUM | COLD |
|------------|--------|------|

**Dear General Manager**

This is why I think your restaurant is HOT / NOT:

_____

_____

_____

_____

_____

**PLEASE NOTE:** If you would prefer to address your comments to our head office, visit the CONTACT US page on proteahotels.com, where you will find an online version of this form.

**Name:** _____

**Email:** _____

**Room No:** _____

**Arrival Date:** _____

Please tick this box if you do NOT wish to receive email marketing from us: ☐

# Analyze

Define → Measure → **Analyze** → Improve → Control

**Objectives**

- Identify the root cause/s

**Tools**

- Root Cause Analysis
- Fishbone / Cause & Effect / Ishikawa Diagram
- 5 Whys
- Pareto Diagram

## Session 2 Deliverables
## ANALYZE / IMPROVE

- Root Cause Analysis
  - Fishbone Diagram
  - 5 Whys
  - Pareto Chart
- Update Aim Statement, if necessary
- 1 Rapid Test of Change (PDSA)

- 1 5S exercise
- 1 Visual Management Application
- Create Future State Map (if ready)
- Presentation

# Root Cause Analysis

# Root Cause Analysis

## Fishbone Diagram



Patients followed by multiple Physicians / Specialties throughout Clinic

No Standardized System for IVC Follow-up

Lack of Knowledge re: IVC Filter Best Practices

IVC Filters Not Retrieved

No Standardized Guidelines or Protocols for Retrieval

Patients Lost to Follow-up
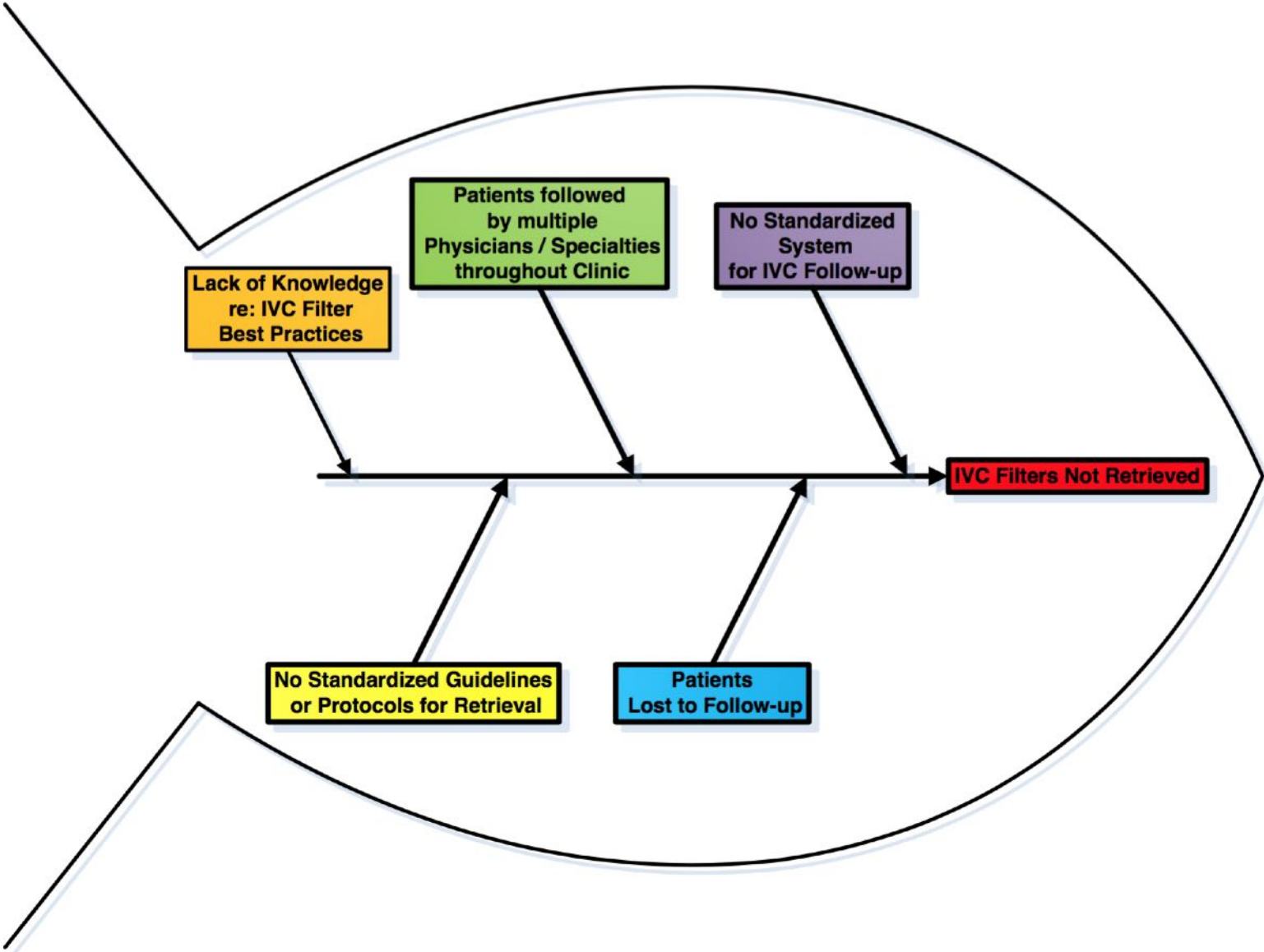
# Pareto Chart

