A Deeper Dive into the Science of Improvement

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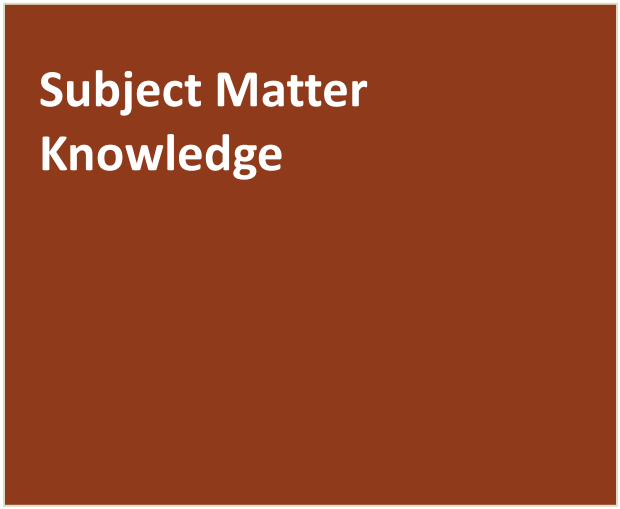
Objectives

To build knowledge of and skills with:

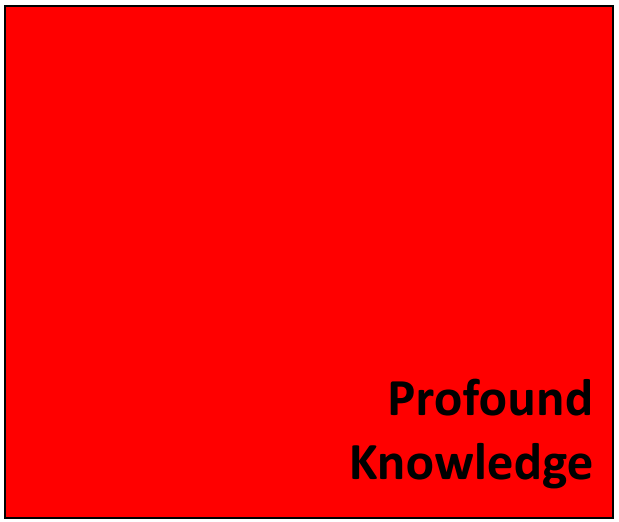
- The Model for Improvement
- Writing Aim Statements
- Developing measures
- Deciding which ideas will lead to improvement
- Appling the Sequence for Improvement

Two Types of Knowledge



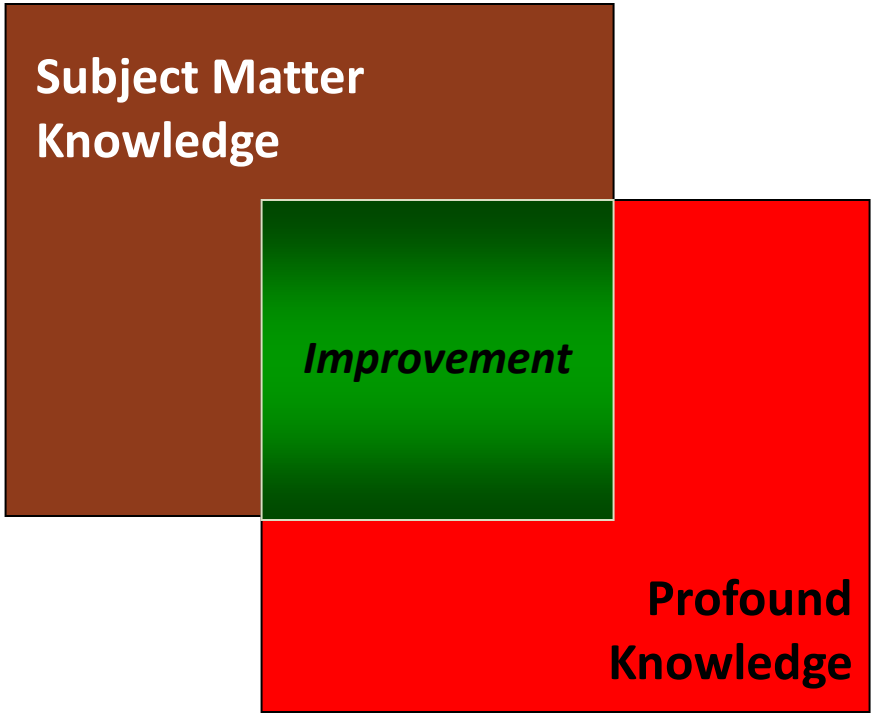
Subject Matter Knowledge: Knowledge basic to the things we do in life. Professional knowledge.

