

# Quality Improvement

+

# Change Management



Institute for Healthcare Quality,  
Safety and Efficiency

SCHOOL OF MEDICINE

UNIVERSITY OF COLORADO **ANSCHUTZ MEDICAL CAMPUS**

Disclosures

**NONE**

# Agenda

**1 Introduction of Faculty**

**2 Intro QI**

————— BREAK —————

**3 Change Management**





YOU ARE  
HERE

| <b>Session</b>                                     | <b>2023-2024 Dates &amp; Times*</b>                |
|--|--|
| <b>Quality Improvement &amp; Change Management</b> | January 11: 1-4 p.m. MT<br>January 24: 1-4 p.m. MT |
| <b>Applied Patient Safety</b>                      | January 18: 1-4 p.m. MT                            |
| <b>Acquiring Data to Drive Change</b>              | February 7: 1-4 p.m. MT                            |
| <b>Designing for Change</b>                        | February 14: 1-4 p.m. MT                           |
| <b>Spreading Change Locally and Nationally</b>     | <i>February 22: 1-4 p.m. MT</i>                    |
| <b>Coaching and Teaching Quality Improvement</b>   | March 7: 1-4 p.m. MT                               |





# Quality Improvement

# QI = Quality Improvement

***Systematic*** and ***continuous*** actions that lead to ***measurable*** improvement in health care services and the health status of targeted patient groups.



# Value

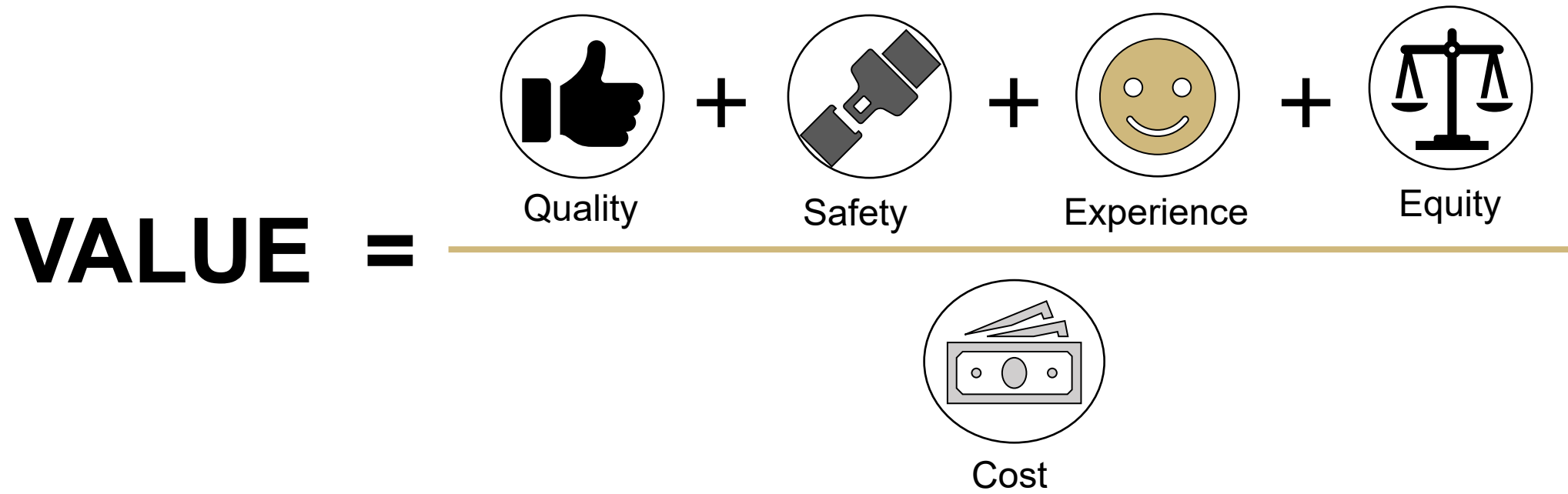
# QI = ~~Quality~~ Improvement

Systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted patient groups.





**VALUE** =  $\frac{\text{Quality} + \text{Safety} + \text{Experience} + \text{Equity}}{\text{Cost}}$





# Models of Quality Improvement

PDSA/Model for Improvement

Six sigma

Lean





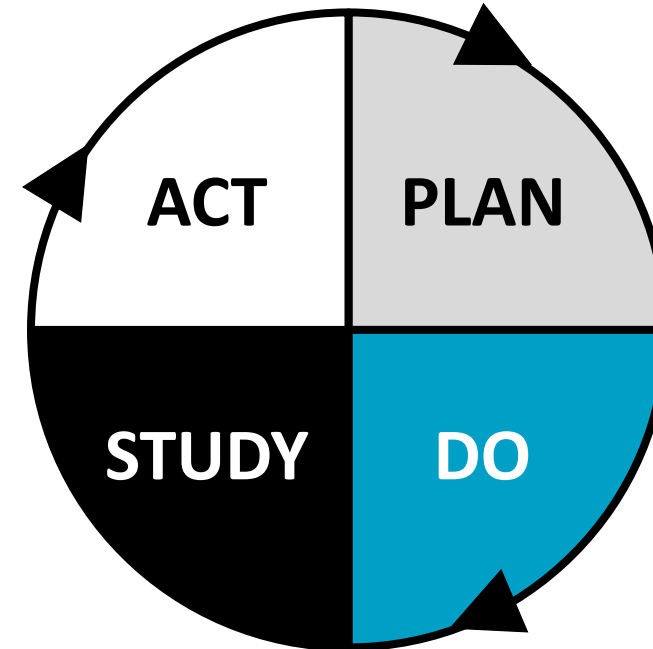
Institute *for*  
Healthcare  
Improvement

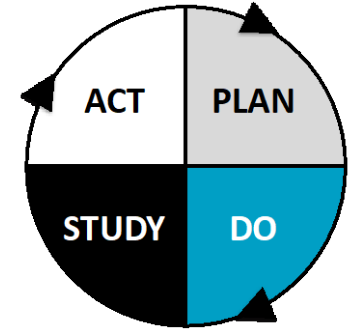
### Model for Improvement

What are we trying to accomplish?

How will we know that change is an improvement?

What changes can we make that will result in an improvement?





**Plan:** identify your problem, analyze contributing factors, and determine an intervention

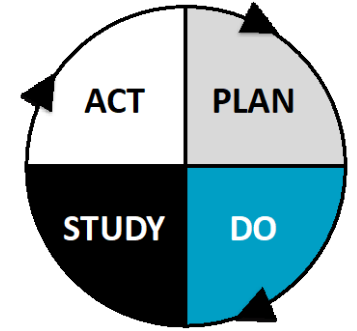
**Do:** implement the intervention

**Study:** evaluate the results of the intervention

**Act:** determine what to do next to sustain or improve



Institute *for*  
Healthcare  
Improvement



**Plan:** identify your problem, analyze contributing factors, and determine an intervention

**UNDERSTAND YOUR  
PROBLEM FIRST !!!**



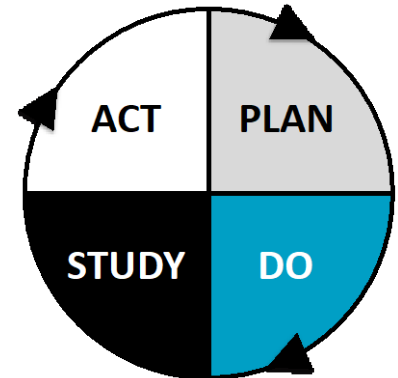
# 6σ

## Six Sigma

“six” standard deviations from mean  
(error rate of one per 3.4 per million)

**DMAIC** (*də-MAY-ick*)

Define, Measure, Analyze, Improve, Control



# 6σ

## Six Sigma

“six” standard deviations from mean  
(error rate of one per 3.4 per million)

**UNDERSTAND YOUR  
PROBLEM FIRST !!!**





# Lean

Maximize value while *through* minimizing waste.

改善

Kaizen



# 改善



## Eight Forms of Waste in Healthcare



Underutilization



Inventory



Motion



Defects



Transportation



Waiting



Extra Processing



Overproduction



6σ

Six Sigma

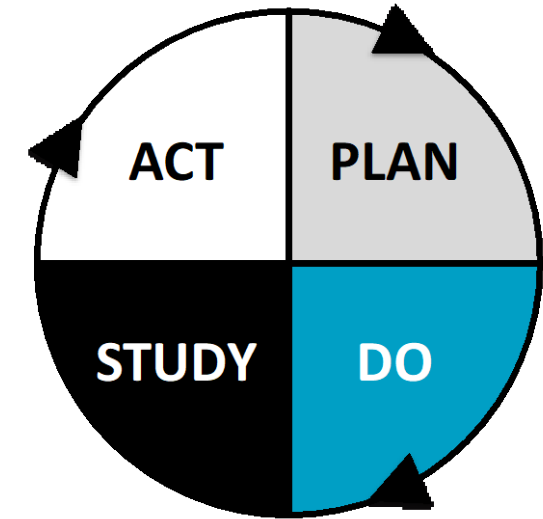
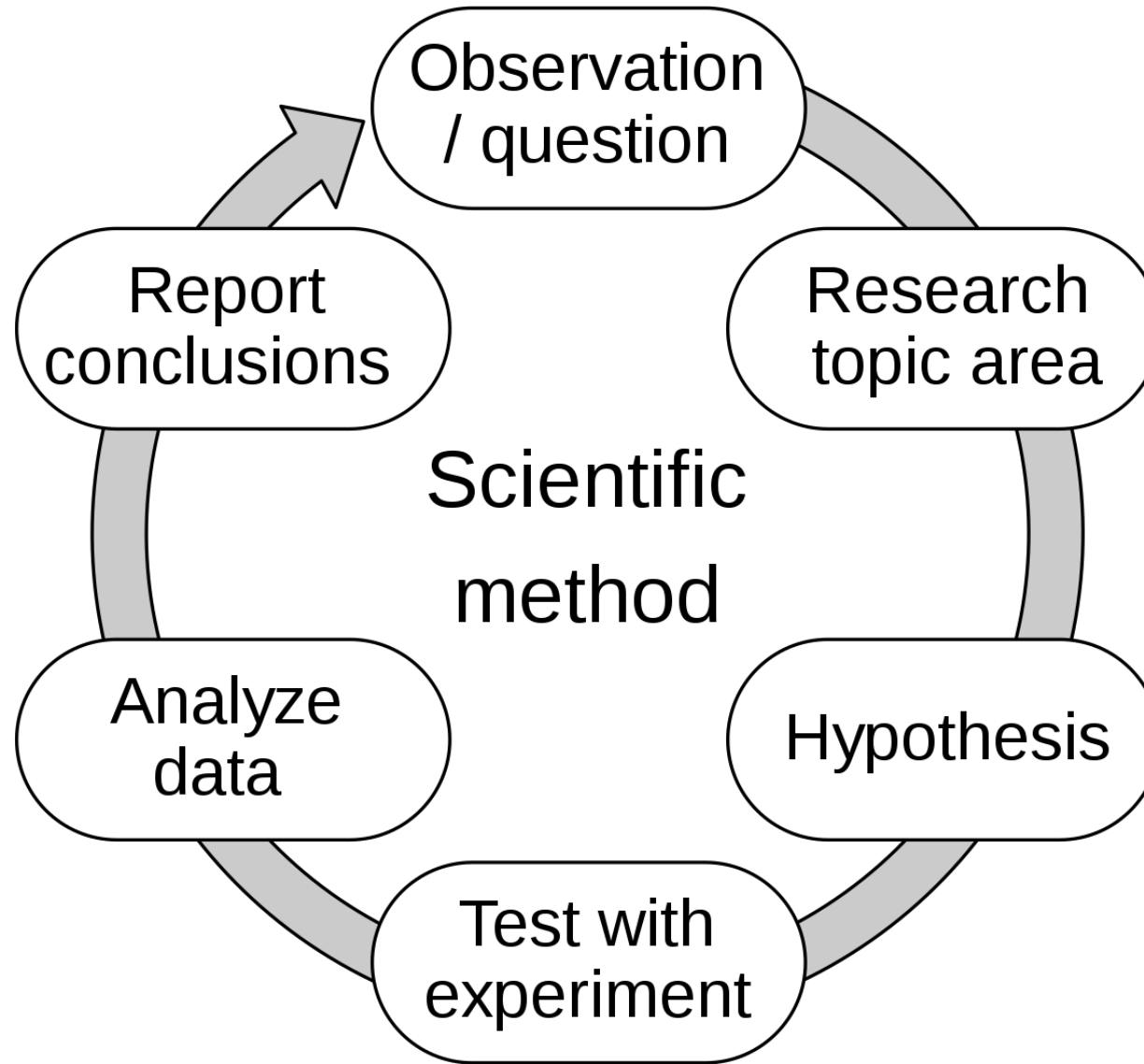
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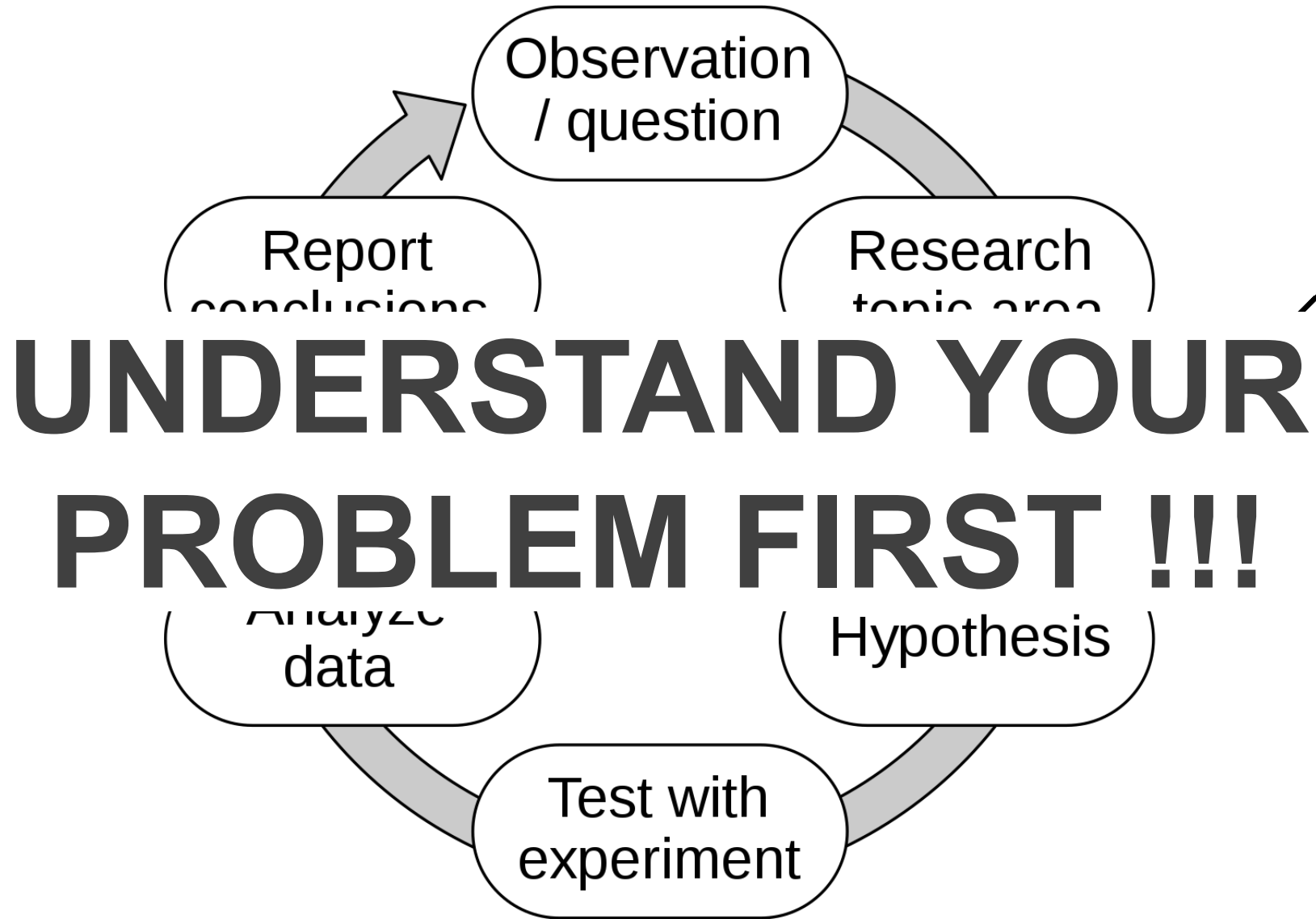
改善