# Pareto Chart
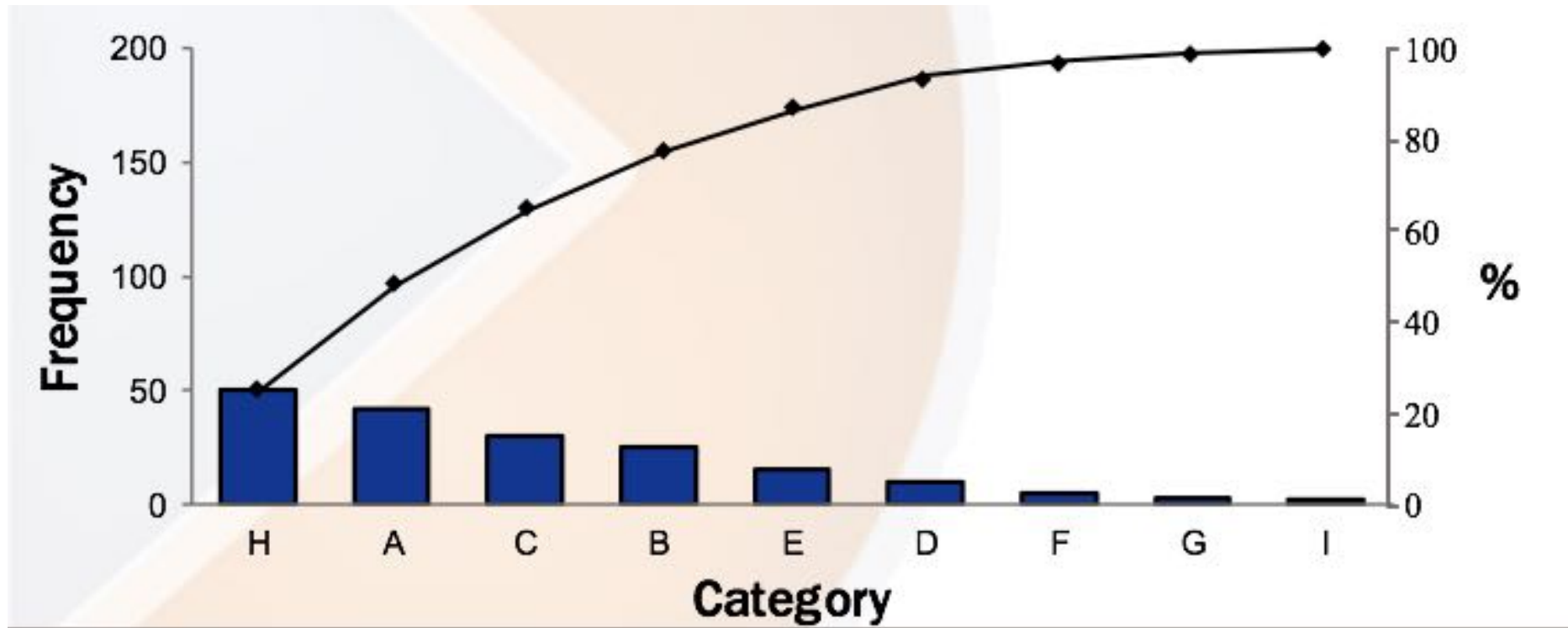
# Spread Sheet – Defects / Ranked

| Title: | | | |
|---|---|---|---|
| **Order Defects** | | | |

**Data:**

| Category | Quantity |
|---|---|
| Wrong Order | 10 |
| Wrong Side | 8 |
| Missing Labs | 3 |
| Wrong Patient | 1 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| All other | |