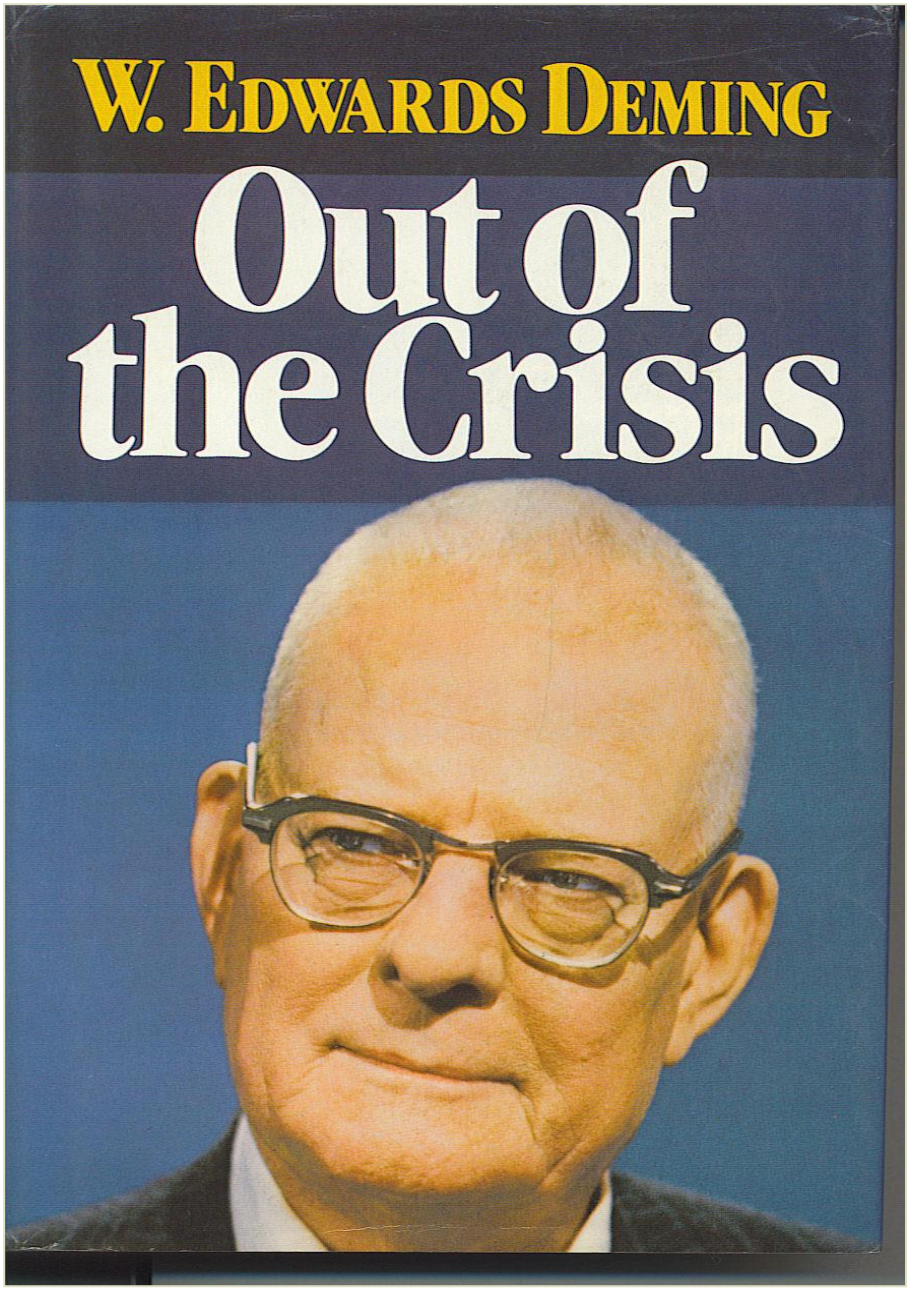
Profound Knowledge: The interplay of the theories of systems, variation, knowledge, and psychology.



Knowledge for Improvement

Improvement: Learn to combine subject matter knowledge and profound knowledge in creative ways to develop effective changes for improvement.

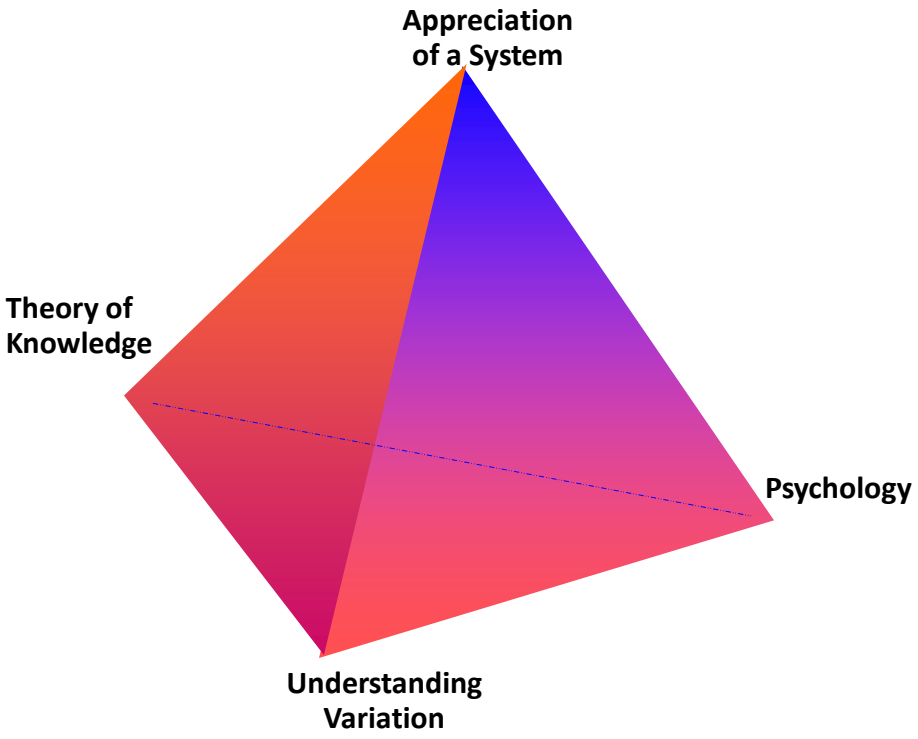




The Improvement Guide, page xxiv.

"Dr. Edwards Deming made an important contribution to the science of improvement by recognizing the elements of knowledge that underpin improvements over a wide spectrum of applications. He gave this body of knowledge the foreboding name "a System of Profound Knowledge." "Profound" denotes the deep insight that this knowledge provided into how to make changes that will result in improvement in a variety of settings. "System" denotes the emphasis on the *interaction* of the components rather than on the components themselves."

