Quality Improvement Basics

QI 101, 102, 103

IHI Open School

QI Curriculum Goals

- Introduction to Quality Improvement (QI) and Patient Safety
- Learn and apply concepts from the Institute for Healthcare Improvement (IHI) Quality Improvement model
- Conduct a longitudinal QI project
- QI projects will be developed in association with hospital-wide stakeholders
- QI projects will be presented locally with the opportunity for national publication
- Internal Medicine residents will become leaders in local quality improvement

- How many Americans die each year due to mistakes in their health care?

- According to the National Academy of Science's Institute of Medicine, between **44,000** and **98,000** Americans die in hospitals each year due to mistakes in their care.

- *"Between the health care we have and the care we could have lies not just a gap, but a* **chasm**.*"* – IOM Report 2001
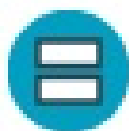
QI 101: Introduction to Health Care Improvement

1. Describe common challenges for health care systems around the world.

2. List the six dimensions of health care, and the aims for each, outlined by the Institute of Medicine (IOM) in 2001.

3. Explain the value of improvement science in health care.

Health and Health Care Today

- Data from the Commonwealth Fund found:
  - "Despite having the most expensive health care system, **the United States ranks last overall among 11 industrialized countries on measures of health system quality, efficiency, access to care, equity, and healthy lives** … While there is room for improvement in every country, the US stands out for having the highest costs and lowest performance — the US spent **$8,508** per person on health care in 2011, compared with **$3,406** in the United Kingdom, which ranked first overall."
- Dr. Goldmann, the CMO of IHI, explains what it is about the US health system that needs improvement
  - Crossing the Quality Chasm
  - The Role of the Provider
  - Opportunities to Improve?

The IOM's Six Aims for Improvement

Safe: Avoiding injuries to patients from the care that is intended to help them

Timely: Reducing waits and sometimes harmful delays for patients and providers

Effective: Providing the appropriate level of services based on scientific knowledge

Efficient: Avoiding waste, including waste of equipment, supplies, ideas, and energy

Equitable: Providing care that does not vary in quality because of personal characteristics

Patient-Centered: Providing care that is respectful of and responsive to individual patients

Hospital Compare: How Do We Compare?

- **Timely and effective care**: How often and how quickly each hospital gives recommended treatments for certain conditions like heart attack, heart failure, pneumonia, children's asthma, and for surgical patients

- **Readmissions, complications, and deaths**: How each hospital's rates of readmission and 30-day mortality rates for certain conditions compare with the national rate, how likely it is that patients will suffer from complications while in the hospital, and how often patients in the hospital get certain serious conditions that might have been prevented if the hospital followed procedures based on best practices and scientific evidence

- **Use of medical imaging**: How a hospital uses outpatient medical imaging tests (like CT scans and MRIs)

- **Survey of patients' experiences**: How recently discharged patients responded to a national survey about their hospital experience; for example, how well a hospital's doctors and nurses communicate with patients and how well they manage their patients' pain

- **Number of Medicare patients**: How many people with Medicare have had certain procedures or have been treated for certain conditions at each hospital

- **Medicare payments**: Information about how much Medicare pays hospitals

QI 102: How to Improve with the Model for Improvement

1. List the three questions you must ask to apply the Model for Improvement.

2. Identify the key elements of an effective aim statement.

3. Identify three kinds of measures: process measures, outcome measures, and balancing measures.

4. Use change concepts and critical thinking tools to come up with good ideas for changes to test.

5. Test changes on a small scale using the Plan-Do-Study-Act (PDSA) cycle.

State the three fundamental questions that are the basis of the Model for Improvement

- What are we trying to accomplish?
  - ➢You ask this to establish your **aim**.