| Order Defects - ranked | | | |
|---|---|---|---|
| Category | Quantity | % of Total | Cum % |
| Wrong Order | 10 | 45% | 45% |
| Wrong Side | 8 | 36% | 82% |
| Missing Labs | 3 | 14% | 95% |
| Wrong Patient | 1 | 5% | 100% |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| #N/A | | | |
| All other | 0 | 0% | 100% |

**Time Period:** April-Dec 2012

# Example: Ultrasound Order Defects (Errors)



**Pareto Chart**

**Order Defects**

| | Wrong Order | Wrong Side | Missing Labs | Wrong Patient | All other |
|---|---|---|---|---|---|
| Quantity | 10 | 8 | 3 | 1 | 0 |
| Cum % | 45% | 82% | 95% | 100% | 100% |
| % of Total | 45% | 36% | 14% | 5% | 0% |

**Time Period:** **April-Dec 2012**
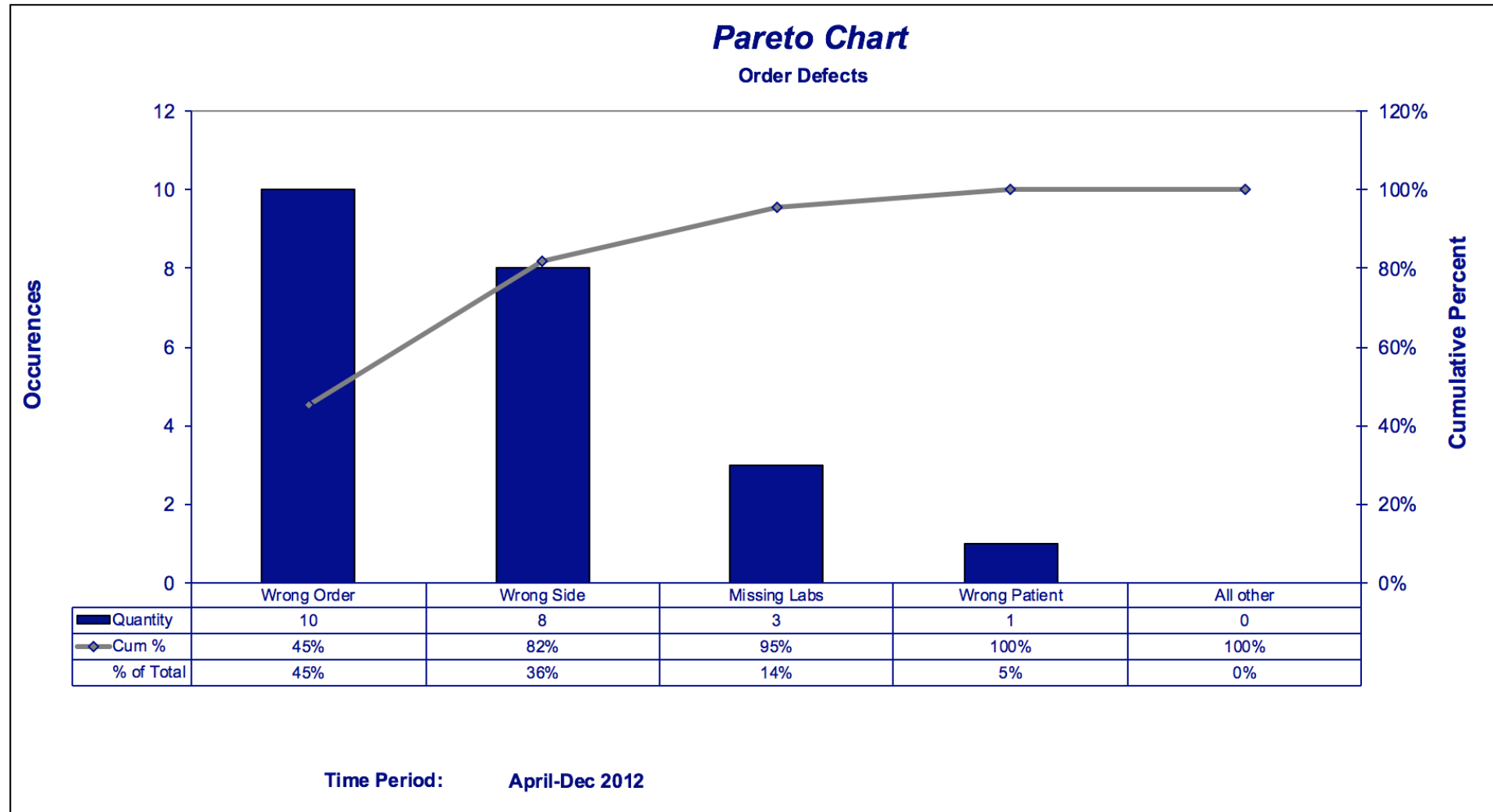
# Improve

Define → Measure → Analyze → **Improve** → Control

## Objectives

- Test Changes
  - Confirm cause & effect
  - Confirm effectiveness of solutions
- Plan for full implementation & spread

## Tools

- Brainstorming
- Affinity Diagram
- Impact Effort Grid
- PDSA Cycles
- Implementation Plan
- Process Map – Future State

# Prioritization of Opportunities

Taking the Process Map to the next step in Improvement

**IMPACT / EFFORT GRID** A Tool for Prioritizing Opportunities

IMPACT

Major Improvement

Minor Improvement

Just Do It

Projects - Detailed planning and work

Just Do It if Impactful

Maybe some day

Easy to Do

Difficult to Do

EFFORT

# Impact Effort Grid

# IMPACT / EFFORT GRID A Tool for Prioritizing Opportunities

**Just Do It**

**Projects - Detailed planning & work**

**IMPACT**

**Major Improvement**

- Copy EAC forms