W. E. Deming, *The New Economics for Industry, Government, Education*. MIT, 1993



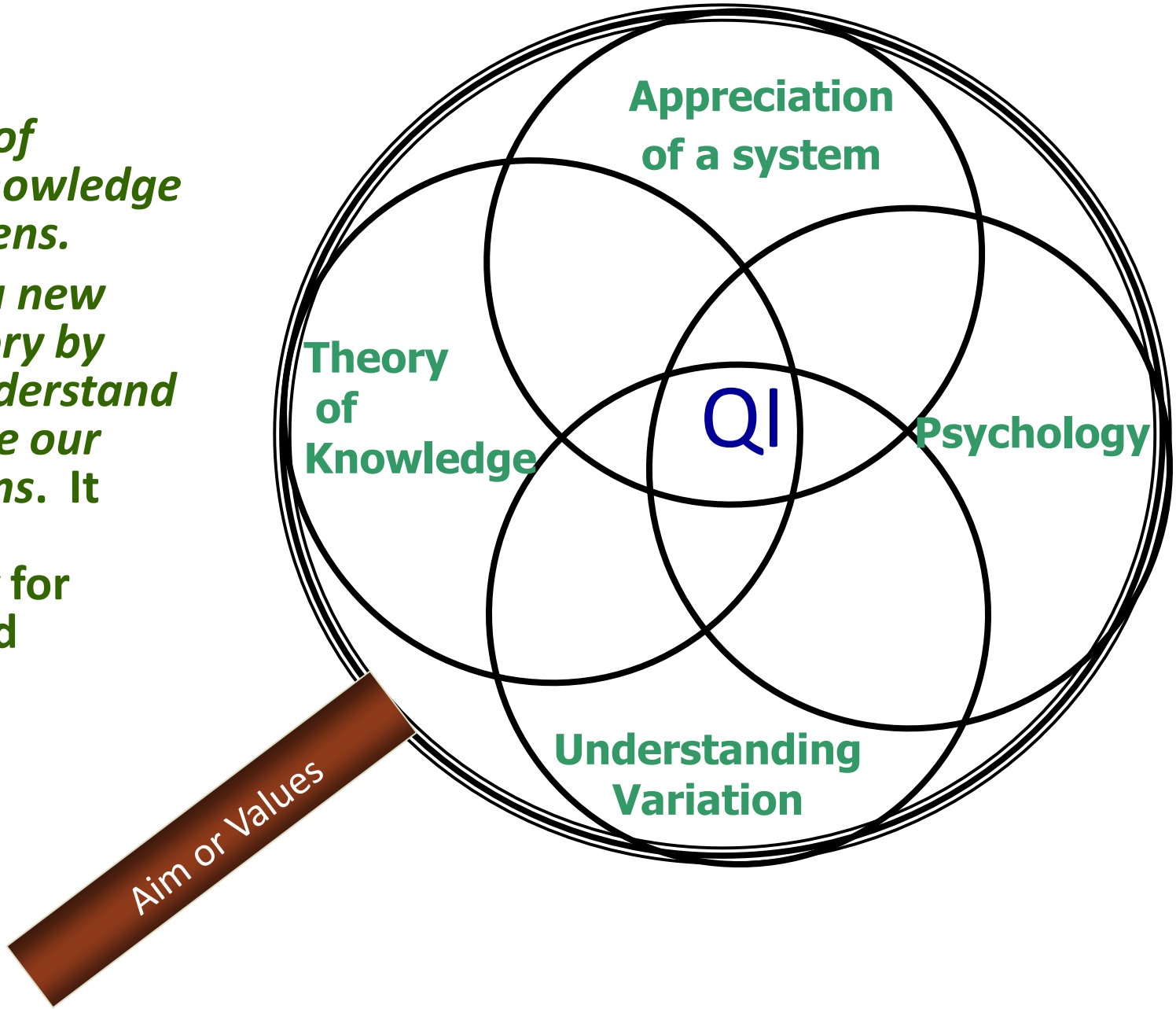
"One need not be eminent in any part of profound knowledge in order to understand it and to apply it. The various segments of the system of profound knowledge cannot be separated. They interact with each other**. For example knowledge about psychology is incomplete without knowledge of variation."**

Profound - having intellectual depth and insight (Webster)

The Lens of Profound Knowledge

The system of profound knowledge provides a lens.

It provides a new map of theory by which to understand and optimize our organizations. **It provides an opportunity for dialogue and learning!**



What *insights* might be obtained by looking through the Lens of Profound Knowledge?

Appreciation for a System

- Interdependence dynamism
- World is not deterministic
- Optimization, interactions
- System must have an aim
- Whole is greater than sum of the parts

Theory of Knowledge

- Prediction
- Learning from theory, experience
- Operational definitions
- PDSA for learning and improvement

Psychology

- Interaction between people
- Intrinsic motivation, movement
- Beliefs, assumptions
- Will to change

Understanding Variation

- Variation is to be expected
- Common or special causes
- Ranking, tampering
- Potential mistakes

Exercise: Profound Knowledge

- Now that you understand the components of PK, we would like to give you an opportunity to apply the Lens of Profound Knowledge to your project.
- **You can work alone or with others.**
- Use the PK Worksheet to record your responses.
- **Engage in a dialogue on PK (not a debate, a discussion or a chit chat but a true dialogue about the theories and assumptions surrounding your project and its Aim.)**
- Spend about 10 minutes on this exercise.