Lean

=

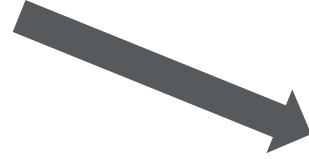
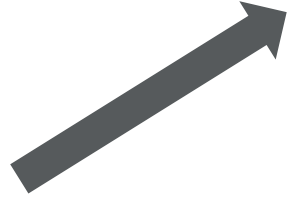








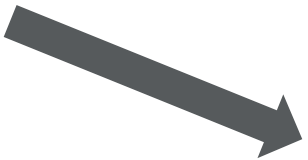
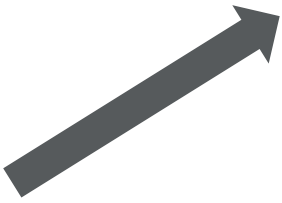
Sense a problem



No improvement



Sense a problem





Sense a problem



Sustained improvement







Agency for Healthcare  
Research and Quality

Order and Order Set Search

DELIRIUM

[Browse](#) [Preference List](#) [Facility List](#)

**Order Sets & Panels**

| Name   | User Version Name | Type      |
|--|-------------------|-----------|
| <input type="checkbox"/> <input type="checkbox"/> UCHS IP Delirium Assessment and Management |                   | Order Set |

## Outcomes Following Implementation of a Hospital-Wide, Multicomponent Delirium Care Pathway

TABLE 3. **Unadjusted and Adjusted Clinical Outcomes for All Patients Combined and Medicine Unit Patients**

| Clinical outcome                                   | Unadjusted model result (95% CI) | P value | Adjusted model result (95% CI) | P value |
|--|----------------------------------|---------|--------------------------------|---------|
| All patients                                       |                                  |         |                                |         |
| Length of stay proportional change <sup>a</sup>    | 1.00 (0.97-1.05)                 | .65     | 0.98 (0.92-0.99)               | .0087   |
| Total direct cost proportional change <sup>a</sup> | 0.98 (0.96-1.00)                 | .17     | 0.99 (0.97-1.01)               | .12     |
| 30-Day hospital readmission odds ratio             | 0.93 (0.86-1.00)                 | .039    | 0.86 (0.80-0.93)               | .0002   |
| Restraint rate ratio                               | 0.83 (0.76-0.91)                 | <.0001  | 0.91 (0.71-1.16)               | .45     |
| Safety attendant rate ratio                        | 0.51 (0.48-0.54)                 | <.0001  | 0.63 (0.41-0.97)               | .034    |



Sense a problem



Sustained improvement



# Six Steps for a Successful QI Project

1. Define the problem.
2. Identify areas that can be improved.
3. Decide how you will measure progress.
4. Explicitly state your goals (SMART)
5. Implement and measure small tests of change.
6. Build upon success and sustain the process.



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Understand your  
problem



# Six Steps for a Successful QI Project

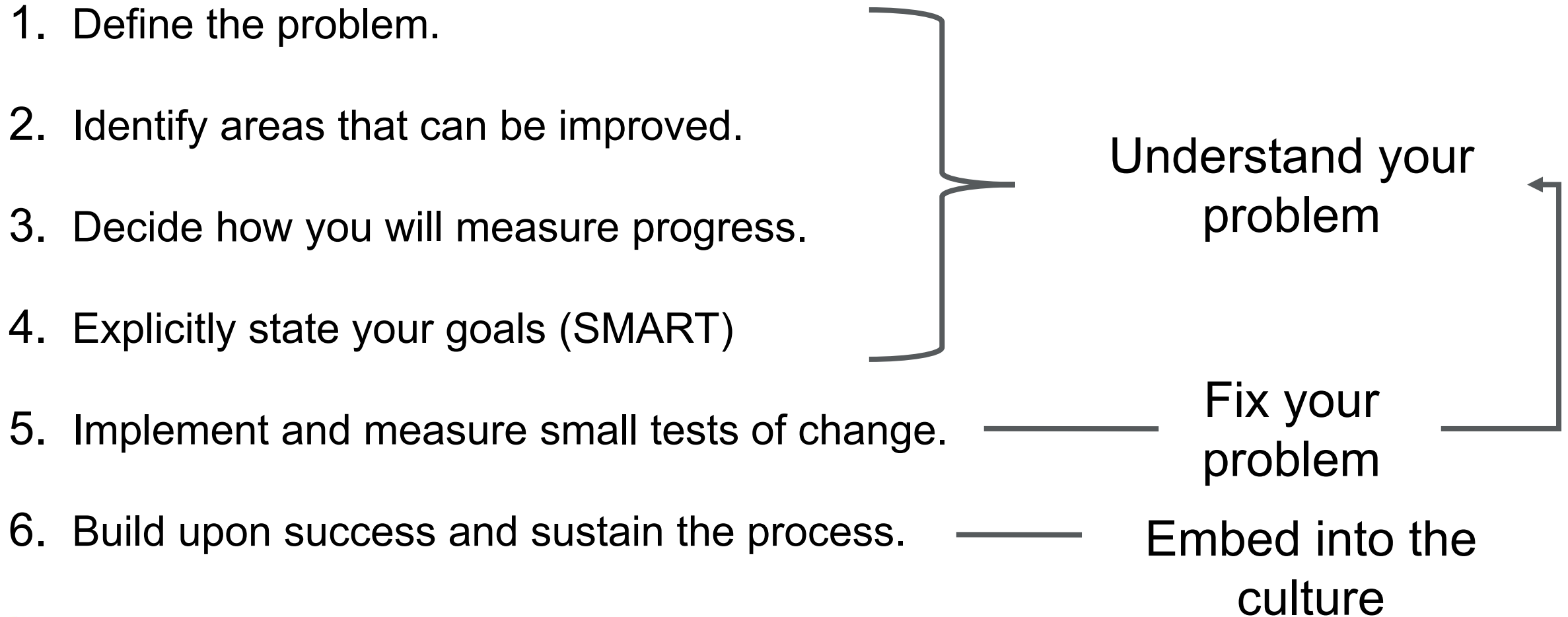
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Understand your  
problem

Fix your  
problem



# Six Steps for a Successful QI Project





George: 69-Year-old man presents with acute onset chest pain.





69-Year-old man presents with acute onset chest pain.

**HD 0:** presents with STEMI

Taken emergently to cath lab – **stent placed to LAD**

**HD 2:** started on **diuretics**

**HD 5:** discharged home on **5 new medications**

Instructed to **“follow-up”** with Cardiology

**2 weeks later:** found down at home suffering **cardiac arrest.**

**Prolonged hospitalization** but eventually discharged to SNF for rehab therapy.

**HD 1:** Echo reveals **reduced ejection fraction of 35%**

**HD 4:** **doing-well**, preparing for hospital discharge

**On admission:** critical hypokalemia to **1.8**

# Six Steps for a Successful QI Project

**1. Define the problem.**

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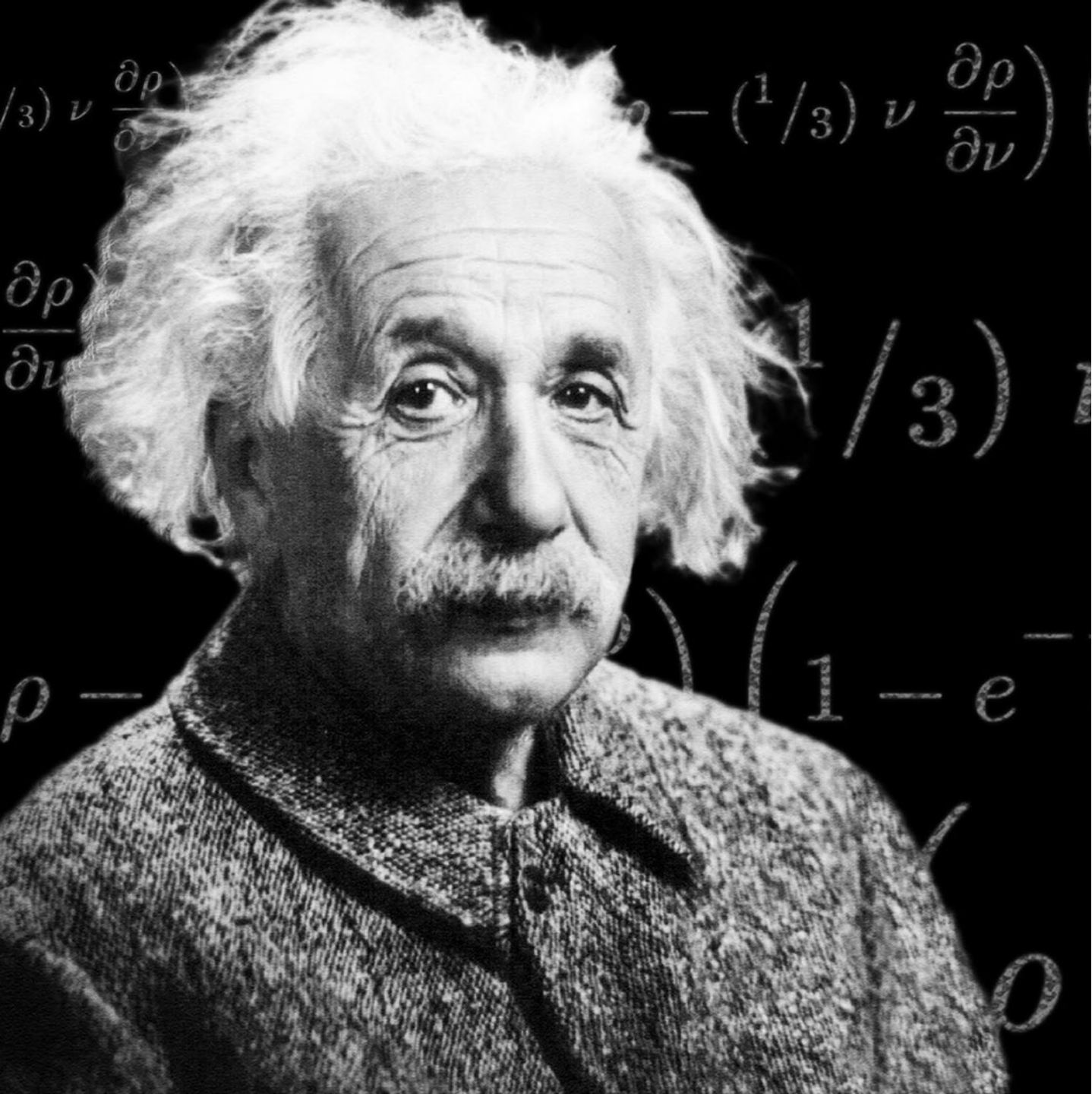
5. Implement and measure small tests of change.

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Understand your  
problem





“If I had an hour to solve a problem, I'd spend 55 minutes thinking about the problem and five minutes thinking about solutions.”

# 1. Define the problem.



Who is affected? By how much?

Are there guidelines to refer to?



# 1. Define the problem.

Frequency: Count, Percent, Frequency

Vaccination rates

CAUTIs

Wrong-site surgeries

Central Tendency: Mean, Median, and Mode

Mean and median length-of-stay

Dispersion/Variation: Range, Variance, Std. Deviation

a1c measures in a clinic population, amount of blood loss after surgery

Position: Percentile Ranks, Quartile Ranks

vizient.



# 1. Define the problem.

Frequency: Count, Percent, Frequency

Vaccination rates

CAUTIs

Wrong-site surgeries

Central Tendency: Mean, Median, and Mode

Mean and median

## AKA Baseline data!

Dispersion/Variation: Range, Variance, Std. Deviation

a1c measures in a clinic population, amount of blood loss after surgery

Position: Percentile Ranks, Quartile Ranks

vizient.



# 1. Define the problem.

Consider the heterogeneity of your population....  
**Are some groups affected differently than others?**

Patients with HbA1c > 8% are more likely to experience complications and comorbidities. At X clinic...

**35% of ALL patients** with diabetes are not under glycemic control as defined by an A1c < 8%.

**40% of Hispanic and Latino patients** with diabetes have not achieved glycemic control.





It is recommended that patients who suffered an acute myocardial infarction (MI) have follow up in 7-days.

Society of Hospital Medicine (SHM) ACS Discharge & Transitions Workgroup

- In the past 4 months, 1/38 (2%) patients with MI were scheduled and seen within one week of discharge.
- The average duration of time from discharge to first appointment is 18.9 days.

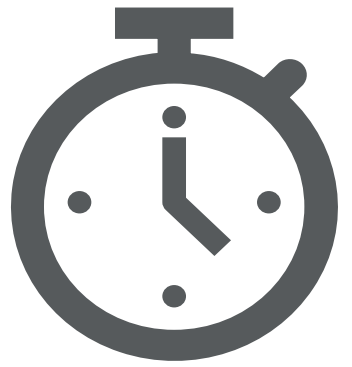






## Breakout #1

- Introductions
- Your problem/project
- How do you know it's a problem? (IE: "Define")



**15 minutes**



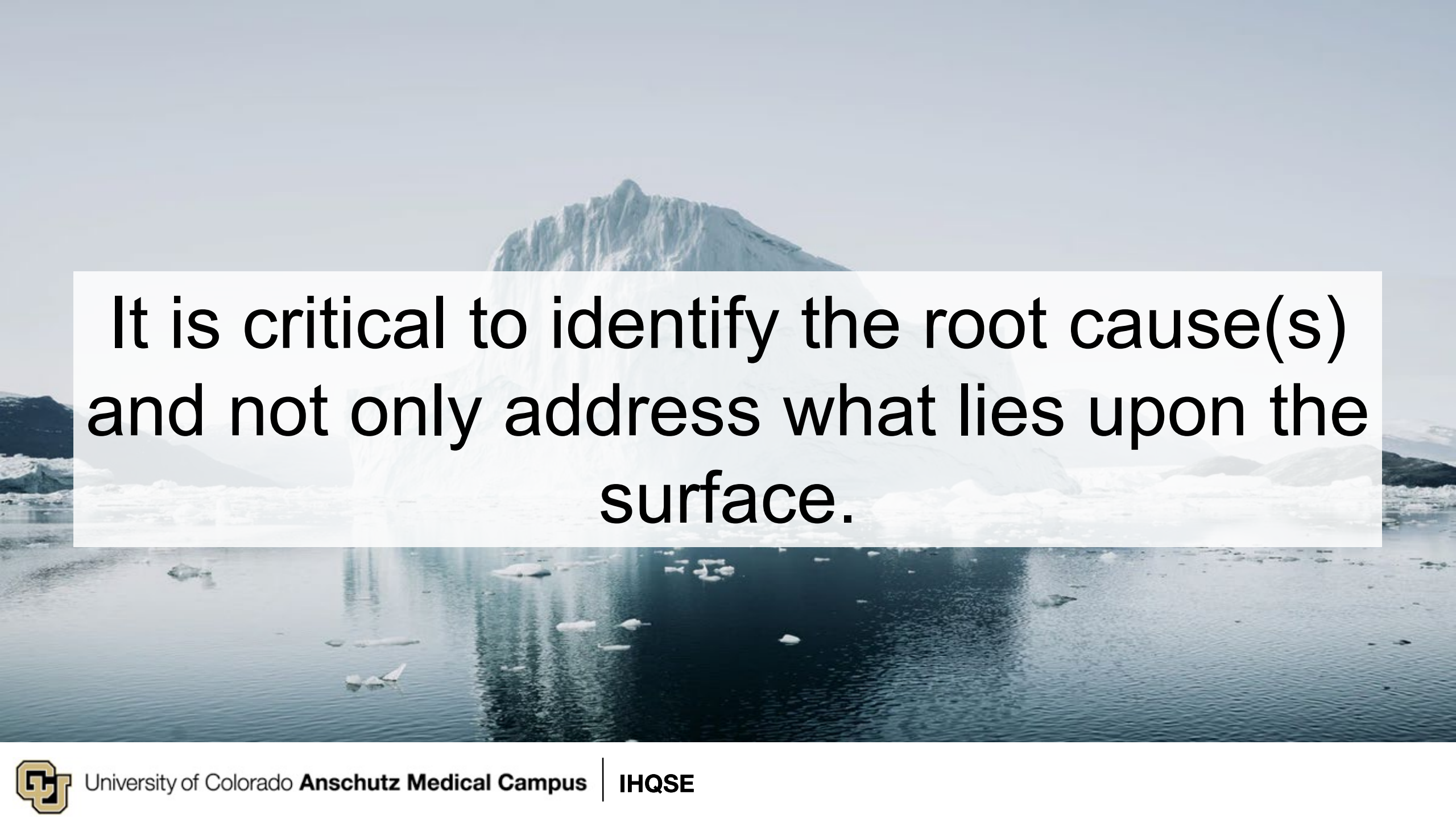
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Understand your  
problem



A scenic view of a mountain peak reflected in a body of water with icebergs. The mountain is in the background, and the water in the foreground is filled with numerous icebergs of various sizes. The sky is a pale, clear blue.