- Create a High VL logbook
- VL review committee
- Buy phones and airtime
- Provide binders
- Flagging system- stickies
- Buy blue board
- High VL Lab report
- Visit to site monthly

- Call HVL patients to assure followup
- Mornitorng lab result retrieval
- Reduction of TAT
- Providing bus fee for sample transportation by peer group
- Standardize result reporting
- Create SOP
- Mentorship & training

**Minor Improvement**

**Just Do It
if
Impactful**

- Provide VL machine
- Provide vehicle for sample transportation
- Staff employment

**Maybe
some day**

**Easy to Do**

**Difficult to Do**

**EFFORT**

# Action Plan

| Action Item | By whom? | By When? |
|---|---|---|
| 1. Create Hand-off Tracking Sheet | Sehlephi (ICAP) | July 12 |
| 2. Supply high VL in-boxes for ART clinic | Dan (CDC) | July 12 |
| 3. Produce site-level high VL result report by month | Sindisiwe (NRL) | July 13 |
| 4. Collect baseline data | Hloniphile (Site) | July 15 |
| 5. Revise LARC proposal | Dan (CDC) | July 15 |
| 6. Analyze baseline results | Sindisiwe (NRL) | July 29 |
| 7. Create PowerPoint for Tanzania meeting | Dan (CDC) | July 29 |
| 8. Send sample rejection criteria to clinic | Siphiwe (NRL) | July 31 |
| 9. Share VL training curriculum | Katy (CDC) | July 31 |
| 10. Contact CNO for national algorithm training on site | Sindisiwe (NRL) | August 31 |
| 11. Clarify job description for Expert Client - Include timely filing of viral load test results to patient charts | CNO MOH | November 1 |