Profound Knowledge Worksheet

Appreciation for a System

-
-
-
-

Psychology

-

See Worksheet Packet

Theory of Knowledge

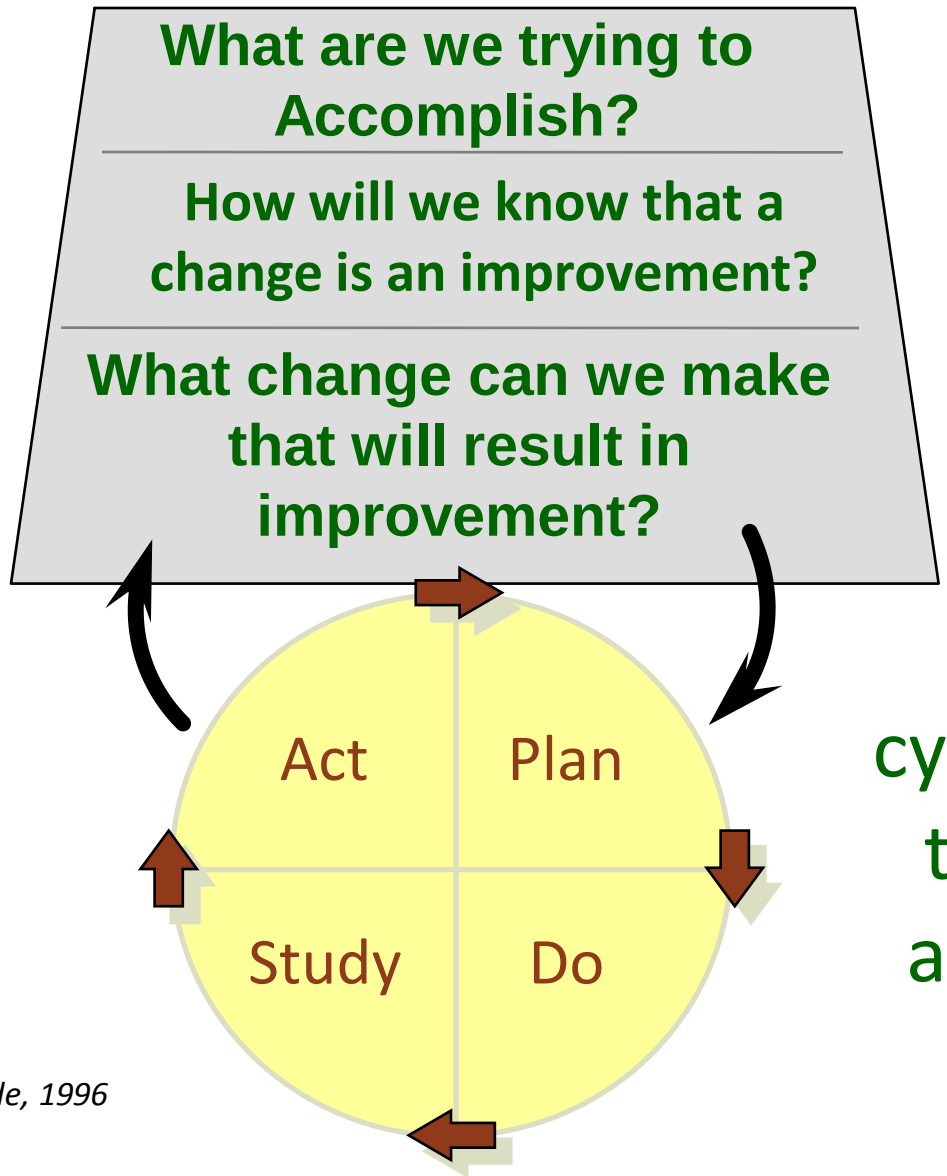
-
-
-
-

Understanding Variation

-
-
-
-

The Model for Improvement

The three questions provide the strategy



The PDSA cycle provides the tactical approach to work

Source:

Langley, et al. *The Improvement Guide, 1996*

Aim Statement

- *Define the **System** where the improvement will occur*
- *Specify a **Numerical Goal** (How good?)*
- *Identify the **Timeframe** (By when?)*
- *Provide any **Guidance** that identifies constraints in the system or any issues that might affect the performance of the team's work*

Constructing an Aim Statement

- **Boundaries**: the *system* to be improved (scope, patient population, processes to address, providers, beginning & end, etc.)
- Specific **numerical *goals*** for ***outcomes***
  - Ambitious but achievable
- Includes ***timeframe*** *(How good by when?)*
- Provides ***guidance*** on sponsor, resources, strategies, barriers, interim & process goals

Constructing an Aim Statement

- **Involve senior leaders**
  - Obtain sponsorship (geared to the project's complexity)
  - Provide frequent and brief updates (practice the 2 minute elevator speech)

- **Focus on issues that are important to your organization**
  - Connect the team Aim Statement to the Strategic Plan
  - Build on the work of others (steal shamelessly!)

Check Points in Developing an Aim Statement

AIM Content

- Explicit over arching description
- Specific actions or focus
- Goals

AIM Characteristics

- Measurable (How good?)
- Time specific (By when?)
- Define participants and customers

Getting Started

1. An Executive Leader and a Day-to-Day Leader are selected to lead the improvement work.
2. Executive Leader convenes a Cross Continuum Improvement Team to lead the reducing readmissions initiative.
3. Cross Continuum Team Identifies opportunities for improvement using:
    a. In-depth review of the last five rehospitalizations
    b. 30-day all-cause readmission rates
    c. Patient experience data on communications and discharge preparations
4. Select one or two pilot units or a pilot population and develop an aim statement.

Cross Continuum Teams

- One of the most transformational changes in the STAAR Collaborative
- Reinforces that readmissions are not solely a hospital problem
- Need for involvement at two levels:
  1) at the executive level to remove barriers and develop overall strategies for ensuring care coordination
  2) at the front-lines -- power of “senders” and “receivers” co-redesigning processes to improve transitions of care
- New competencies in partnering across care settings will be a great foundation integrated care delivery models (e.g. bundled payment models, ACOs)

Diagnostic Reviews

- Recommend that teams complete a formal review of the last five readmissions every 6 months (chart review and interviews)
- Members from the cross continuum team hear first-hand about the transitional care problems “through the patients’ eyes”
- Engages the “hearts and minds” of clinicians and catalyzes action toward problem-solving
- Opportunities for learning from reviewing a small sampling of patient experiences are innumerable

Worksheet B: Interviews with Patients, Family Members, and Care Team Members
If possible, conduct the interviews on the same patients from the chart review. Use a separate worksheet for each interview.

Ask Patients and Families:

How do you think you became sick enough to come back to the hospital?

Did you see your doctor or the doctor's nurse in the office before you came back to the hospital?

Yes ☐ If yes, which doctor (PCP or specialist) did you see?

No ☐ If no, why not?

Describe any difficulties you had to get an appointment or getting to that office visit.

Has anything gotten in the way of your taking your medicines?

How do you take your medicines and set up your pills each day?

Describe your typical meals since you got home.

Ask Care Team Members:

What do you think caused this patient to be readmitted?

STate Action on Avoidable Rehospitalizations

An initiative of The Commonwealth Fund & the Institute for Healthcare Improvement

http://www.ihi.org/IHI/Programs/StrategicInitiatives/STateActiononAvoidableRehospitalizationsSTAAR.htm?TabId=4

Sample Aim #1

Shady Oaks Hospital will improve transitions home for all heart failure patients as measured by a reduction in unplanned 30-day all-cause readmission rates for heart failure patients (decreasing the rate from 25% to 15% or less in 18 months.)

We will focus on patient and family caregiver's understanding of medications and comprehension of signs and symptoms that require medical attention, timely follow-up in he heart failure clinic and coordination with community providers.

Sample Aim #2

St. Elsewhere Hospital will improve transitions home for all patients as measured by a decrease in the 30-day all-cause hospital readmission rate from 12% to 8% percent or less within 24 months.

We will start with patients on 4W and 5S and focus on doing comprehensive assessments of all patients' home-going needs, real-time handovers to community providers, customized post-acute follow-up, and improving patients' understanding of self-care. We will expect to see a decrease in the readmission rates for patients discharged from those units of at least 10% within 12 months.

Exercise: Aim Statement

- If you are already on an improvement team and have an Aim Statement, then review your Aim for clarity, performance expectations, and completion date.
- If you aren't on an improvement team, create an Aim Statement for a team you would like to get started.
- Spend about 10 minutes working on this exercise, then compare your statement with your neighbors.
- Use the ***Aim Statement Worksheet*** to create or revisit your an Aim Statement.

Aim Statement Worksheet

Team name: _____

Aim statement

(What's the problem? Why is it important? What are we going to do about it?)