It is critical to identify the root cause(s)  
and not only address what lies upon the  
surface.



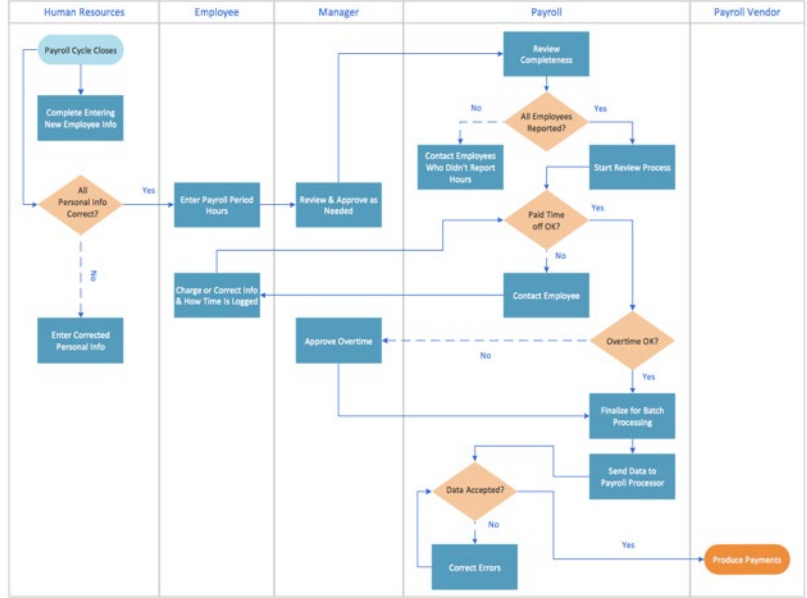
# Gemba 現場



Go See.  
Ask Why?  
Show Respect.

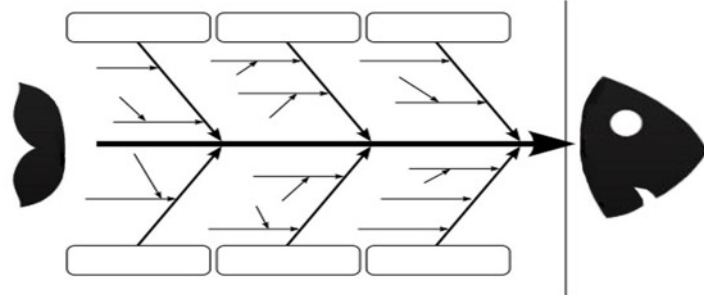


# QI Tools



Causes

Effect



2. Identify areas that can be improved.



# Gemba 現場



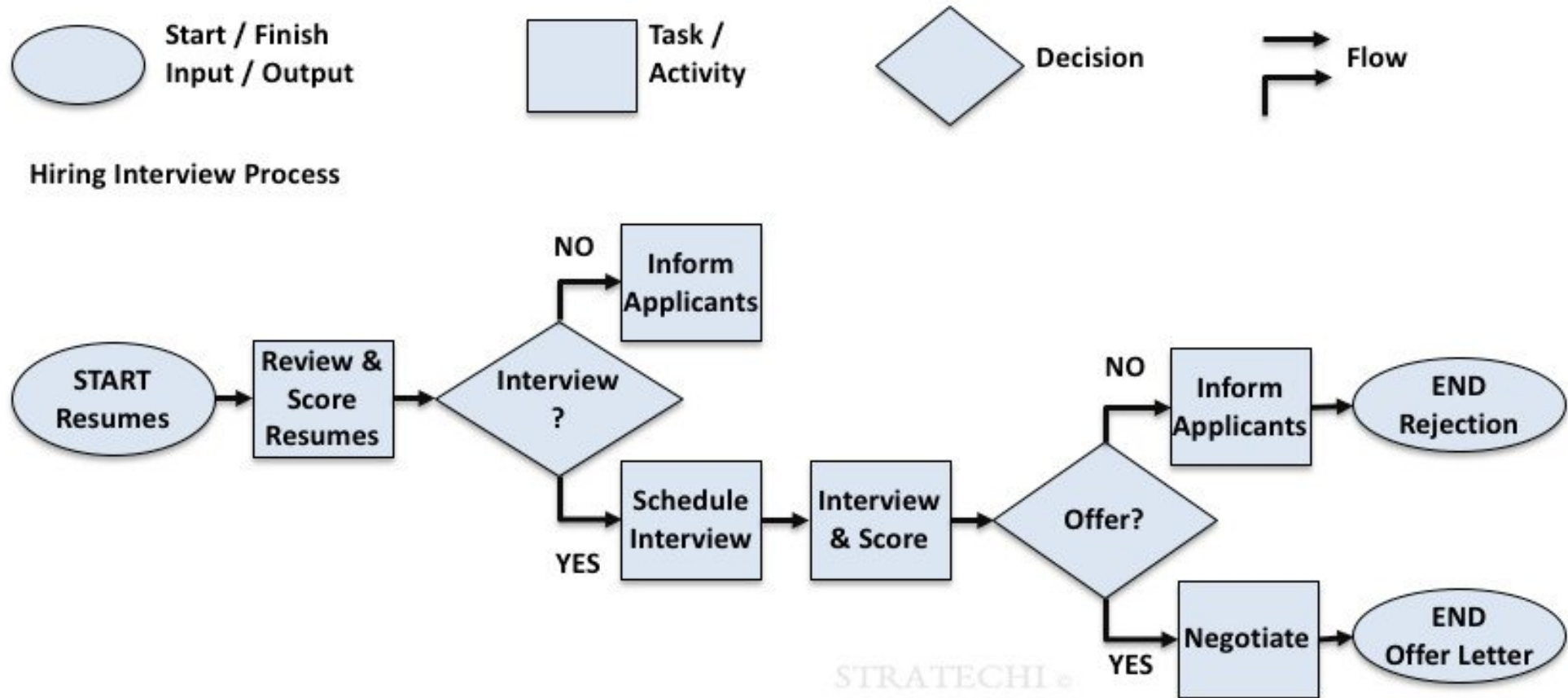
Go See.  
Ask Why?  
Show Respect.