- How will we know a change is an improvement?
  - ➢You ask this to establish your **measures.**

- What change can we make that will result in improvement?
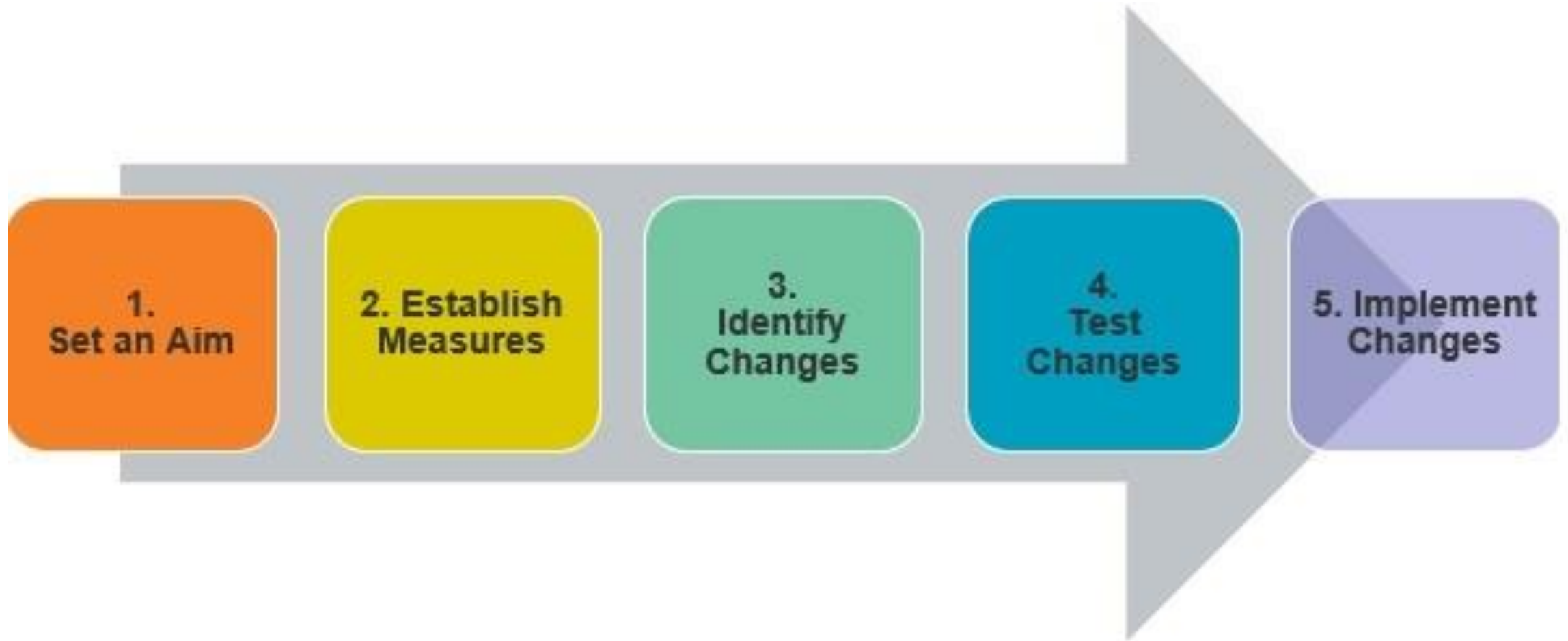 - ➢You ask this to determine the **changes** you will test.