See Worksheet Packet

How good? _____

By when? _____

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The Model for Improvement

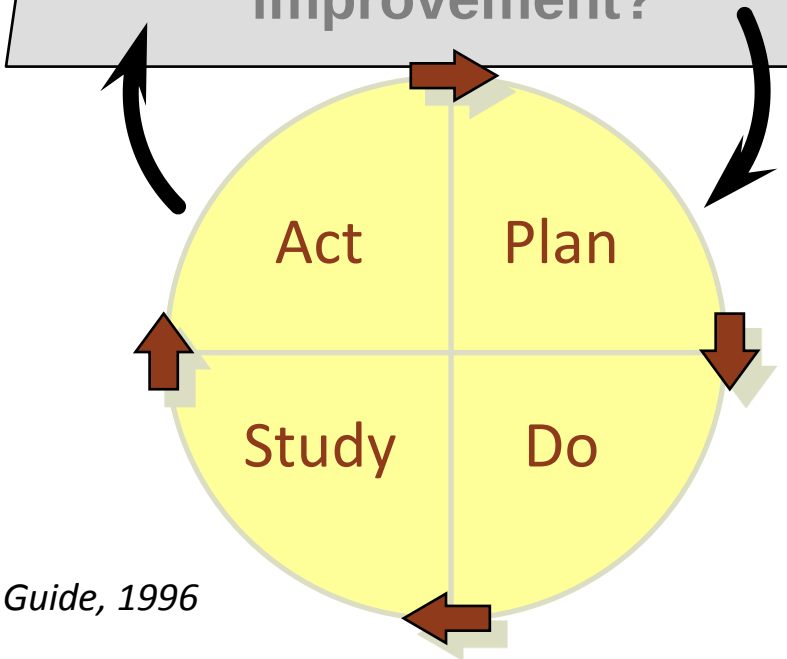
The three questions provide the strategy

What are we trying to Accomplish?

How will we know that a change is an improvement?

Question #2

What change can we make that will result in improvement?



The PDSA cycle provides the tactical approach to work

Source:

Langley, et al. *The Improvement Guide, 1996*

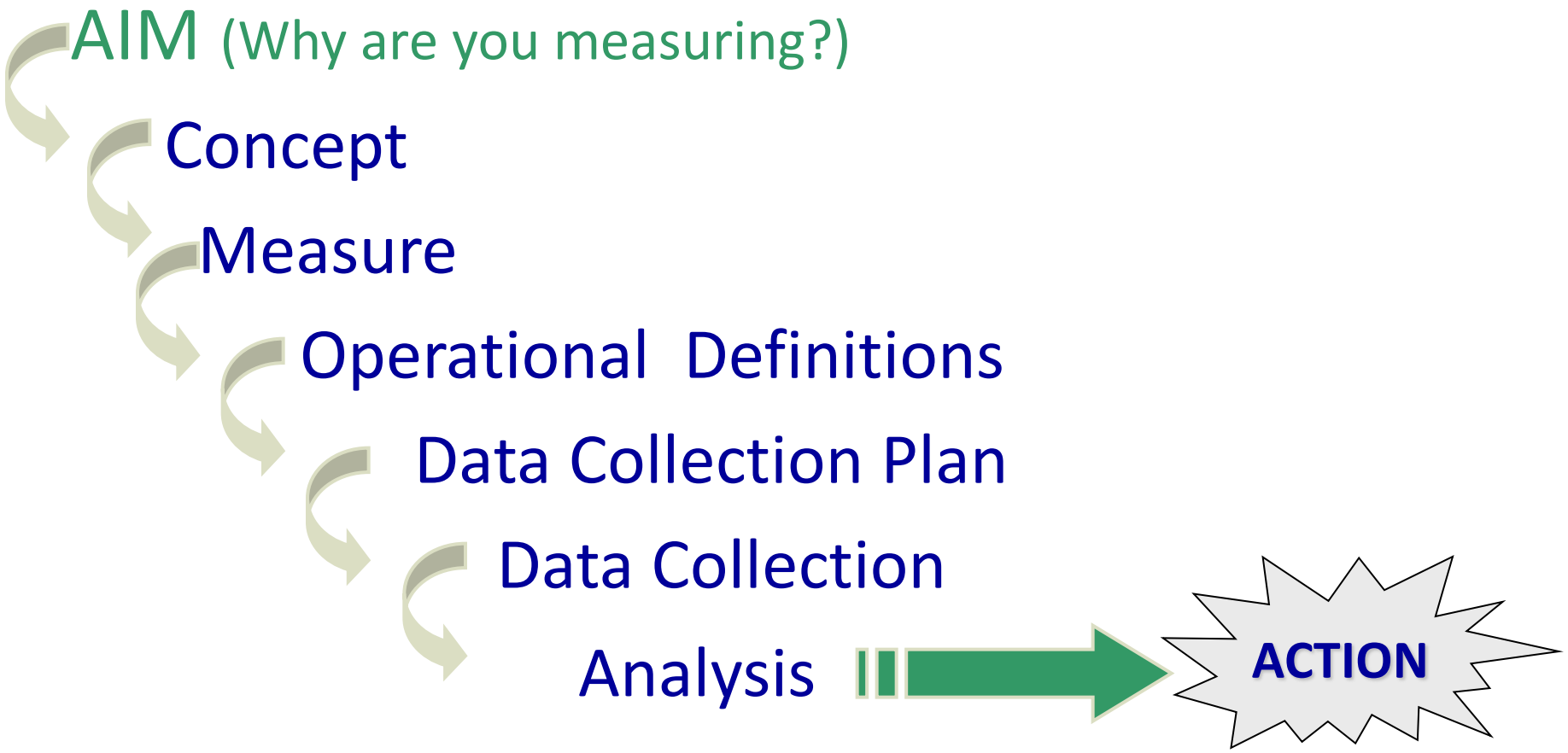
Measurement is Central to the Team's Ability to Improve

- The purpose of measurement in QI work is for *learning not judgment!*
- **All measures have limitations, but the limitations do not negate their value for learning.**
- You need a balanced set of measures reported daily, weekly or monthly to determine if the process has improved, stayed the same or become worse.
- **These measures should be linked to the team's Aim.**
- Measures should be used to guide improvement and test changes.
- **Measures should be integrated into the team's daily routine.**
- Data should be plotted over time on annotate graphs.
- **Focus on the Vital Few!**

Do you have a plan to guide your quality measurement journey?

The Quality Measurement Journey

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators.* Jones and Bartlett Publishers, 2004.