# The Model for Improvement

| What are we trying to accomplish? | How will we know if a change is an improvement? | What change will we make that will result in an improvement? |
|---|---|---|
| **Overarching Goal**<br><br>Improve the care & management for patients with high HIV viral load, specifically addressing the result reporting/clinician interpretation step of the viral load cascade | **AIM Statement**<br><br>**Increase the percentage of high viral load patients with documented appointment and timely clinical follow-up**<br><br>➢ from 12% to 50% by 22 July 2016 (Short term aim = Follow-up appointment scheduled)<br>➢ from 50% to 80% by 31 October 2016 (Long term aim = Counseling and second viral load recorded)<br><br>**Metric:**<br><u># of patients who meet follow-up criteria</u><br># patients with high viral load | **NEW LOG / NEW PROCESS**<br><br>**Track Handoffs and Clinical Actions related to High VL Test Results**<br><br>⬇<br><br>**Appropriate Clinical Care for Patients** |

# Small Test of Change = PDSA

# The Model for Improvement (IHI)
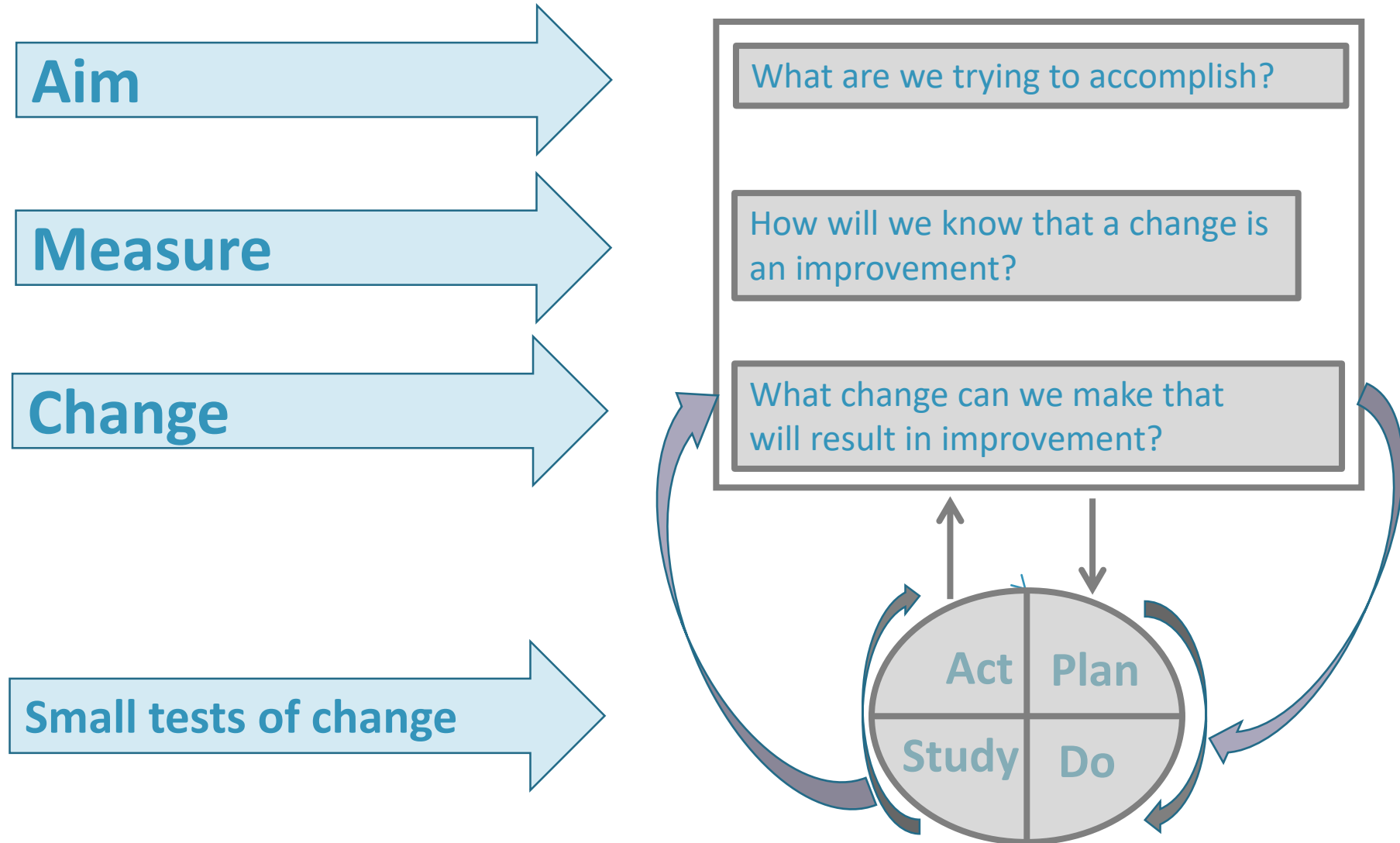
# PDSA - Small Test of Chance (July)

- Worked well ➡ Standardize
- Did not work ➡ Create new test of change (PDCA)
- Worked partially ➡ "Tweak" and begin PDCA #2