## 2. Identify areas that can be improved.



# Process Map

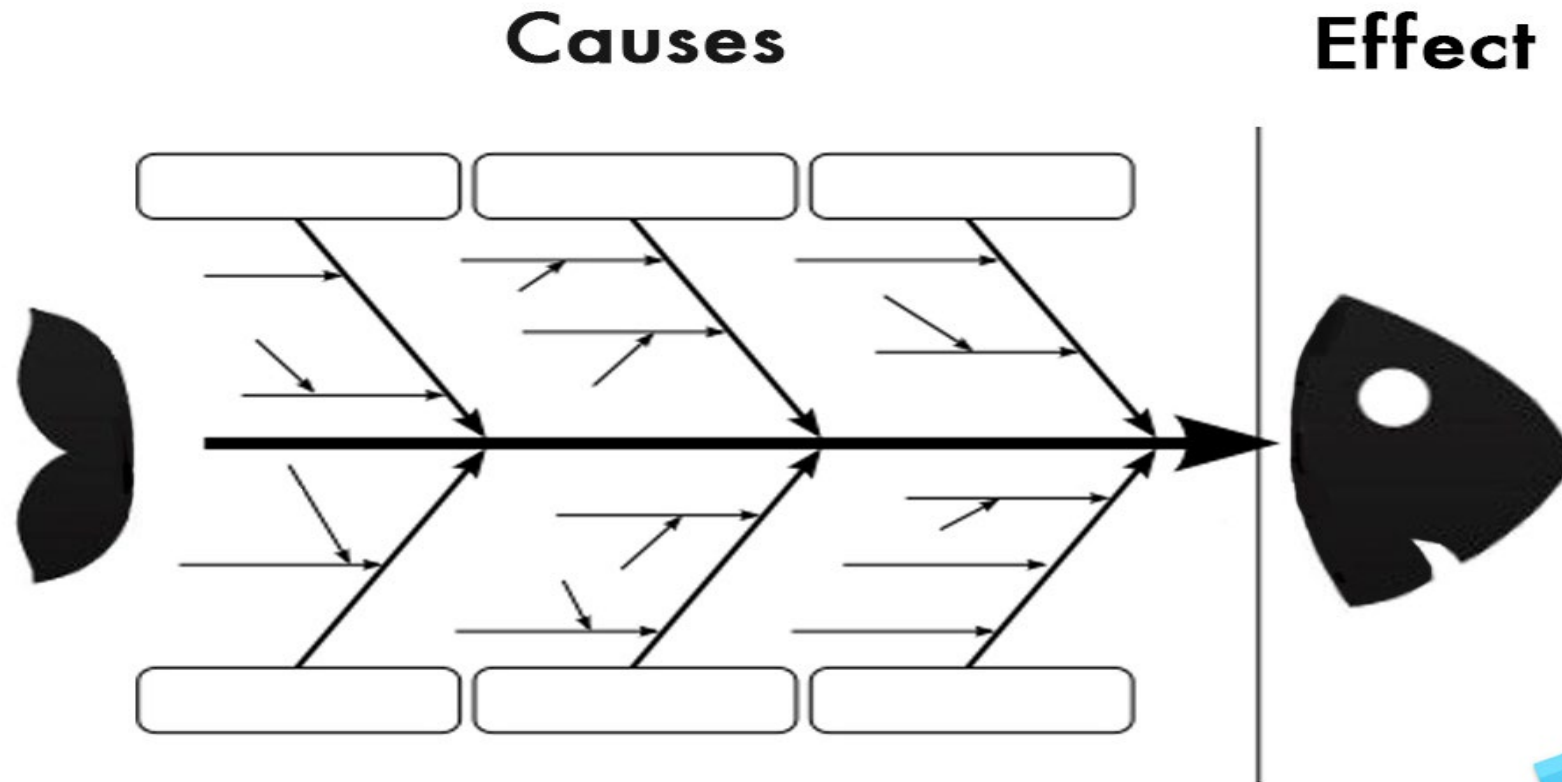


STRATECHI

2. Identify areas that can be improved.



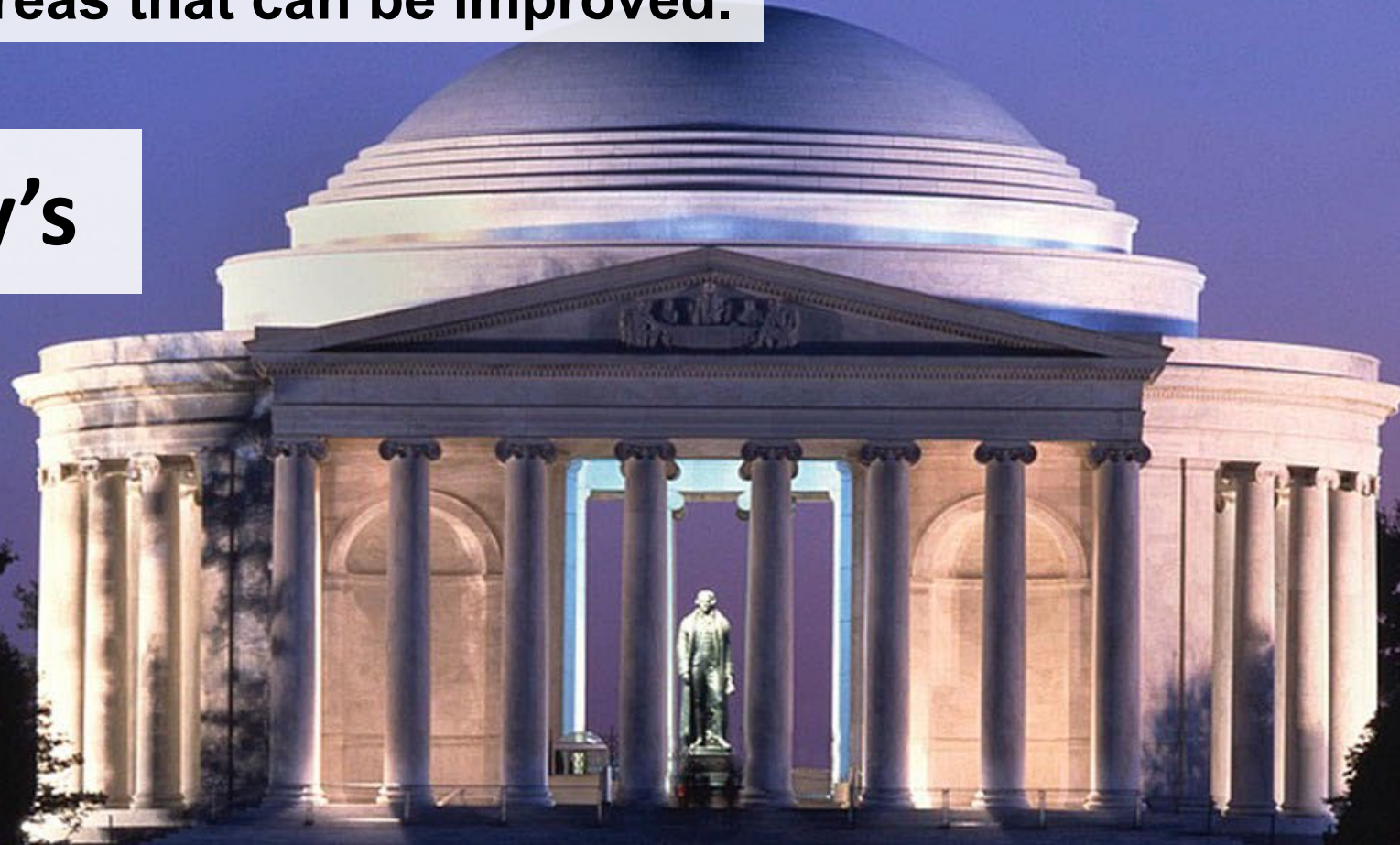
# Fishbone “Ishikawa” Diagram



2. Identify areas that can be improved.



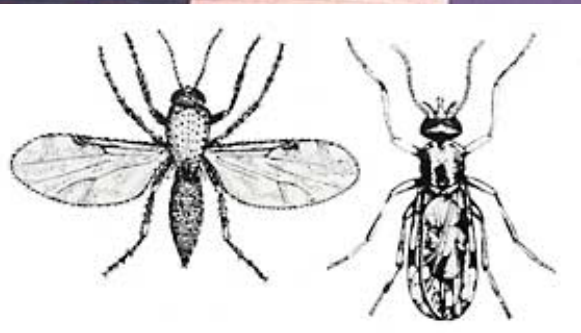
## Five Why's





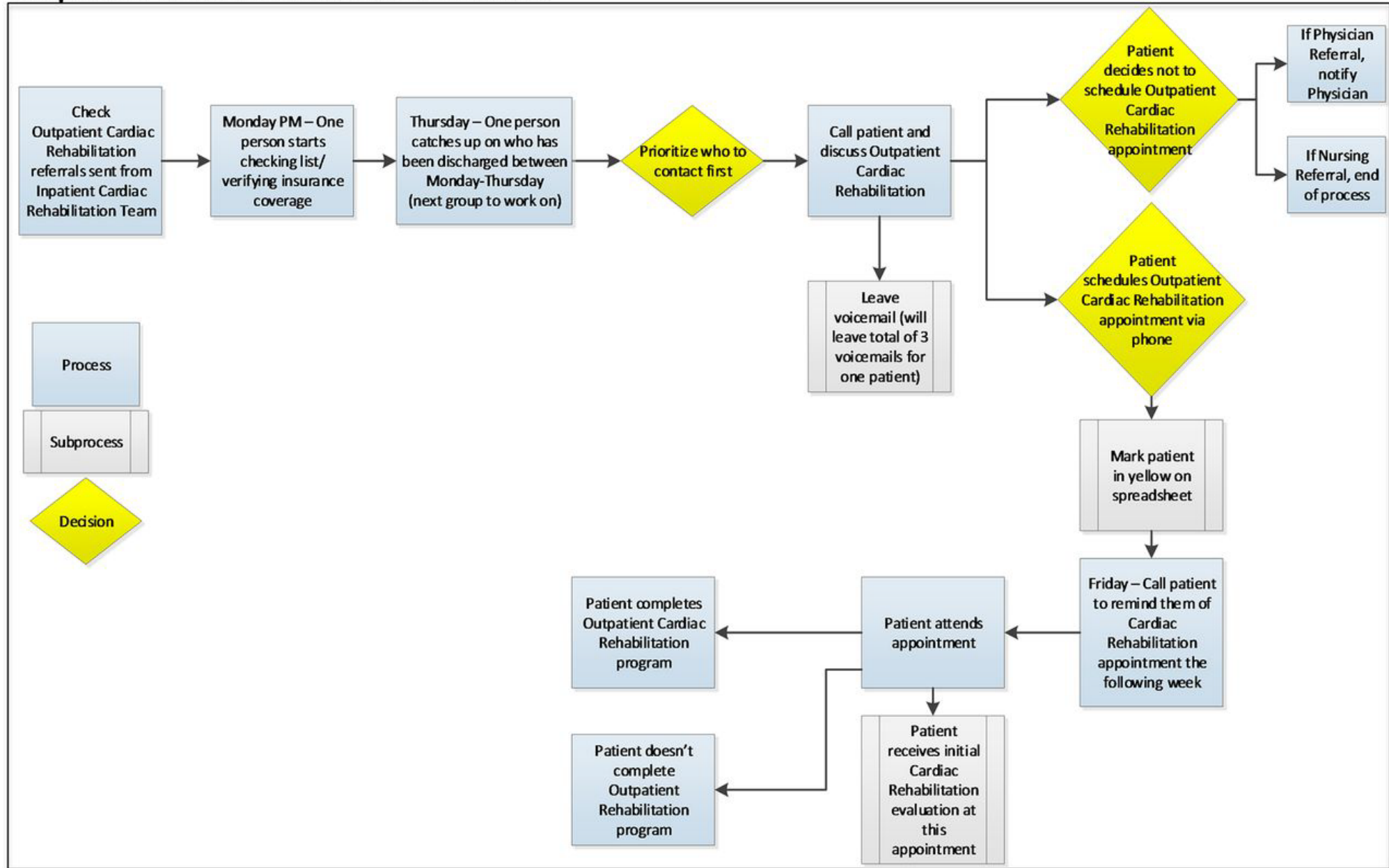


# Five Why's

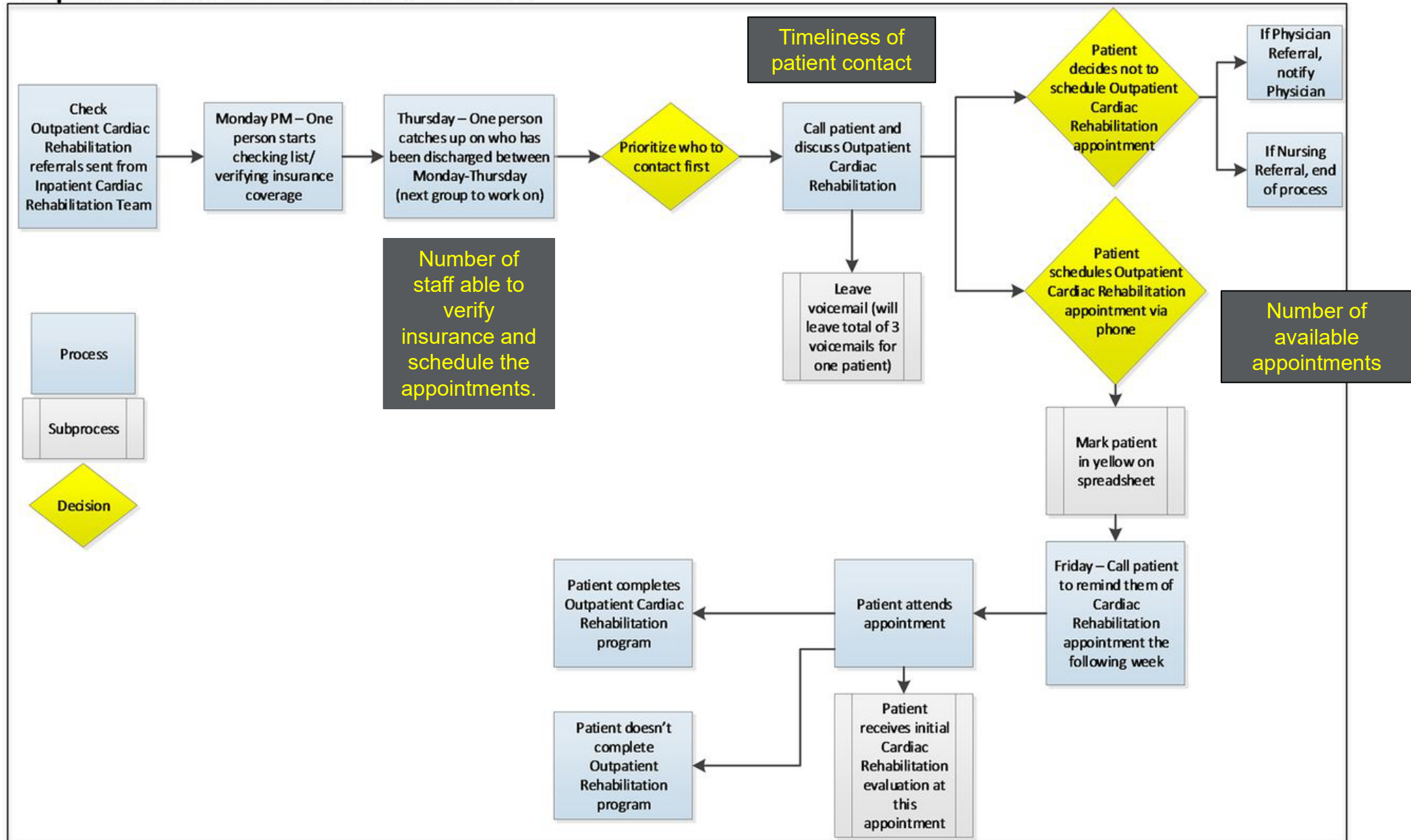


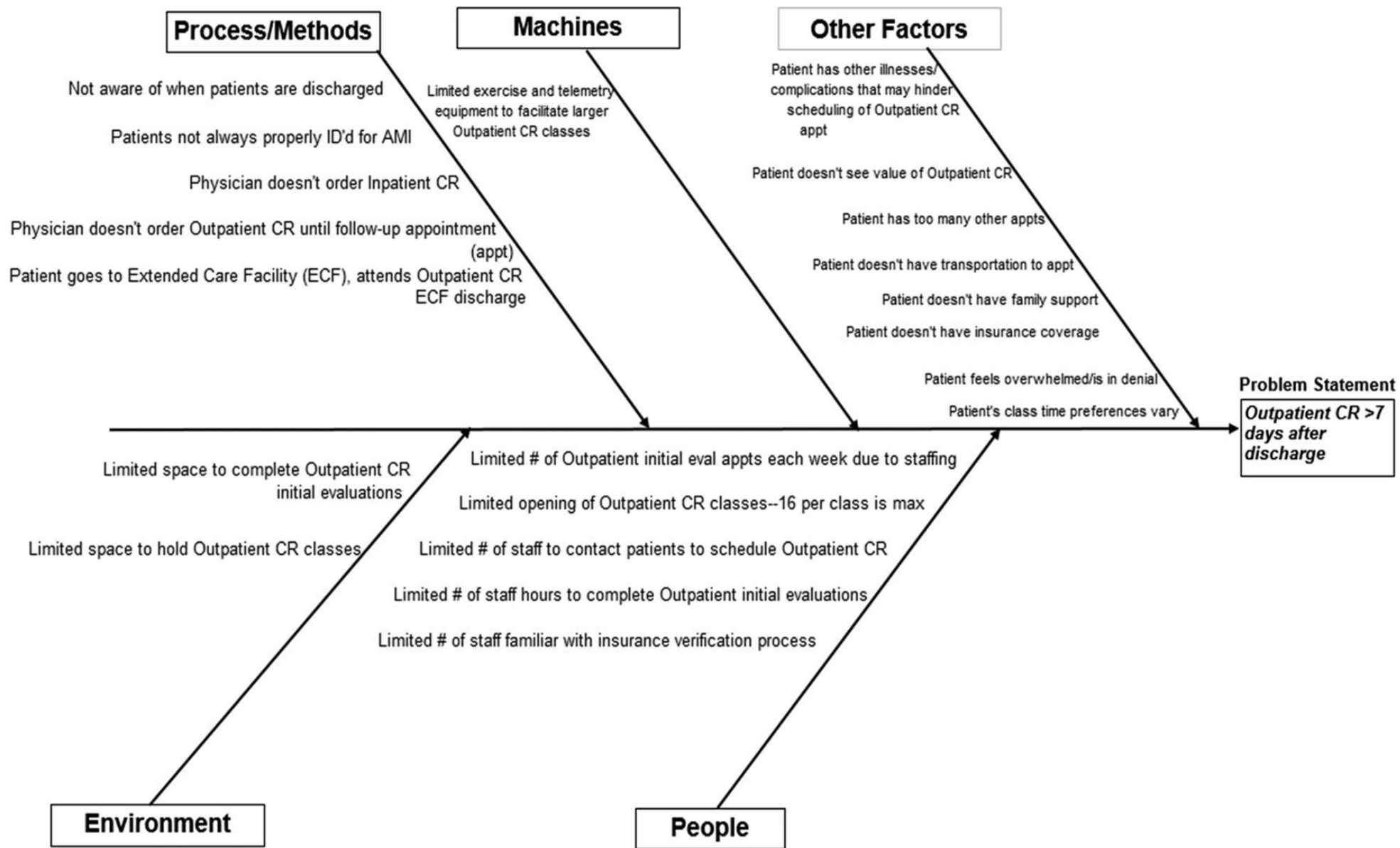


# Outpatient Cardiac Rehabilitation Process



# Outpatient Cardiac Rehabilitation Process







## Breakout #2



**10 minutes**

- 5-Why's for YOUR Project/Problem

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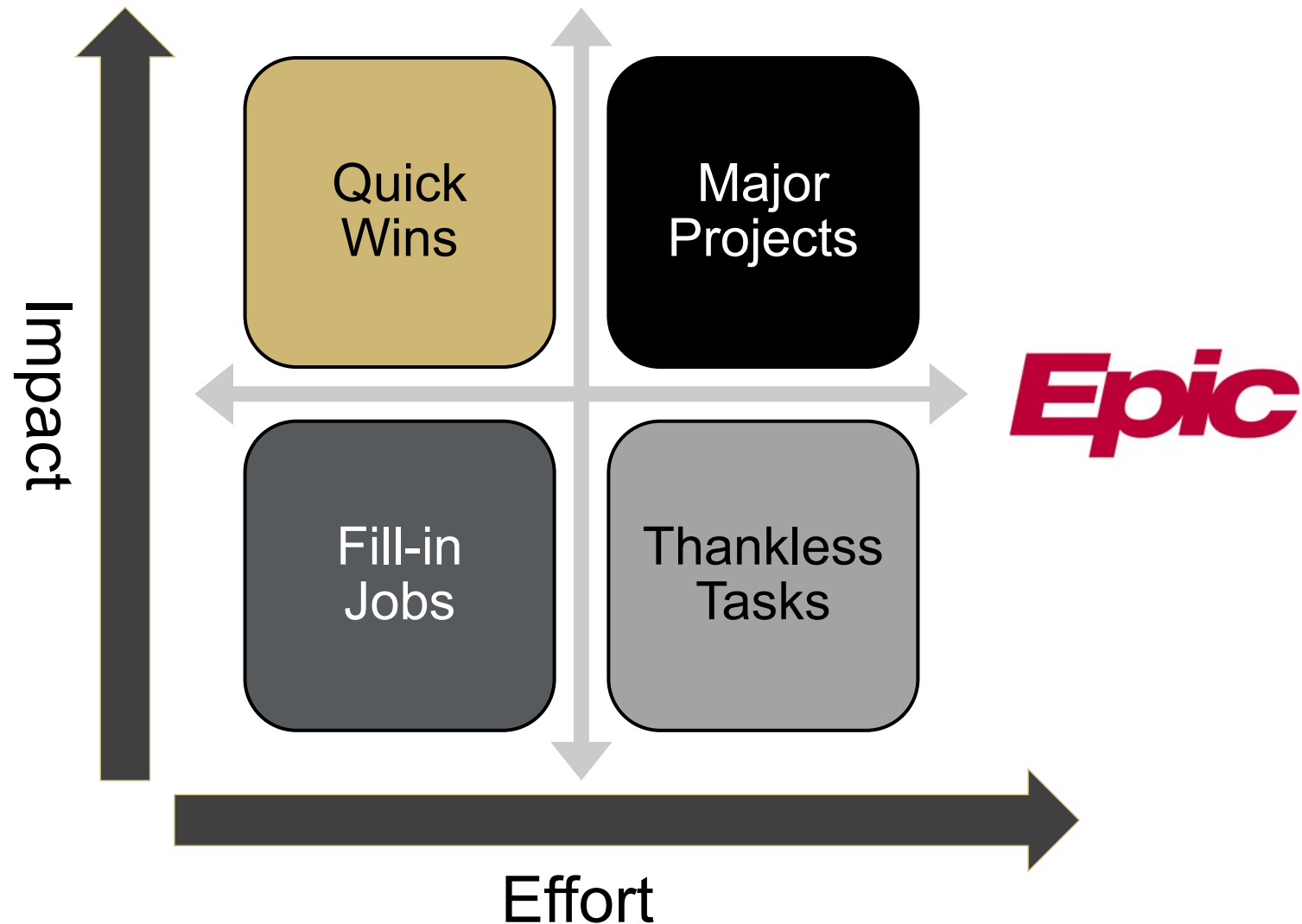
Understand your  
problem