The Quality Measurement Journey

AIM – reduce inpatient falls by 30% in 6 months

Concept – inpatient falls

Outcome Measure – IP falls rate (falls per 1000 patient days)

Operational Definitions – (# falls/inpatient days) x 1000

Data Collection Plan – monthly; no sampling; all IP units

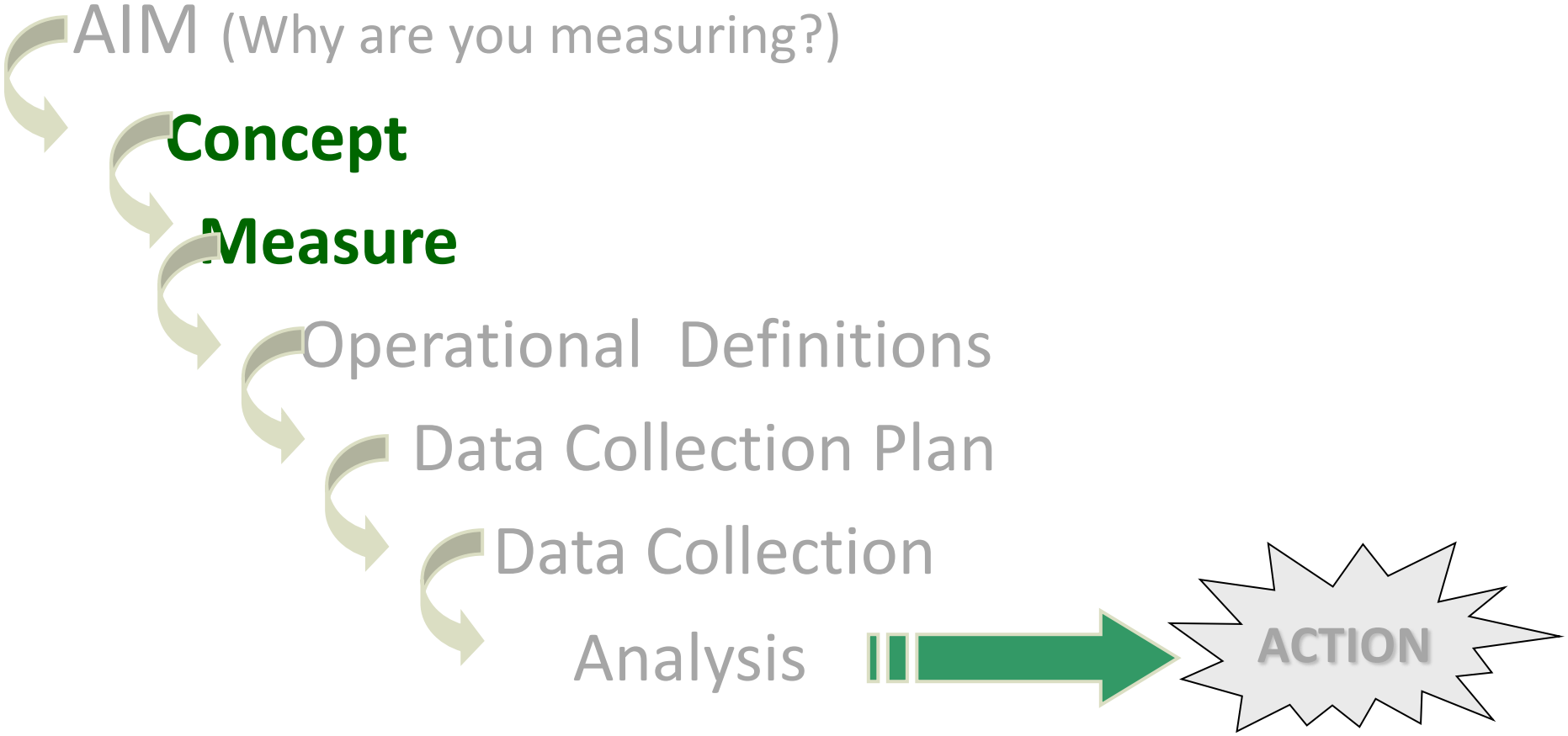
Data Collection – units send data to QI Dept. for analysis