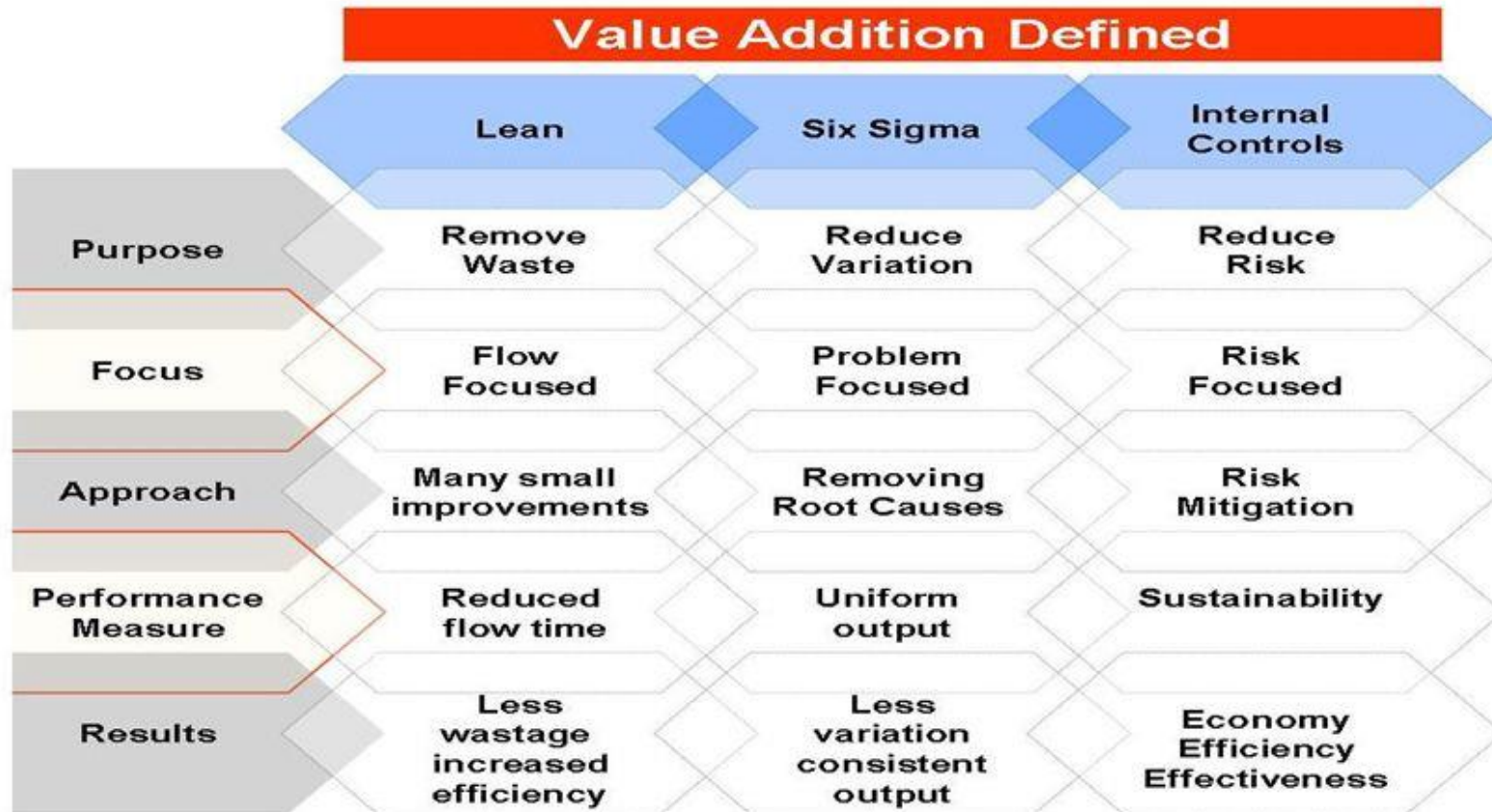
MFI: Three Questions and a Cycle
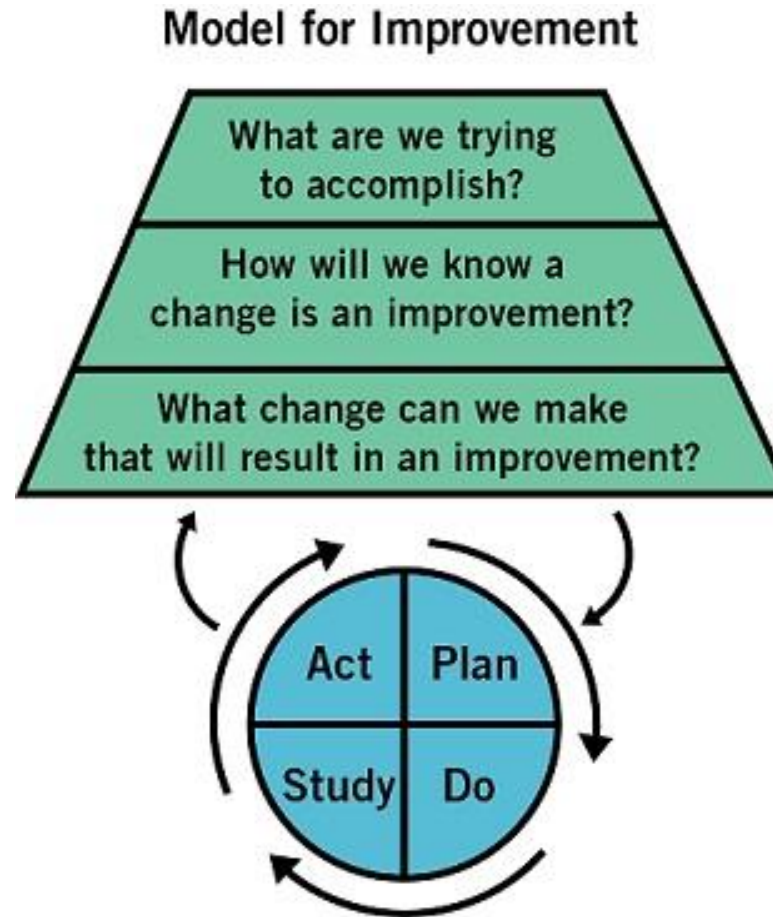
State the three fundamental questions that are the basis of the Model for Improvement