## 2. Identify areas that can be improved.



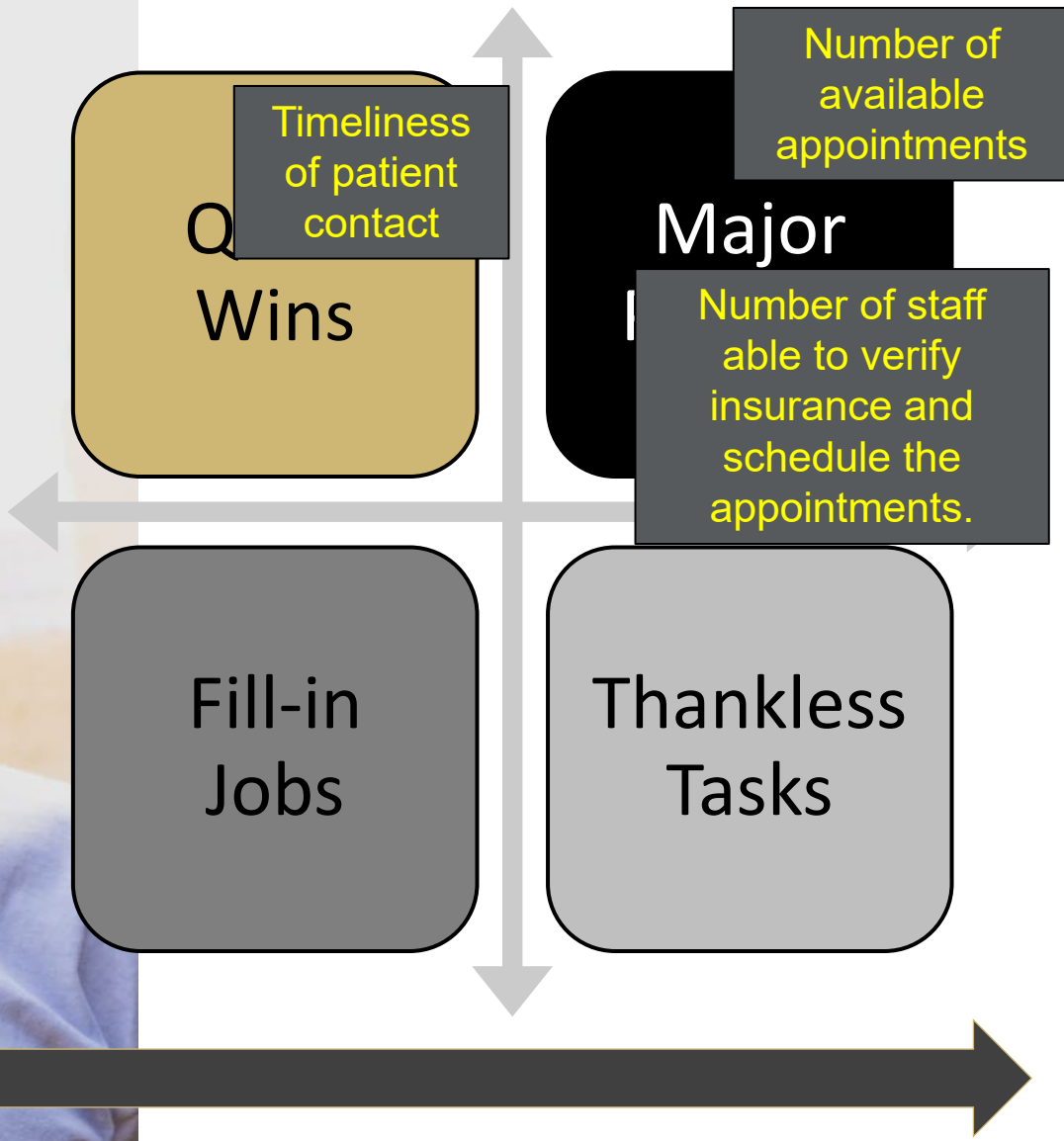
### Action Priority Matrix







**Impact**



**Effort**

# Six Steps for a Successful QI Project

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Understand your  
problem



Matter to Patients

## OUTCOME

- Patient Satisfaction
- LOS
- Readmission Rate
- Throughput
- Adverse Events

Can act as proxy for outcomes

## PROCESS

- Use of checklists
- Patient Centered Rounds
- Lab orders

## STRUCTURE

- Order Sets
- Regionalized
- Nurse:Patient ratio
- Discharge navigators

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BALANCE

Dependent on intervention

Consider health equity.



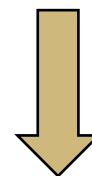
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Dependent  
on  
intervention

**Consider  
health  
equity.**

Experience shows that traditional QI methods can maintain or worsen health inequities across subpopulations.



Look at disparities and solutions upfront among commonly disadvantaged subgroups such as wealth, race, and location.





# Inpatient DVT Prophylaxis



## OUTCOME

- DVT rates
- PE rates
- Mortality

## PROCESS

- Use of SCDs
- Use of Rx prophylaxis
- Risk scoring

## STRUCTURE

- Anti-coagulants stock
- RNs to administer

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Bleeding  
Rate



Focus on the process, not the results. Take one step at a time. You don't climb a mountain by simply looking at the top.





## OUTCOME

- Readmission rate
- 30/60/90-day mortality

## PROCESS

- Outpatient appt. w/in 7 days of discharge
- Number of patients contacted
- Referrals placed before d/c

## STRUCTURE

- Number of appointments
- Number of staff trained to verify insurance





# Six Steps for a Successful QI Project

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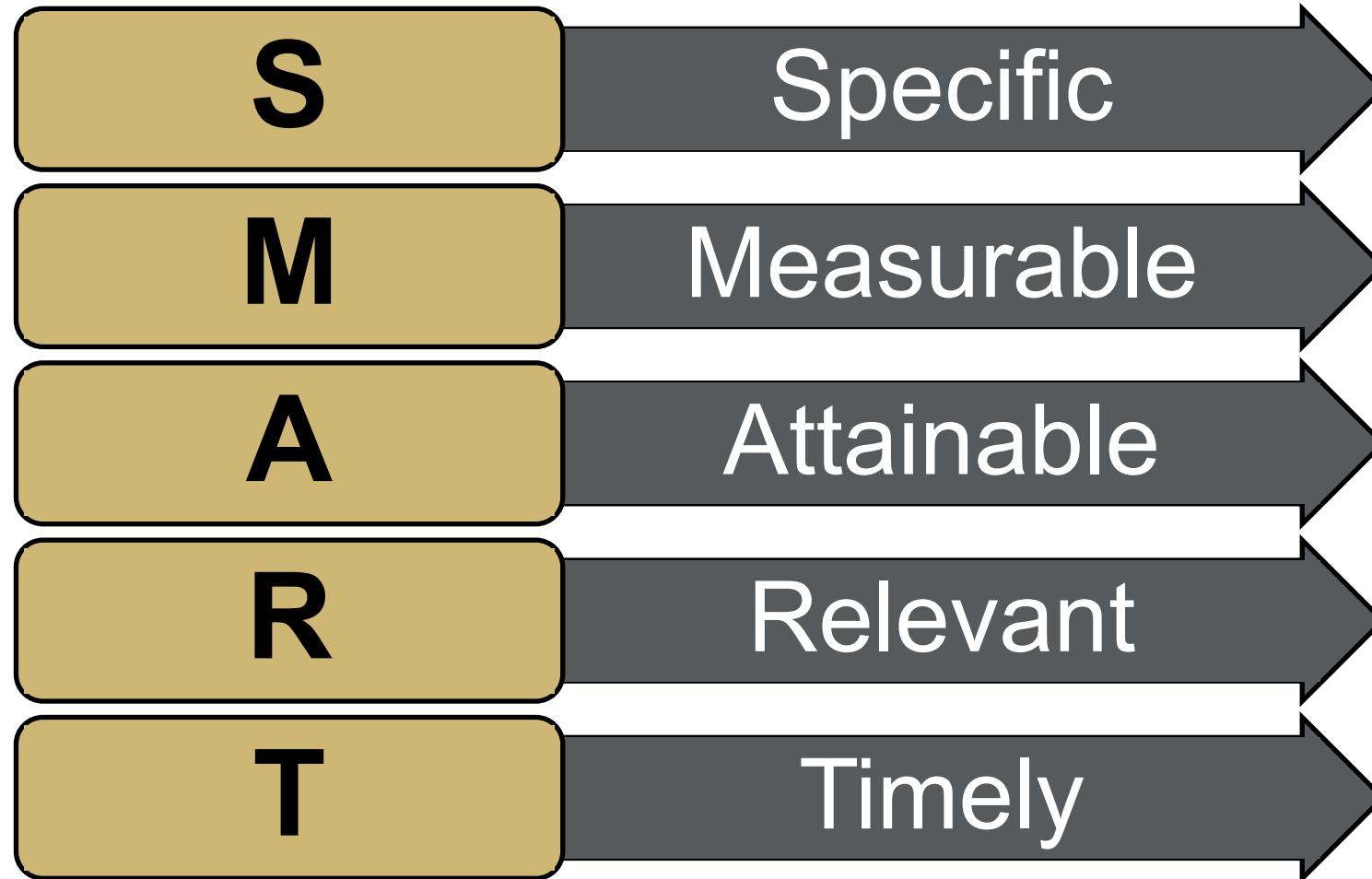
Understand your  
problem




## 4. Explicitly state your goals



### Aim Statement

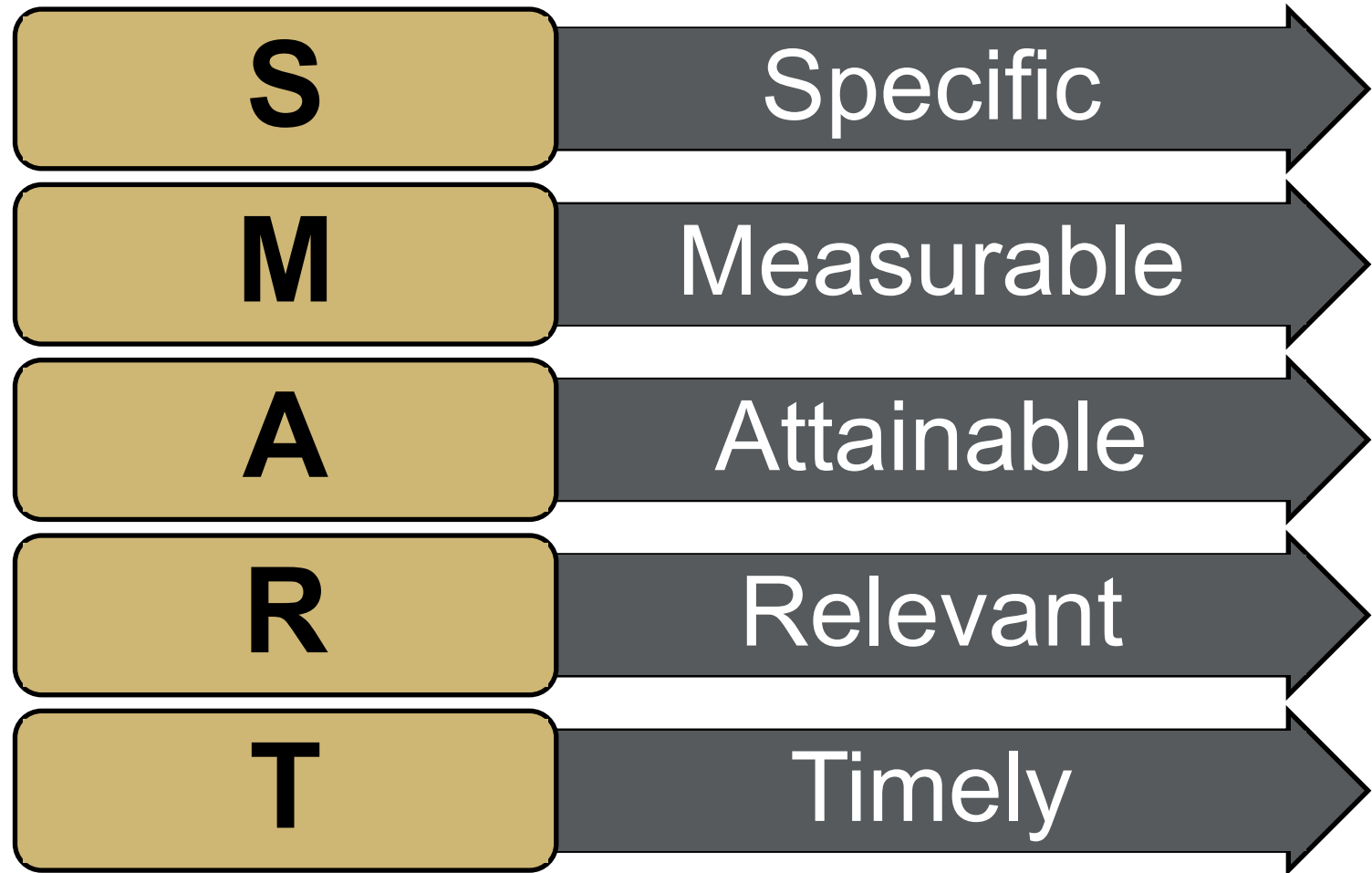


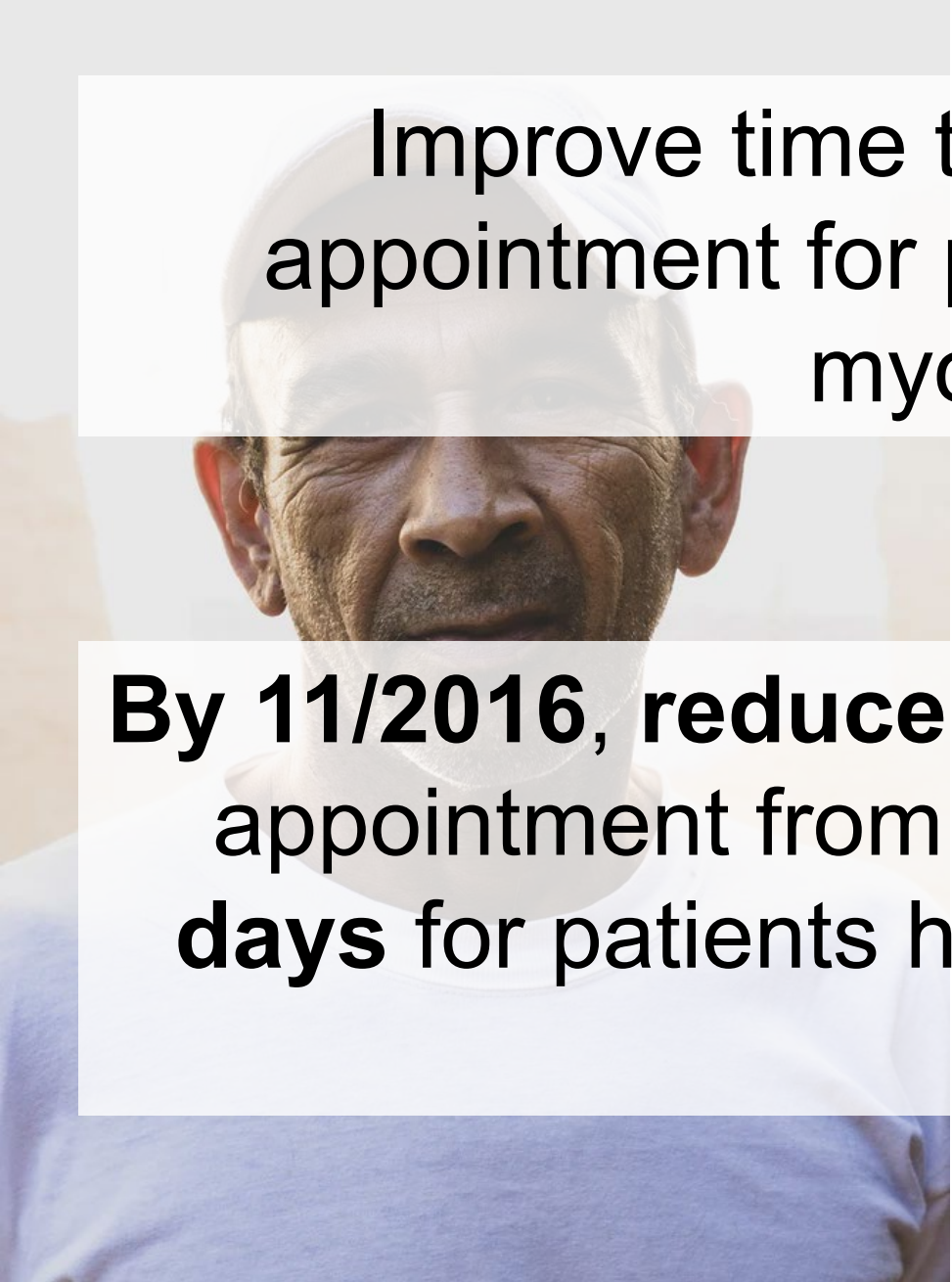
**“I want to be a better skier.”**

A black and white photograph of a skier in a white jacket and helmet, leaning into a turn on a snowy slope. The skier is wearing goggles and has their skis angled. The background shows a vast, snow-covered mountain range under a clear sky.