Analysis – control chart

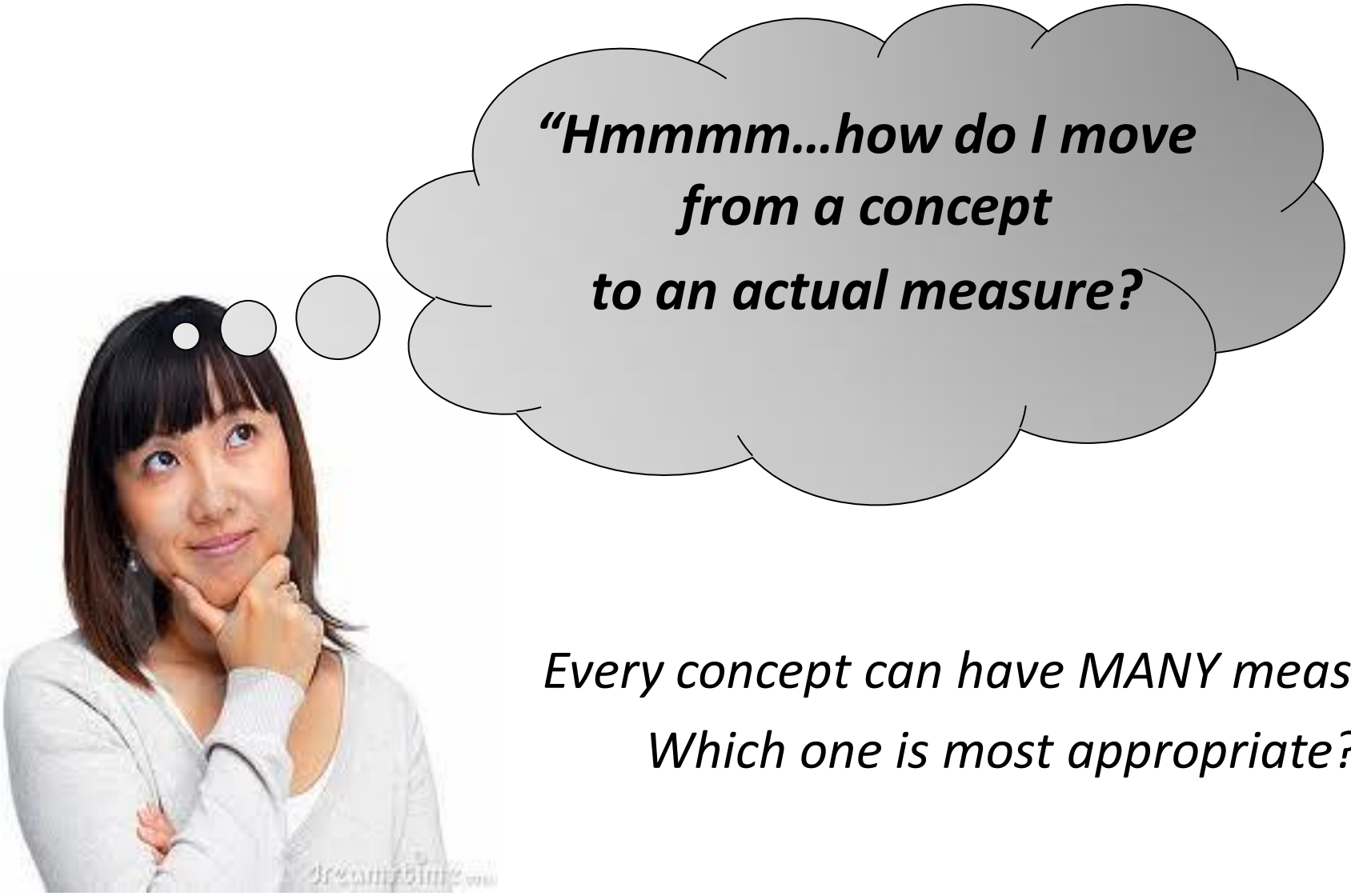
Tests of Change

The Quality Measurement Journey

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators.* Jones and Bartlett Publishers, 2004



Moving from a Concept to Measure



Every concept can have MANY measures.

Which one is most appropriate?

Every concept can have many measures

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators. Jones and Bartlett, 2004.*

Concept	Potential Measures
Hand Hygiene	Ounces of hand gel used each day
	Ounces of gel used per staff
	Percent of staff washing their hands (before & after visiting a patient)
Medication Errors	Percent of errors
	Number of errors
	Medication error rate
VAPs	Percent of patients with a VAP
	Number of VAPs in a month
	The number of days without a VAP

A Family of Measures

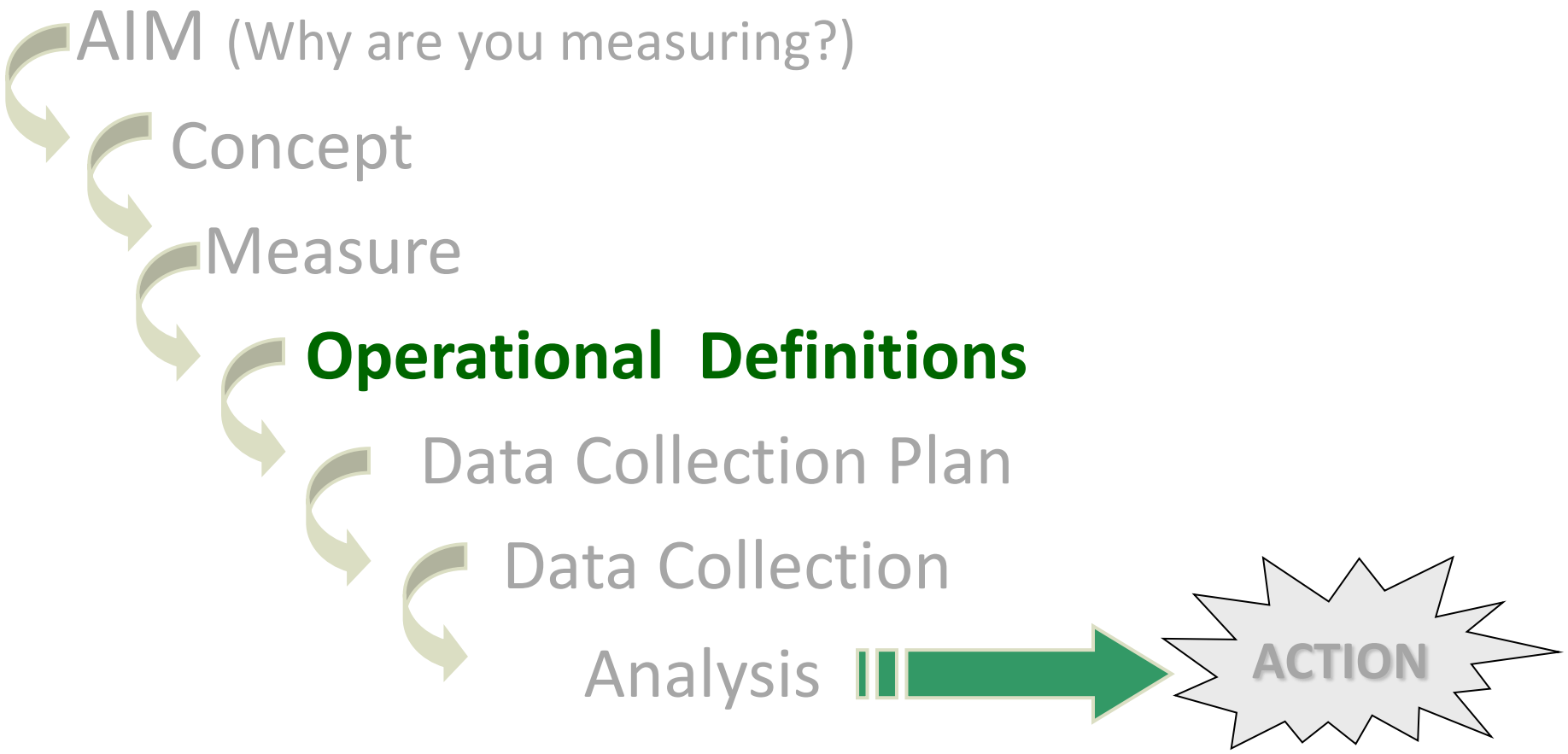
- **Outcome Measures:** Voice of the customer or patient. How is the system performing? What is the result?
- **Process Measures:** Voice of the workings of the system. Are the parts/steps in the system performing as planned?
- **Balancing Measures:** Looking at a system from different directions/dimensions. What happened to the system as we improved the outcome and process measures (e.g. unanticipated consequences, other factors influencing outcome)?