- Aim
- Measures
- Changes

Using the MFI to Improve Care

Lean Vs. Six sigma

	Value Addition Defined		
	Lean	**Six Sigma**	**Internal Controls**
Purpose	Remove Waste	Reduce Variation	Reduce Risk
Focus	Flow Focused	Problem Focused	Risk Focused
Approach	Many small improvements	Removing Root Causes	Risk Mitigation
Performance Measure	Reduced flow time	Uniform output	Sustainability
Results	Less wastage increased efficiency	Less variation consistent output	Economy Efficiency Effectiveness

Setting an Aim: What are we trying to accomplish?

- A good aim addresses an issue that is important to those involved; it is **specific**, **measurable**, and addresses these points:
  - **How good?**
  - **By when?**
  - **For whom (or what system)?**

- Guiding Principles for Aim Setting

Aim Statements: Strong or Weak?

1. "I'm going to run more frequently so that I can run a half marathon."

2. "Our pod goal is to complete all the documents of the IHI practicum by April."

3. "In order to improve my patients' medication adherence, I will do a medication reconciliation on all of my clinic A patients so that they understand which medications to start/continue/discontinue when they leave."

4. "I'm going to double the amount of money in my emergency savings account by the end of third year by setting up an automatic deposit with each monthly paycheck."

Each of the following is an example of a strong/weak aim statement:

1. "I'm going to run more frequently so that I can run a half marathon."
    How good? ~~By when?~~ For whom (or what system)? Weak

2. "Our pod goal is to complete all the documents of the IHI practicum by April."
    How good? By when? For whom (or what system)? Strong

3. "In order to improve my patients' medication adherence, I will do a medication reconciliation on all of my clinic A patients so that they understand which medications to start/continue/discontinue when they leave."
    ~~How good? By when?~~ For whom (or what system)? Weak

4. "I'm going to double the amount of money in my emergency savings account by the end of third year by setting up an automatic deposit with each monthly paycheck."
    How good? By when? For whom (or what system)? Strong

Choosing Measures

- **Outcome measures** are the measures you ultimately want to move. They tell you how the system is performing, i.e., what is the ultimate result?

- **Process measures** tell you if the parts or steps in the system are performing as planned to affect the outcome measure.

- **Balancing measures**, which are often not directly related to the aim, assess whether the changes designed to improve one part of the system are introducing problems elsewhere.

Define Measures

Aim: Arrive on time for work, class, meetings, and other appointments 100 percent of the time within three months

Aim: Decrease the average HbA1c level of the population of patients with diabetes to less than 7.0 within 12 months

Outcome Measure *Where are we ultimately trying to go?*	Percent of the time you arrive punctually	HbA1c level for patients with diabetes
Process Measure *Are we doing the right things to get there?*	Number of days/week you wake up early for work	Percent of diabetes patients whose HbA1c level was measured twice in the past year
Balancing Measure *Are the changes introducing problems?*	Level of perceived sleep deprivation on a scale of 1–5	Number of minutes spent with each diabetes patient