⬆ % of high VL patients scheduled for F/U appointment from ___ to 50%
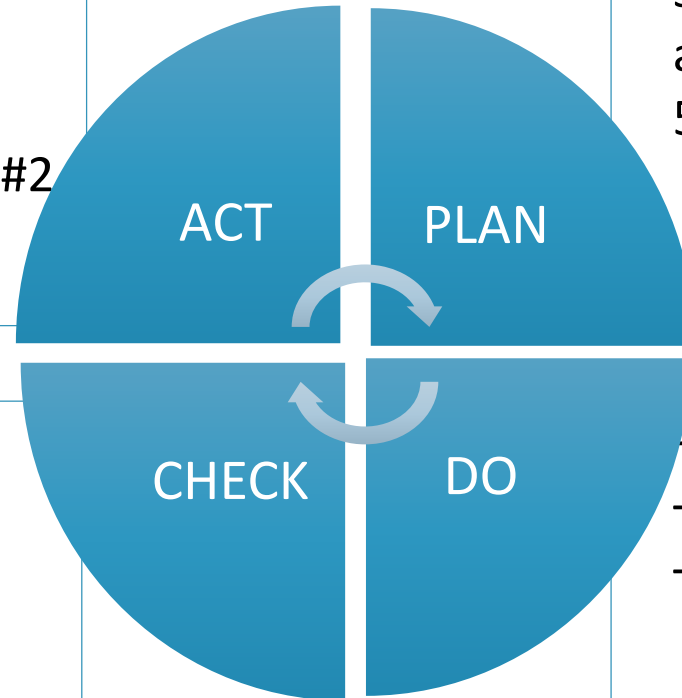
Analyze Data (by 29 July)
- Met goal?
- Why/Why not?

Test new Daily High VL Tracking Log on Tuesdays & Thursdays 12-22 July

ACT    PLAN

CHECK    DO

PDSA – Not one and done!