**“By the end of the 21/22 season, I will be able to make it down a double-black diamond slope without falling.”**







Improve time to initial cardiac rehabilitation appointment for patients hospitalized with acute myocardial infarction.

**By 11/2016, reduce time** to initial cardiac rehabilitation appointment from an **average of 18.9 days to < 7 days** for patients hospitalized with acute myocardial infarction.



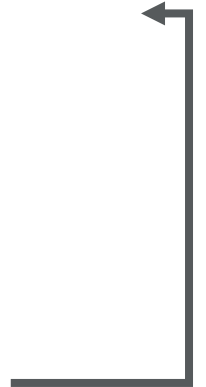
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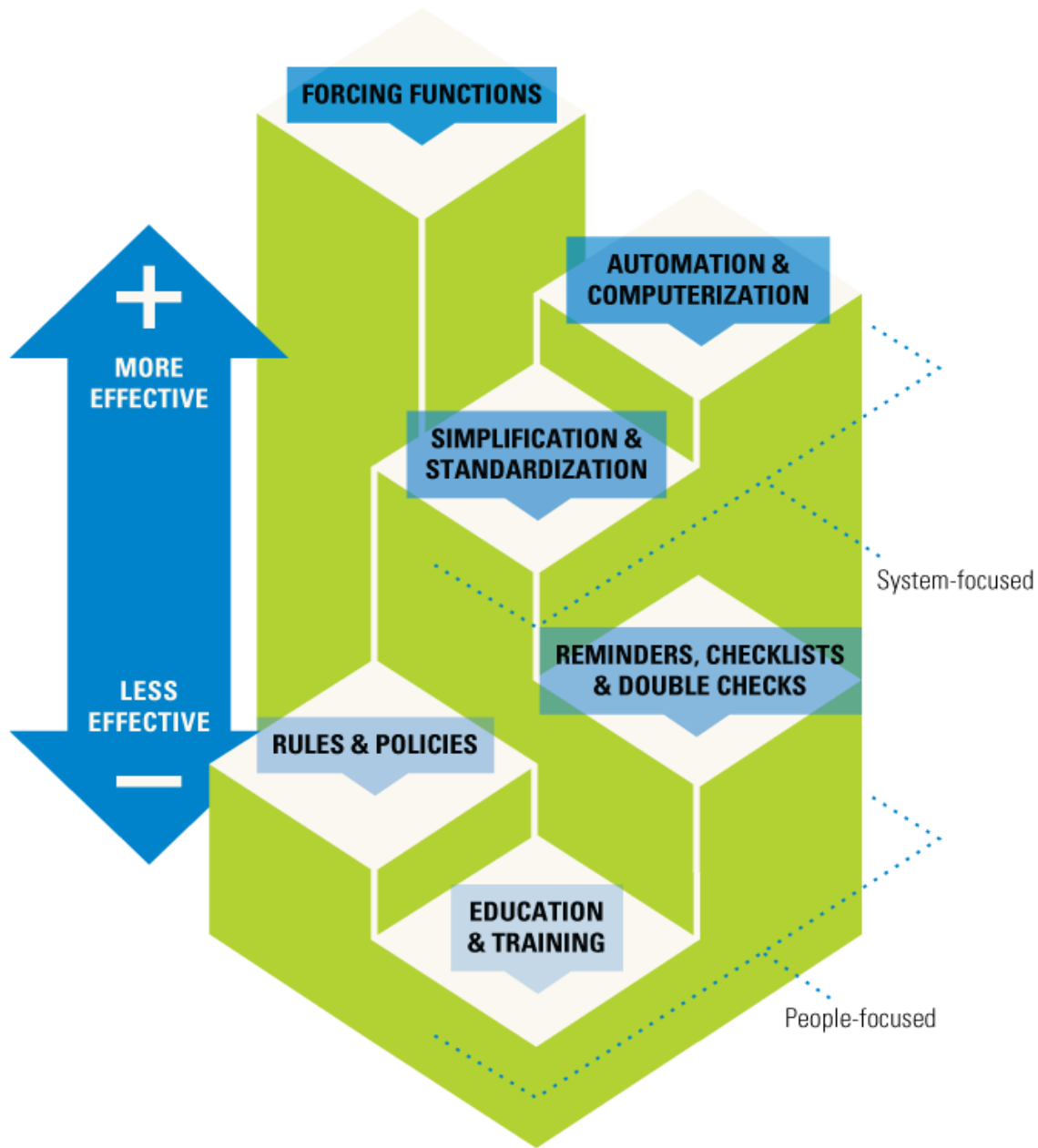
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Understand your  
problem

Fix your  
problem





✓ Please order contact precautions (BPA# 1183)

- Contact precautions until result is negative, if result is positive precautions will continue for duration of therapy.
- Please refer to Gastroenteritis table on the [Infection Control](#) page on The Source for more information.
- If you have questions regarding isolation precautions, please contact Infection Control at 720-848-6978.

Order    Do Not Order    Special contact isolation status

Acknowledge Reason

Isolation not required    Deferred at this time

### WHO Surgical Safety Checklist

(adapted for England and Wales)

NHFS  
National Patient Safety Agency  
National Reporting and Learning Service

| SIGN IN (To be read out loud)<br><small>Before induction of anaesthesia</small>  | TIME OUT (To be read out loud)<br><small>Before start of surgical intervention<br/>for example, skin incision</small>   | SIGN OUT (To be read out loud)<br><small>Before any member of the team leaves<br/>the operating room</small>   |
|--|---|--|
| <p>Has the patient confirmed his/her identity, site, procedure and consent?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>Is the surgical site marked?</p> <p><input type="checkbox"/> Yes/not applicable</p> <p><input type="checkbox"/> No</p> <p>Is the anaesthesia machine and medication check complete?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>Does the patient have a:</p> <p>Known allergy?</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p> <p>Difficult airway/intubation risk?</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes, and equipment/assistance available</p> <p>Risk of &gt;500ml blood loss (7ml/kg in children)?</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes, and adequate IV access/flush planned</p> | <p>Have all team members introduced themselves by name and role?</p> <p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>Surgeon, Anaesthetist and Registered Practitioner verbally confirm:</p> <p><input type="checkbox"/> What is the patient's name?</p> <p><input type="checkbox"/> What procedure, site and position are planned?</p> <p>Anticipated critical events</p> <p>Surgeon:</p> <p><input type="checkbox"/> How much blood loss is anticipated?</p> <p><input type="checkbox"/> Are there any specific equipment requirements or special investigations?</p> <p><input type="checkbox"/> Are there any critical or unexpected steps you want the team to know about?</p> <p>Anaesthetist:</p> <p><input type="checkbox"/> Are there any patient specific concerns?</p> <p><input type="checkbox"/> What is the patient's ASA grade?</p> <p><input type="checkbox"/> What monitoring equipment and other specific levels of support are required, for example blood?</p> <p>Nurses/ODP:</p> <p><input type="checkbox"/> Has the sterility of the instrumentation been confirmed (including indicator results)?</p> <p><input type="checkbox"/> Are there any equipment issues or concerns?</p> <p>Has the surgical site infection (SSI) bundle been undertaken?</p> | <p>Registered Practitioner verbally confirms with the team:</p> <p><input type="checkbox"/> Has the name of the procedure been recorded?</p> <p><input type="checkbox"/> Has it been confirmed that instruments, sponges and sharp counts are complete (or not applicable) (including patient name)?</p> <p><input type="checkbox"/> Have the specimens been labelled?</p> <p><input type="checkbox"/> Have any equipment problems been identified that need to be addressed?</p> <p>Surgeon, Anaesthetist and Registered Practitioner:</p> <p><input type="checkbox"/> What are the key concerns for recovery and management of this patient?</p> |

This checklist contains the core content for England and Wales



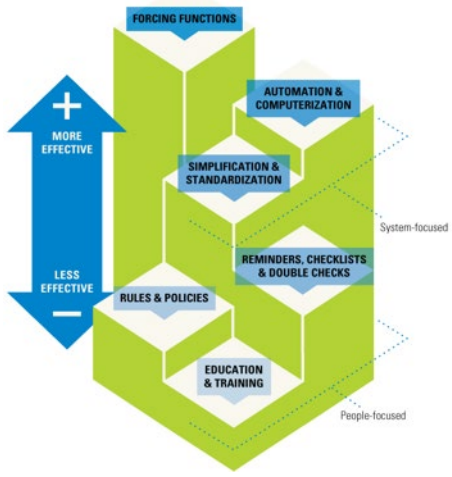
# Education as a low-value improvement intervention: often necessary but rarely sufficient

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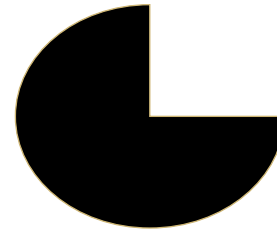
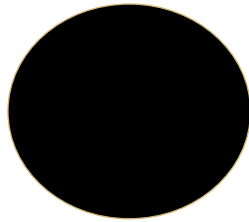
Christine Soong <sup>1</sup>, Kaveh G Shojania<sup>2</sup>



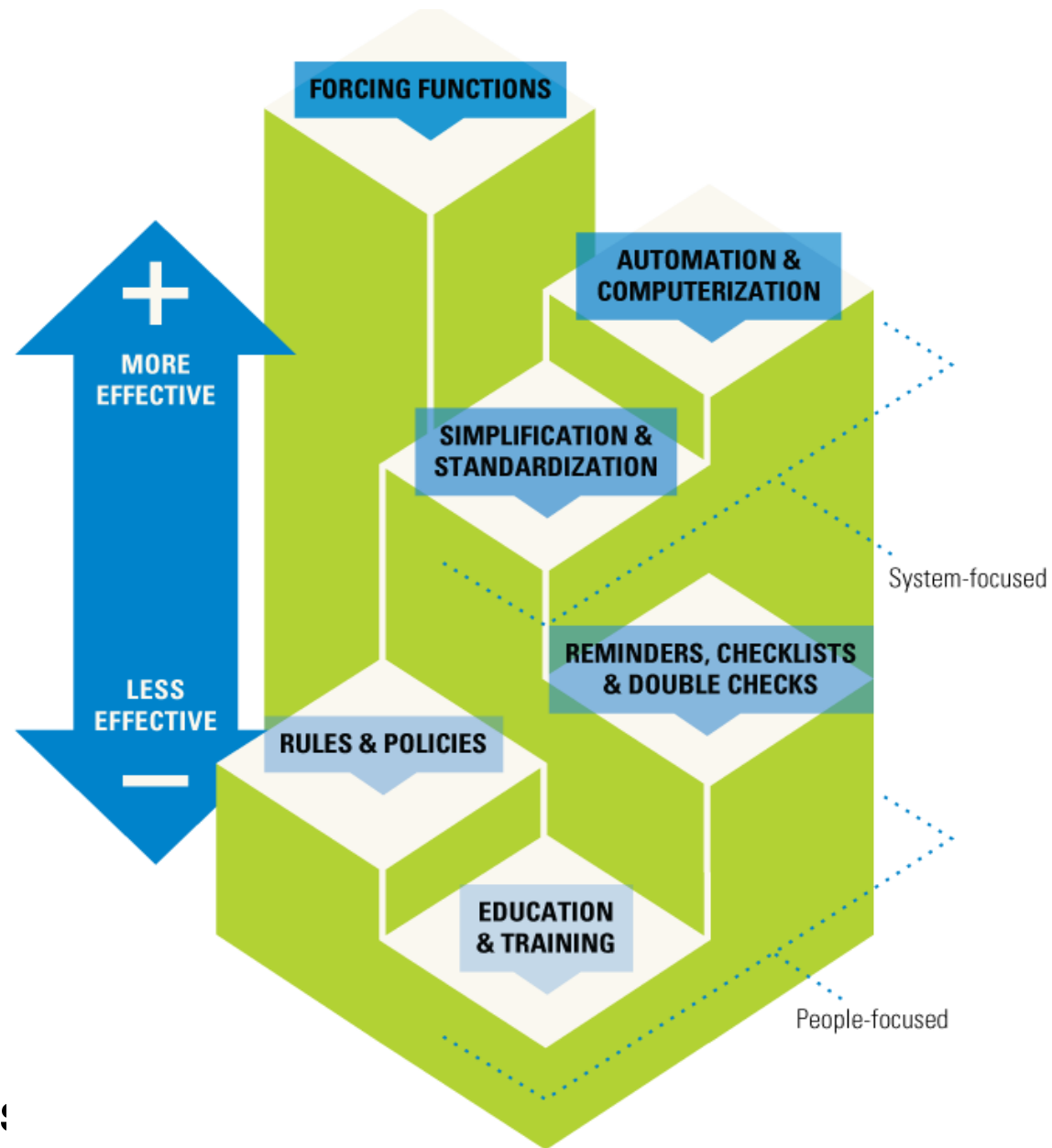




?





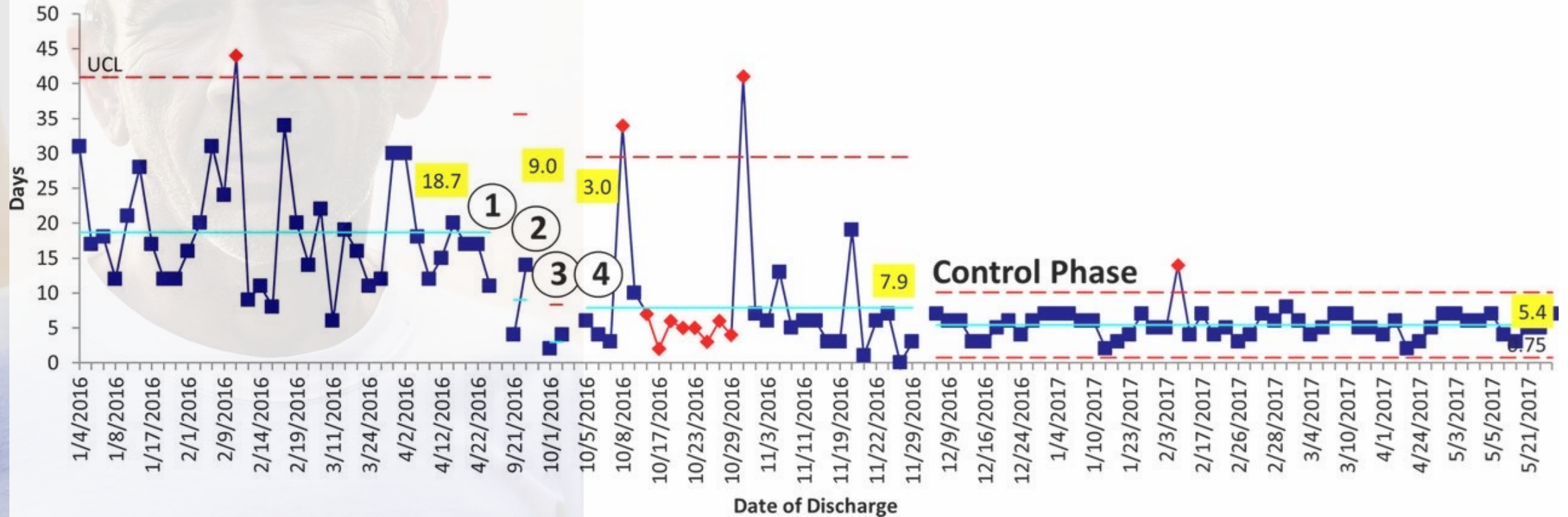




- 1) Add additional appointment slots.
- 2) Cross-train schedulers.
- 3) Cross-train insurance verification.
- 4) Schedule appointment prior to hospital discharge.