Change Concepts

Category	Change Concept	Questions to Ask	Example
1. Eliminate Waste	Eliminate things that are not used	Can you think of an activity or resource that doesn't add value?	Can you shorten the meetings? Are weekly meetings necessary?
2. Improve Workflow	Find and remove bottlenecks	Is the some aspect of your process where the work doesn't happen as smoothly as it should?	Do you have an agenda for each meeting? Is it clear what you will accomplish?
3. Optimize Inventory	Match inventory to predicted demand	Do you have too much or too little of the items you use or provide? Is your work held up because items are poorly organized or not available?	Do you have access to a laptop to show everyone the new flyers?
4. Enhance the Producer/ Customer Relationship	Focus on the outcome to a customer	What are the needs of the people you serve? Do they understand the value of your services? Do they have ideas for ways you can improve?	At the end of every meeting, do you ask people if there are ways to improve your project?
5. Change the Work Environment	Take care of basics	Changing the work environment itself can make all other process changes more effective. Does the culture resist or embrace new ideas?	Perhaps you need to hold the meeting in a quiet space. Are people too easily distracted?
6. Manage Time	Reduce setup or startup time	Can you cut down on the time it takes to do anything in the organization — whether it's waiting times or the time to develop a new idea or product?	Can you send out the agenda before the meeting so volunteers can come prepared?
7. Manage Variation	Standardization (create a formal process)	What aspects of your systems vary and make your outcomes unpredictable?	Is it possible to find a time that works for everyone and create a routine in volunteer's schedules each week?
8. Design Systems to Prevent Errors	Use reminders	Can you make it harder for people in your system to make mistakes? For instance, can you make the information necessary to perform a task available	Can you send out a reminder so that volunteers don't forget about the meeting?
9. Focus on the Design of Products and Services	Offer product/service anyplace	Is the service or product you provide a good one? Can it be better?	What if you allowed people to attend meetings virtually, by calling in?

QI 103: Testing and Measuring Changes with PDSA Cycles

1. Describe how to establish and track measures of improvement during the "plan" and "do" phase of PDSA.

2. Explain how to learn from data during the "study" phase of PDSA.

3. Explain how to increase the size and scope of subsequent test cycles based on what you're learning during the "act" phase of PDSA.

PDSA Cycle

1. **Plan.** *Plan the test, including a plan for collecting data.*
   - *State the objective of the test.*
   - *State the questions you want to answer, and make predictions.*
   - *Develop a plan to test the change. (Who? What? When? Where? What data do you need?)*

2. **Do.** *Try out the test on a small scale.*
   - *Carry out the test.*
   - *Document problems and unexpected observations.*
   - *Begin to analyze the data.*

3. **Study.** *Try out the test on a small scale.*
   - *Complete your analysis of the data.*
   - *Compare the data to your predictions.*
   - *Summarize and reflect on what you learned.*

4. **Act.** *Refine the change, based on what you learned from the test.*
   - *Determine what modifications you should make.*
   - *Prepare a plan for the next PDSA.*

Data Collection Plan

TEST CYCLE #:

RECORDER:

DATE: __ / __ / __

TIME: __ : __

	Hands washed before? (Y/N)	Hands washed after? (Y/N)	Type of cleanser?	Notes
PATIENT #1				
PATIENT #2				
PATIENT #3				
PATIENT #4				

Run Chart

- Run charts are a simple and effective way to determine whether the changes you're making are leading to improvement. These are the basic ingredients of a run chart:
  - X axis, for plotting time
  - Y axis, for plotting the variable you're measuring
  - Goal line, indicating the result you're working toward
  - Annotations, showing when the team made specific process changes or noteworthy events occurred