Repeated Use of PDSA Cycle

CHANGES THAT RESULT IN IMPROVEMENT

IMPLEMENTATION AT SCALE

WIDER SCALE TESTS OF CHANGE

FINE TUNING TESTS

SMALL-SCALE TESTS

DATA
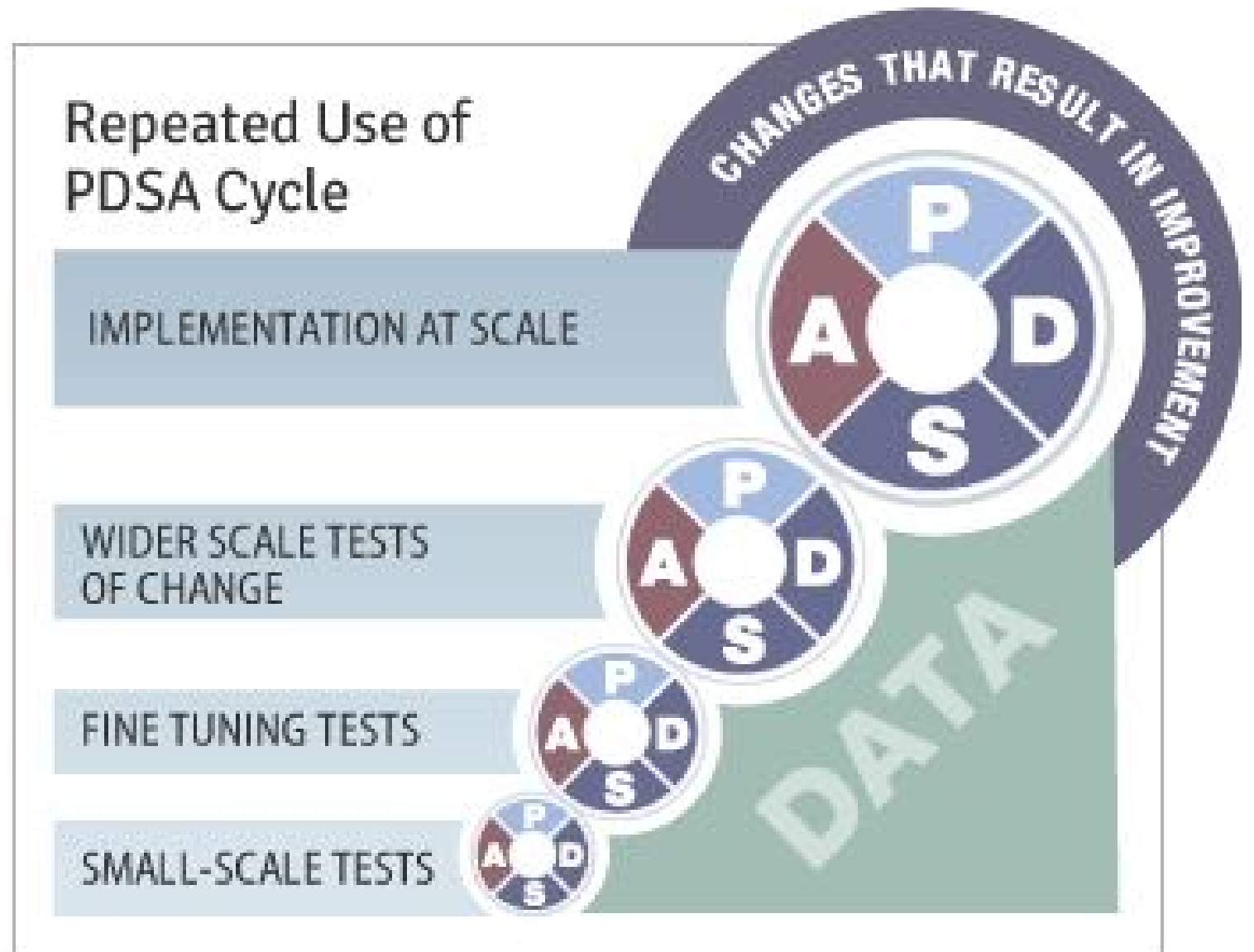
# Armed with Tools –
# Now Work on Your ED Flow Again

# Things to Ponder…

- Wastes that can be eliminated
- PDSA may not be perfect first time
- Combine responsibilities
- Establish pull
- No batching
- Reduced distances and transport
- What is critical to patient outcome
- Better communication
- Supplies at point of use
- Ergonomics
- Built in quality

- Level workload
- What is of value
- Proper training and multiple competencies
- Reduce patient and staff waiting
- Visual indicators
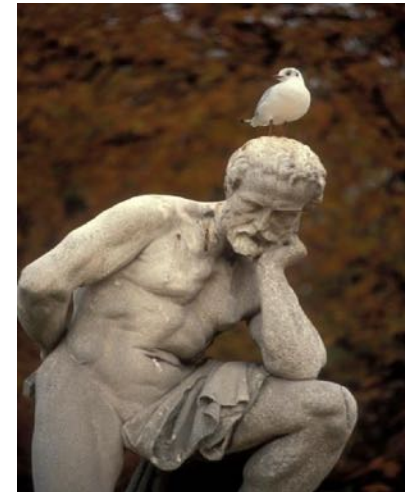
# ACTIVITY

**What you will need:**

**Table top signs (Workstations)**

**Work Instructions**

**Patients (Dot Sheets)**
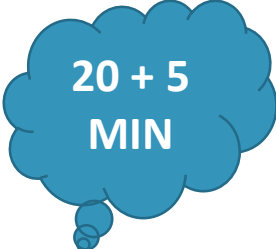
**Dots – Multiple Colors**

**Timer**

**Flip Chart**

**Markers**

- Conduct an Emergency Department Simulation: <span style="color:red">Provide "care" (dots) to your "patients" (paper sheets)</span>
- <span style="color:red">Redesign your process</span> using the tools learned today
- **Goal:** "Treat" as many patients as possible in the time given
- Debrief with the group