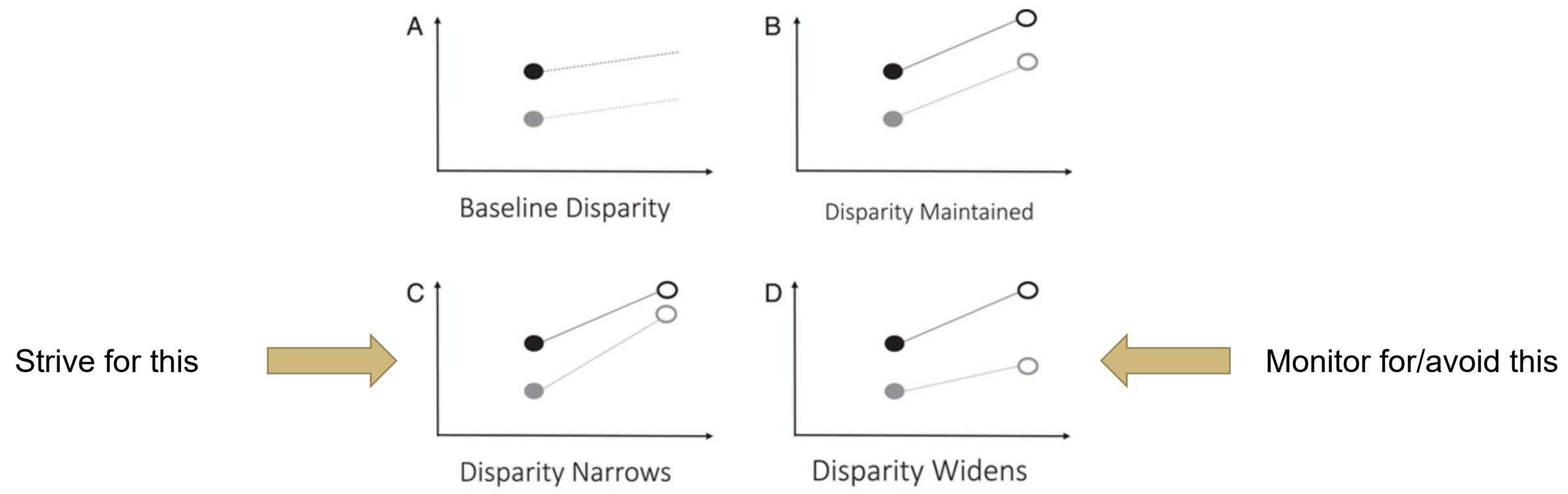


## Days from Hospital Discharge to First Scheduled Outpatient Cardiac Rehabilitation Appointment



# Consider the heterogeneity of your population.... Are some groups affected differently than others?

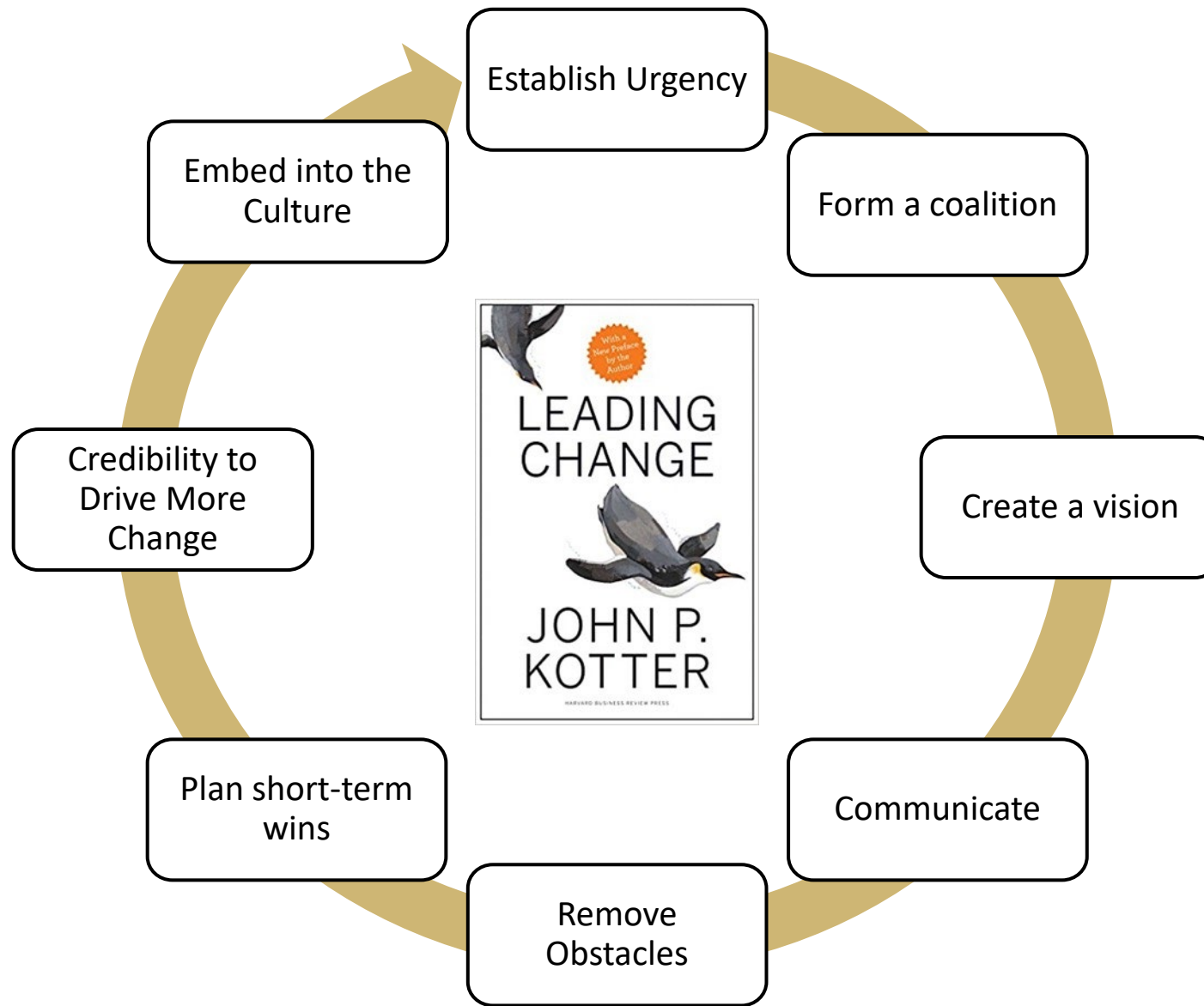
FIGURE 1



# Six Steps for a Successful QI Project

1. Define the problem.
2. Identify areas that can be improved.
3. Decide how you will measure progress.
4. Explicitly state your goals (SMART)
5. Implement and measure small tests of change.
6. Build upon success and sustain the process. ————— Embed into the culture









**BREAK-TIME**

Come back at ...!



# Change Management



Institute for Healthcare Quality,  
Safety and Efficiency

SCHOOL OF MEDICINE

UNIVERSITY OF COLORADO **ANSCHUTZ MEDICAL CAMPUS**



University of Colorado **Anschutz Medical Campus**

**IHQSE**

You've designed the PERFECT Intervention.

What next?

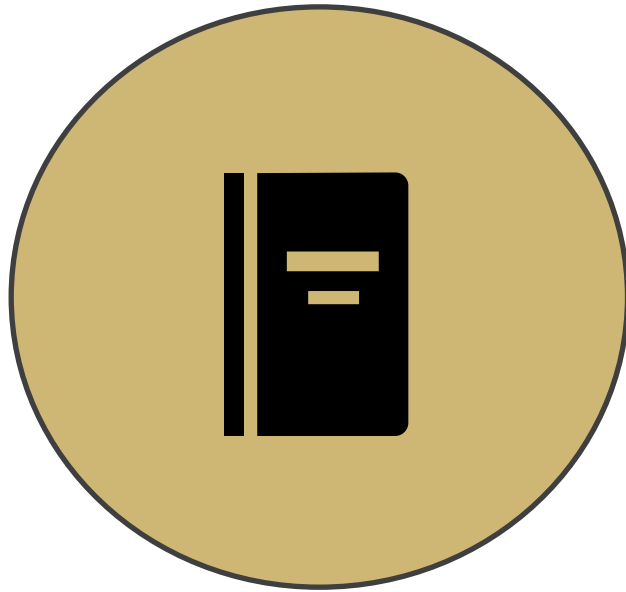


Make Others Jump (Change).

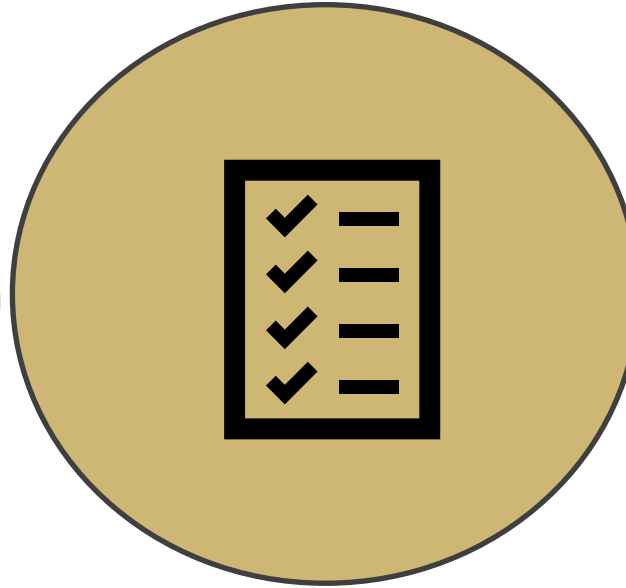
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# AGENDA

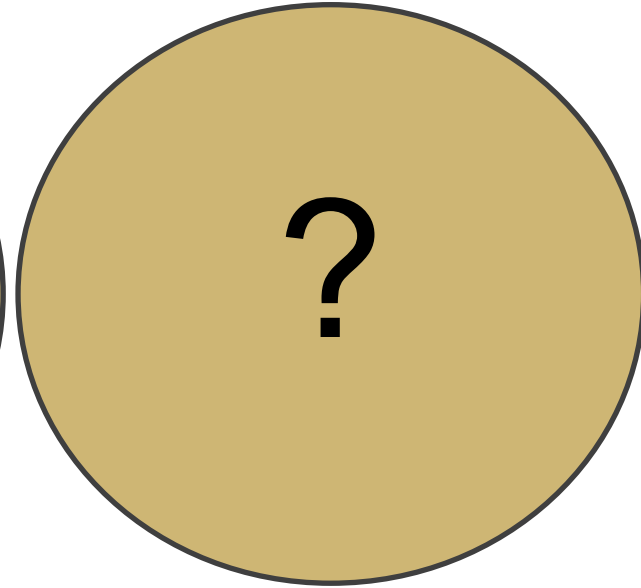
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**Change  
Case**



**Kotter's 8-Steps**



**Questions**



Romania: June, 2008



# Re-electing a Dead Mayor

Why would someone vote for a dead person?

“I know he died, but . . . I didn't want a change.”



UNIVERSITY OF COLORADO HOSPITAL

# A Local Story, 2008



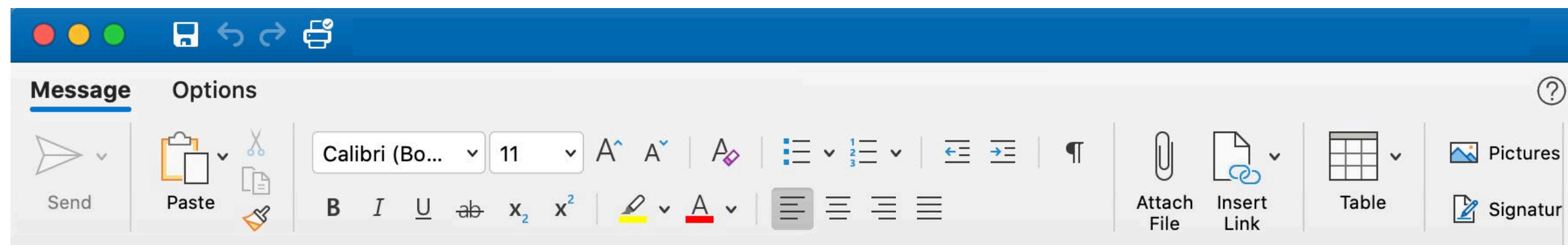
# Vancomycin Use in the ICU

Problem: Only **50%** of 1<sup>st</sup> vancomycin troughs within desired range of 10-20 mcg/mL

Solution: QI project to develop simple weight- and creatinine-based guide to dosing

- ICU and Pharmacy leadership buy-in
- Rolled out nomogram for the ICU
- Email sent to residents/faculty every month





I wanted to make everyone aware of the ongoing QI initiative in the MICU addressing initial vancomycin dosing. The standard 1 gram every 12 hours is not appropriate for many ICU patients and the first troughs have been in the therapeutic range of 10-20 mcg/mL only about 50% of the time. We have developed a very simple dosing nomogram (attached) that also includes guidelines on dosing for HD and CVVH, and when the troughs should be checked. Based on the existing data, we expect this nomogram to eliminate about 75% of subtherapeutic troughs and 50% of suprathreshold troughs.

The nomogram requires only the patient's actual body weight and MDRD-estimated GFR with age, gender, race, and serum creatinine (online at [www.mdrd.com](http://www.mdrd.com)).

We rely primarily on you as treating physicians to follow the nomogram and correctly order the antibiotics, decreasing the risk of under- or over-dosing your critically ill patients in the crucial initial 24-72 hours of therapy until the first trough is obtained. The MICU pharmacists will be helping you with the nomogram as well.

Thank you in advance for your help and your hard work. We welcome all questions and feedback on this quality improvement initiative.

# Vancomycin use in the ICU: **Outcomes**

Pre-intervention trough (10-20) 50%

Post-intervention trough (10-20) **50%**

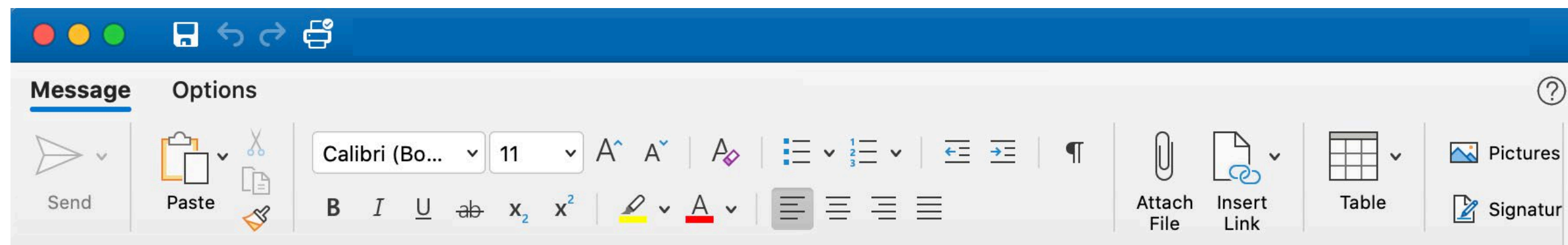
Protocol adherence rate **20%!**





Why didn't the providers change their behavior?

What was wrong with this approach to leading change?



I wanted to make everyone aware of the ongoing QI initiative in the MICU addressing initial vancomycin dosing. The standard 1 gram every 12 hours is not appropriate for many ICU patients and the first troughs have been in the therapeutic range of 10-20 mcg/mL only about 50% of the time. We have developed a very simple dosing nomogram (attached) that also includes guidelines on dosing for HD and CVVH, and when the troughs should be checked. Based on the existing data, we expect this nomogram to eliminate about 75% of subtherapeutic troughs and 50% of suprathreshold troughs.