Average Number of Minutes in the ED Per Patient
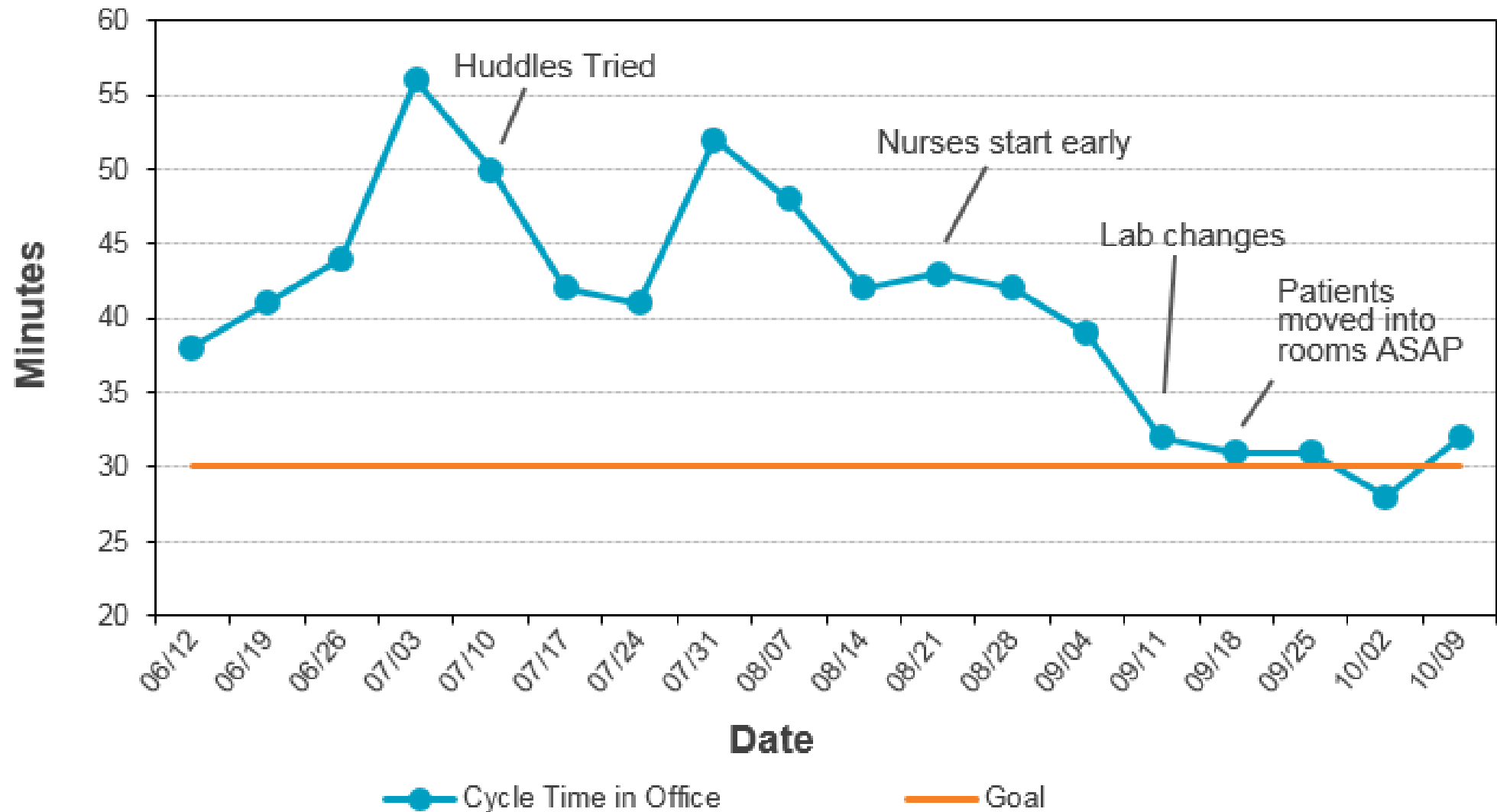
Cause and Effect Diagrams: "Fishbone"

- **Materials** (supply, design, availability, and maintenance)
- **Methods** (steps in care process and steps in supply chain)
- **Environment** (staffing levels and skills, workload and shift patterns, administrative and managerial support, and physical plant, policies, and regulations)
- **Equipment** (any equipment/tools needed to get the job done)
- **People** (staff knowledge and skills/training, competence, patient behavior, and supervision)

Stratifying Data

- You can stratify data by lots of variables, for example:

- Time periods

- Organization or unit

- Demographics such as age, sex, socioeconomic group, or ethnic group

- Treatment location

- Treatment method

- Provider (Note: If your population is relatively small, stratification might make it possible for people to know which provider yielded which result. In that case, you might want to code the data to protect providers' privacy. The goal of using data for improvement is learning — not judgment!)

Scale (x5) & Scope

- **Scale** refers to the timespan or number of events included in a test cycle — such as a specific number of patient encounters. When you scale up your test of change, you're thinking about *more* (more patients, more time, more events).

- **Scope** refers to the variety of conditions under which your tests occur — such as different combinations of patient, staff, and environmental conditions. When you expand the scope of your test, you're thinking about *difference* (different patients, different times, different staff).