20 + 5 MIN

## Session 3 Deliverables
### CONTROL

- Update Aim Statement, if necessary
- Validate Solution(s)/Interventions
- Modify Solution(s) where necessary by additional Tests of Change (PDSA)
- Create Control Plan
- Transfer to Operational Owner
- Communicate Results / Spread Best Practices / Final Presentation

# Control

**Define** ▶ **Measure** ▶ **Analyze** ▶ **Improve** ▶ **Control**

**Objectives**

- Document the project
- Show results
- Hand over to process owner
- Ensure **sustainability** of project
- Spread Improvement

**Tools**

- Project closure documentation
- Control Plan/Audit
- Performance Dashboard

# Project Closure Documents



**MCF Lean Wave X**

**Project Name Here**

**DEFINE: Goal Statement / Problem / Objective**

<u>Goal Statement</u> should be **one** sentence: Quantified, specific to scope and has a timeframe for completion.

<u>The Next sentence</u> (or bullet) should answer "The Why": Why did you do this project or why was the problem occurring?

**For example:**
- Reduce cycle time for medication renewals by 50% from 20 hours to 10 hours in Primary Care (FAM, CIM, & DRM) by May 1, 2012.
- Reduced cycle time is important because patient satisfaction and safety depend on the ability to respond to patient requests in a timely and accurate manner. An improved process will reduce delivery time for time sensitive medications and reduce the risk of an error.

**IMPROVE: Results**

What did you learn?
- What interventions did you try? What was the impact of your pilot/PDSA on your metrics? How did it affect your objectives?

Suggestions: 2x2 Matrix (PDSA)

- If you achieved your goal, is there a process in place for continued monitoring? Who owns the process once the project is complete?

- If you haven't achieved your goal, what is your plan to continue? Additional PDSA cycles?

**MEASURE & ANALYZE: Baseline / Analysis / Tools**

What was the baseline measure?

Insert a tool that helped you:
- Narrow the focus/scope
- Determined the root cause
- Understand the current condition (process)
- Identify the greatest area of waste identified / eliminated

What actions were taken based on tool usage?

Suggestions: Pareto chart, Fishbone, 5S, Process Map

**CONTROL: Next Steps**

Short Term or Long Term depending where you are with the project

Did you complete your deliverables? Communicate to stakeholders? Etc. (Optional: replace bullets with table if preferred)

Do you need Senior Leadership help? If so, what kind?

| What? | Who? | When? |
|---|---|---|
| Deliverable 1 | | |
| Deliverable 2 | | |
| Communicate to Stakeholders | | |
| Etc. | | |

MAYO CLINIC

## Dermatology / Pathology Lean Team
### Project Closure

Celebrate Success → Look to next steps

29 June 2015

# Sustain the Gains



**Why It Matters**
"A system has to make a choice to be high performing. It's a conscious choice to improve and maintain the improved level of performance. It's not an accident."

### Tips for Sustaining Your Hard-Won Improvements
By *Kedar Mate* | Tuesday, September 20, 2016

Please answer the following questions based on the article:

1. Where does improvement take place?
   a. _____

2. Who are the key leaders in sustaining improvement?
   a. _____

3. Name 5 practical things that clinical leaders do to sustain improvement?
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____

4. Which one of these practical steps can you implement by next Tuesday?
   a. _____

5. What are the first two steps to take to implement a high-performance management system?
   a. _____
   b. _____

# 2 North Commitment To Safety

## Goals

What is the
problem?

What are
we doing about it?

Was it
Successful?

Oxygen Weaning in Progress

2 North BCMA Utilization

Just Do It

# All these tools – When/Where/How to Use?

Case Studies

# Wrap Up

# Lessons Learned

QI Tools / Essential Elements for Success

# Essential Elements of Success

1. Leadership
    - Culture
    - Leveraging Accreditation & Regulatory Requirements
2. QI Expertise / Interest / Mentorship
3. Setting an Aim/Goal
4. Action Plan
5. Data/Informatics Facilitator
6. Team Engagement
    - Engaging the cross-cadre team in "**seeing**" the process leads to engagement of all the team members in **improving** the process

# Thank You