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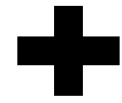
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Thank you in advance for your help and your hard work. We welcome all questions and feedback on this quality improvement initiative.

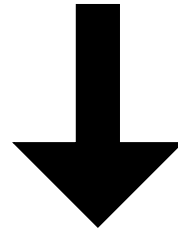
People (generally)  
dislike change.



Change is hard.

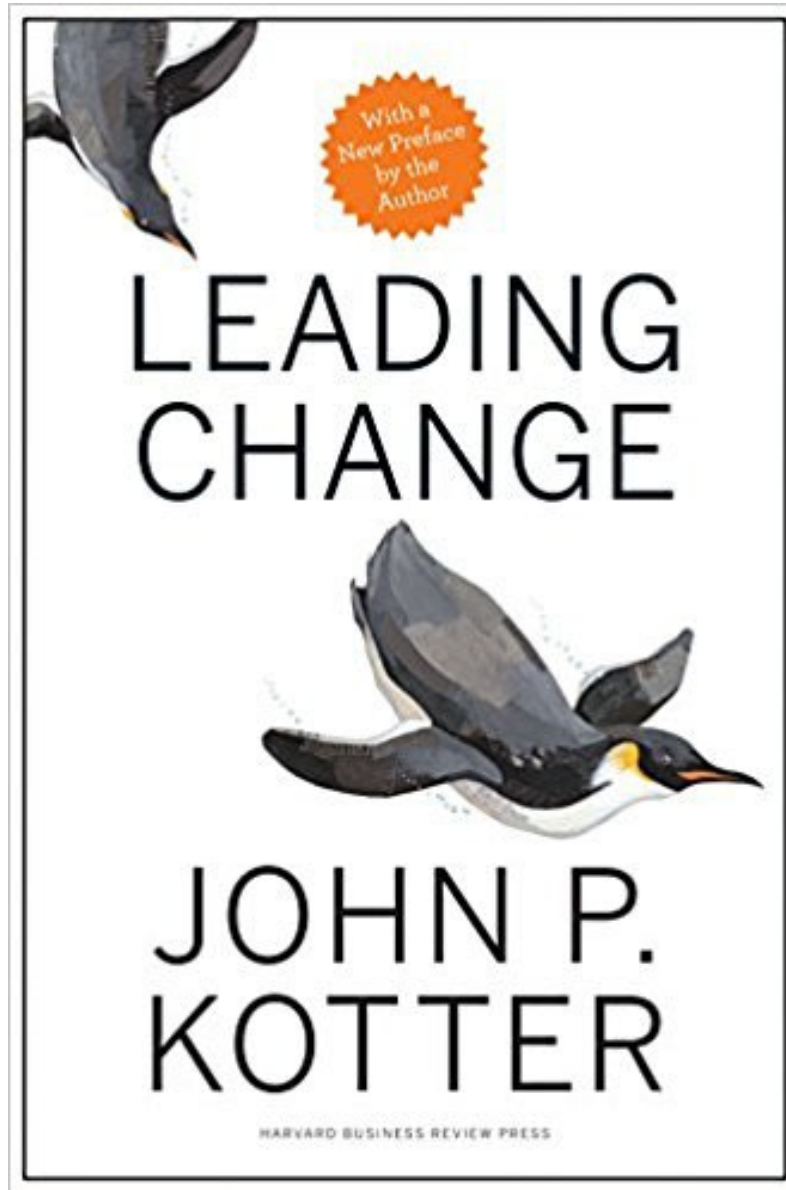


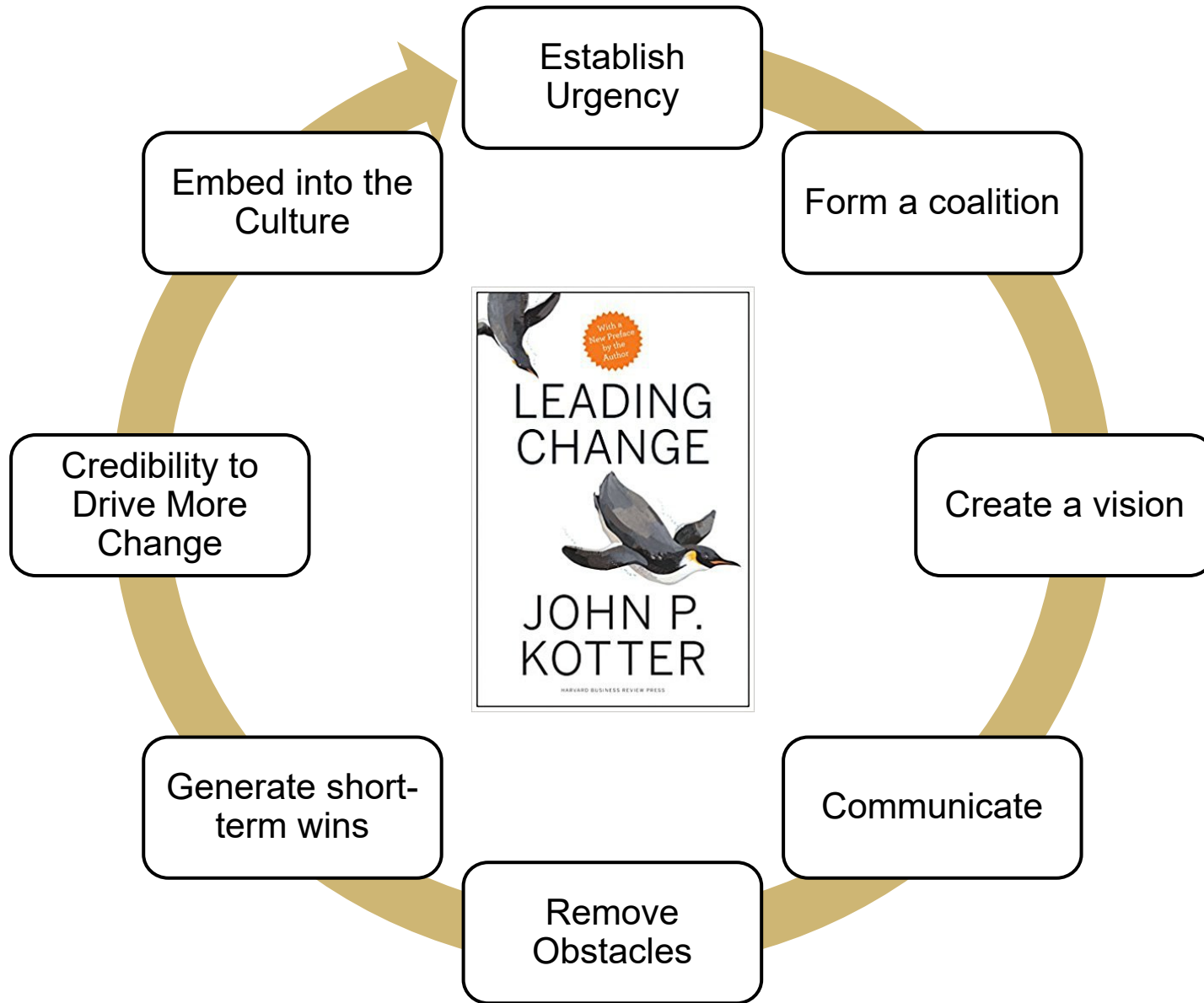
Good  
enough is a  
barrier to  
greatness



NO CHANGE









# Establish Urgency



Establish  
Urgency



# Establish Urgency – What motivates you?



# Establish Urgency



1.0 - Survival

2.0 - Extrinsic Motivation: reward, punishment

3.0 - Intrinsic Motivation

*Burning Aspiration*



NEW YORK TIMES BESTSELLER

"Provocative and fascinating." —MALCOLM GLADWELL

Daniel H. Pink

author of *A Whole New Mind*

DRIVE

The Surprising Truth  
About What Motivates Us

Establish  
Urgency

AUTONOMY

MASTERY

PURPOSE

PLAY

CONNECTION





University of Colorado **Anschutz Medical Campus**

| **IHQSE**



**Breakout**



**10 minutes**

- What is your burning platform? (IE: SO WHAT?)



# Form a Guiding Coalition







Footloose, 1984

# Who - Anyone impacted by your work

## To Gain Trust, Expertise, Insight:

- Interprofessional
- Patients
- The Cool Kids



## To Gain Resources:

- Various levels of organization
- The Bosses



**Key Partner  
Engagement**



Guiding Coalition

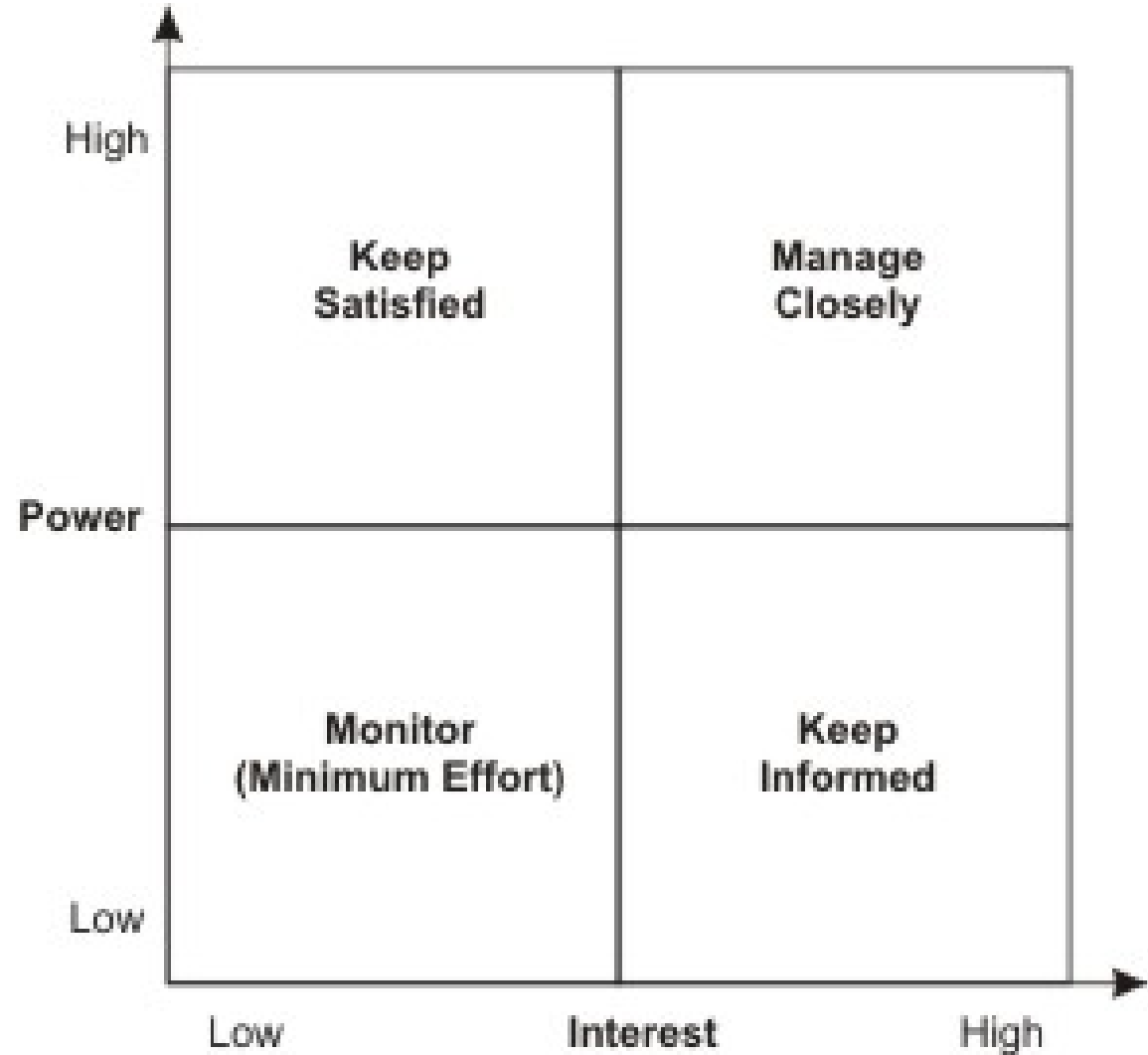


# Stakeholder/Partner Map

Step 1: Identify

Step 2: Prioritize

Step 3: Understand



Write down one person who you will contact after this session to move your work forward.



# Create a Vision



Create  
a Vision



**Earth's most customer  
centric company.**

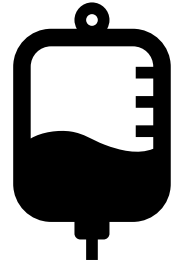


**A world without  
Alzheimer's disease.**



**Eliminate all  
preventable harm.**

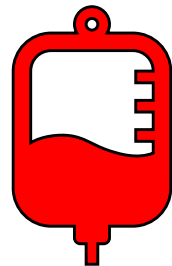
Create  
a Vision



**Discharge instructions will accurately list medications for patients discharged on IV antibiotics**



**Patients will be admitted during day shift for planned chemotherapy.**



**We will transfuse wisely.  
Not a drop wasted.**



# Communicate





CHANGE  
WE CAN BELIEVE IN

Communicate



How much?

$$7 \times 7$$

*Hundreds..*



# Wean – er of the Month Party



# The Elevator Pitch

Communicate

Introduction: Who are you?

Hook: What is the problem or opportunity?

Solution: What are you doing about it?

Value proposition: How does this create value for him/her?

Call to action: What next?



# Remove Obstacles



Remove  
Obstacles



## VANCOMycin IV + Pharmacy Consult

✓ Accept

- ✓  **VANCOMycin (VANCOGIN) in NS 500 mL IVPB**  
Intravenous, Administer over 2.5 Hours, EVERY 12 HOURS, First dose today at 1146  
Pharmacy Dosing Service to manage VANCOMycin therapy.

**Allergy/Contraindication:** Vancomycin

- ✓ **Inpatient Consult to Pharmacy**  
ASAP, ONCE, today at 1146, For 1 occurrence



# Generate Short-Term Wins





Short  
Term  
Wins



# Celebrating Wins



Use Credibility to  
Drive More Change



# MEET THE TEAM



## EMILY GOTTENBORG, MD

IHQSE Faculty  
University of Colorado,  
Division of Hospital Medicine

*The Joint Commission Journal on Quality and Patient Safety*

**Operations Management**

“Not So Fast!” The Complexity of Attempting to Decrease Door-to-Floor Time for Emergency Department Admissions



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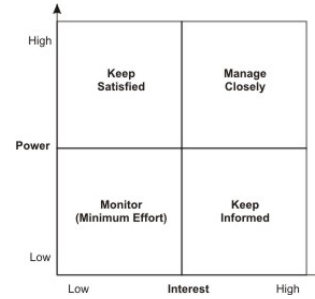
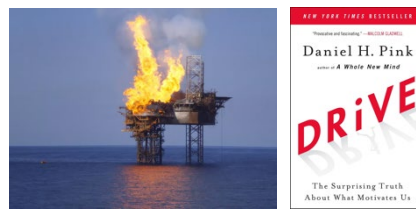
**IHQSE**

Embed it in the Culture



Culture  
Change





Establish Urgency

Form a coalition

Create a vision



Communicate

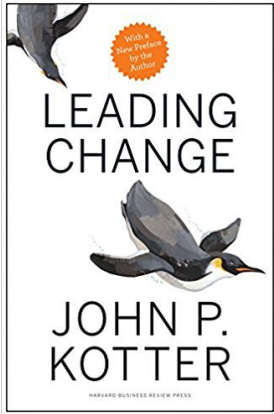
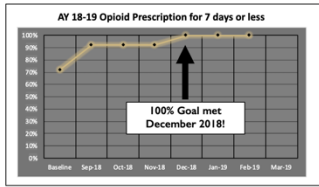


Remove Obstacles



Embed into the Culture

Credibility to Drive More Change



Generate short-term wins



“Survival is optional. No one has to change.”



W. Edwards Deming