Running Concurrent Test Cycles

Change 1   Change 2   Change 3
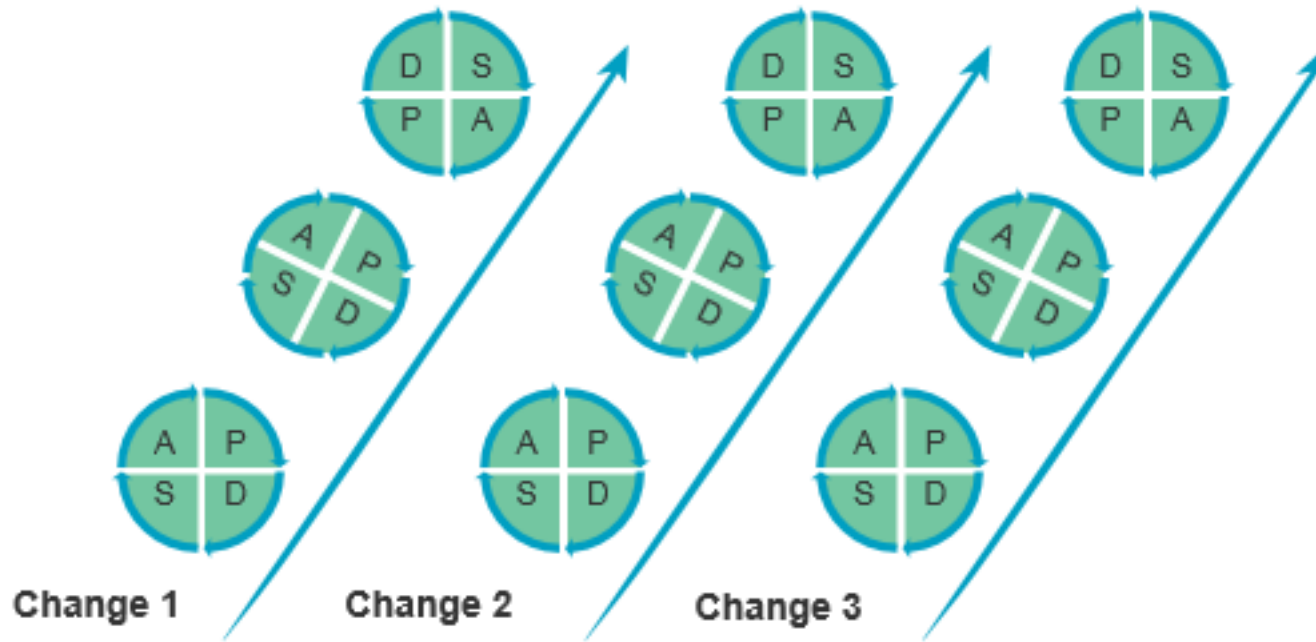
Recap
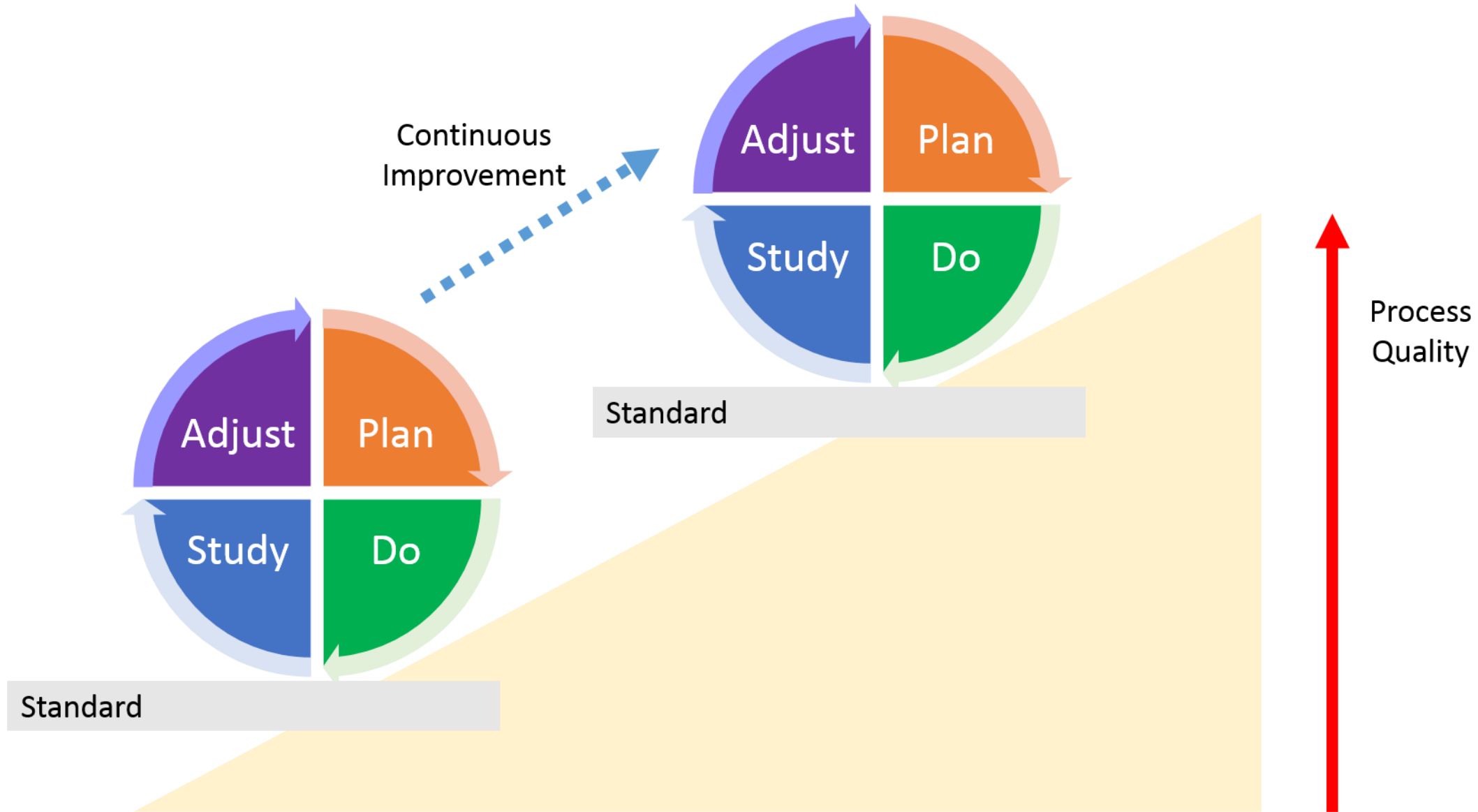
Implementing Improvement Example

- Implementation of a change requires that staff and leaders have built the change into formal plans, job definitions, training, and explicit reviews. You know a change has been implemented when you could have 100 percent staff turnover of the people who were involved in the original tests and studies, and the change would still remain in place — as part of the system.

Use the Model for Improvement to begin your own personal improvement project

- Complete the teacher-learner agreement
- Email/give it your mentor for signature

Use the Model for Improvement to begin your own personal improvement project

- Develop an effective aim statement for your own personal improvement project.

- Complete the "What are we trying to accomplish" portion of the Project Charter document

Open School

Project Title:

Team Members:

University/Organization Name:

What Are We Trying to Accomplish?

Problem

Describe in 2–3 sentences the existing condition you hope to improve (i.e., the gap in quality):

Rationale

Explain in 4–5 sentences why the current system or process needs improvement. Include baseline data and relevant benchmarks, e.g., from the literature:

Aim Statement

What outcome, in measureable terms, are you hoping to accomplish? Specify **how good, for whom, and by when** — i.e., by what *exact date*:

Expectations

Why have you chosen the aim you've set forth? Explain, in specific terms, what you believe will be the beneficial outcomes of this project:

Due for next QI block:

- Return Practicum Teacher-Learner Agreement signed by mentor (email with e-sig is fine if it comes directly from mentor)

- Return Project Charter with "What Are We Trying to Accomplish" completed (electronic version ok)

Avedis Donabedian

- Avedis Donabedian (7 January 1919 – 9 November 2000) was a physician and founder of the study of quality in health care and medical outcomes research, most famously as a creator of The Donabedian Model of care.

- "Systems awareness and systems design are important for health professionals, but they are not enough. They are enabling mechanisms only. It is the ethical dimensions of individuals that are essential to a system's success. Ultimately, the secret of quality is love. You have to love your patient, you have to love your profession, you have to love your God. If you have love, you can then work backward to monitor and improve the system."