Potential Family of Measures for Improvement in the ED

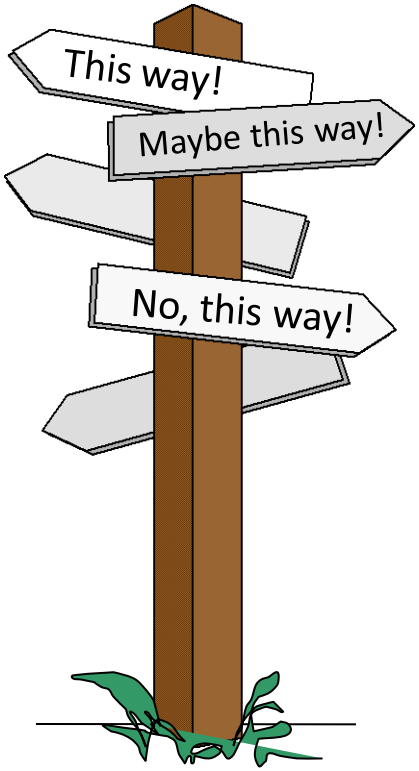
Topic	Outcome Measures	Process Measures	Balancing Measures
Improve waiting time and patient satisfaction in the ED	Total Length of Stay in the ED Patient Satisfaction Scores	Time to registration Patient / staff comments on flow % patient receiving discharge materials Availability of antibiotics	Volumes % Leaving without being seen Staff satisfaction Financials

The Quality Measurement Journey

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators.* Jones and Bartlett Publishers, 2004.



Operational Definitions



***"Would you tell me, please, which way I ought to go from here,"* asked Alice?**

***"That depends a good deal on where you want to get to,"* said the Cat.**

***"I don't much care where"* - said Alice.**

***"Then it doesn't matter which way you go,"* said the Cat.**

From *Alice in Wonderland*, Brimax Books, London, 1990.

An Operational Definition...

… is a description, in quantifiable terms, of what to measure and the steps to follow to measure it consistently.

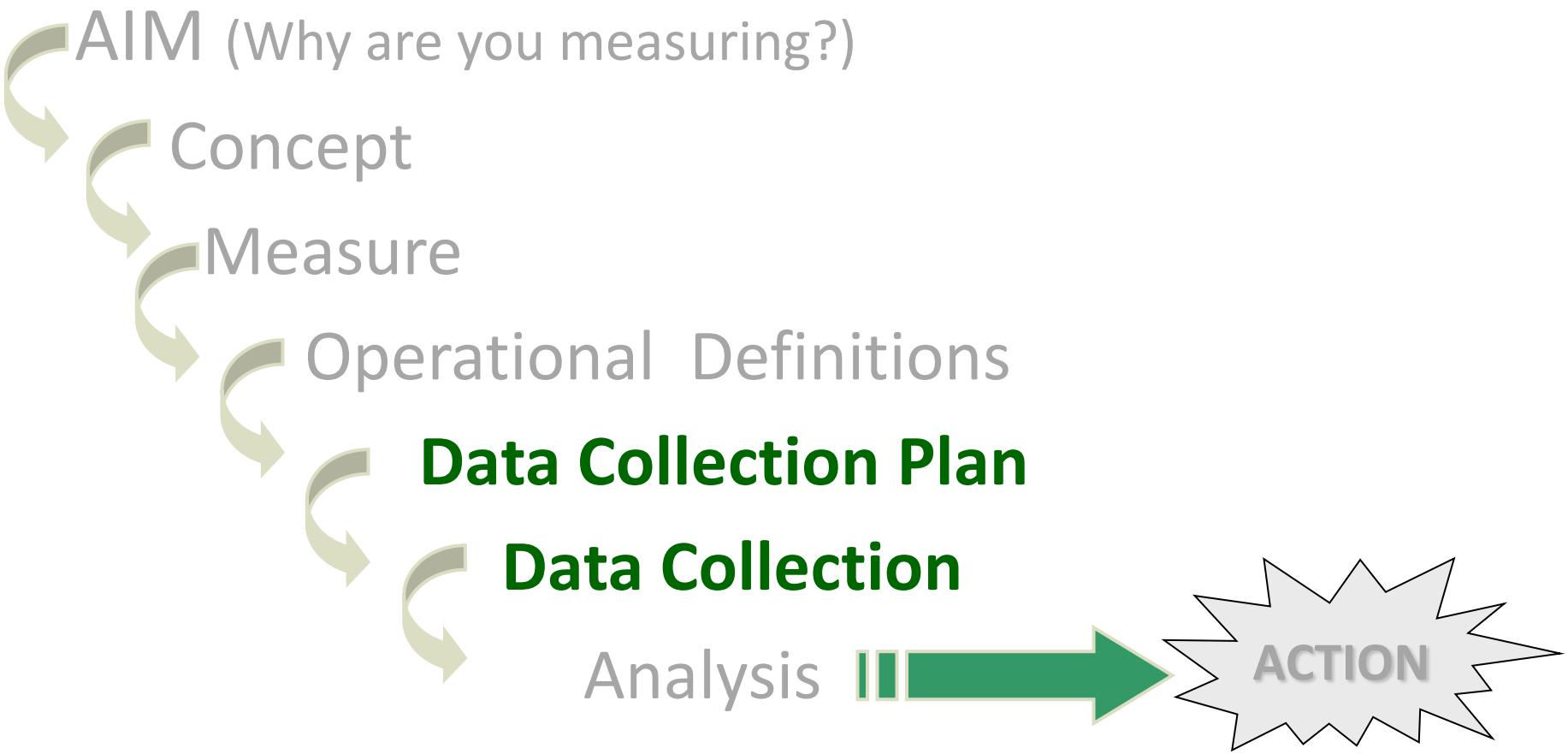
- **Gives gives communicable meaning to a concept**
- **Is clear and unambiguous**
- **Specifies measurement methods and equipment**
- **Identifies criteria**

How do you define the following healthcare concepts?

- World Class Performance
- Alcohol related admissions
- Teenage pregnancy
- Cancer waiting times
- Health inequalities
- Asthma admissions
- Childhood obesity
- Patient education
- Health and wellbeing
- Adding life to years and years to life
- Children's palliative care
- Safe services
- Smoking cessation
- Urgent care
- Delayed discharges
- End of life care
- Falls (with/without injuries)
- Childhood immunizations
- Complete maternity service
- Patient engagement
- Moving services closer to home
- Successful breastfeeding
- Ambulatory care
- Access to health in deprived areas
- Diagnostics in the community
- Productive community services
- Vascular inequalities
- Breakthrough priorities

The Quality Measurement Journey

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators.* Jones and Bartlett Publishers, 2004.



Key Data Collection Strategies

Stratification

- **Separation & classification of data according to predetermined categories**
- Designed to discover patterns in the data
- **For example, are there differences by shift, time of day, day of week, severity of patients, age, gender or type of procedure?**
- Consider stratification BEFORE you collect the data

Sampling Methods

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators.* Jones and Bartlett Publishers, 2004.

Probability Sampling Methods

- Simple random sampling
- Stratified random sampling
- Stratified proportional random sampling
- Systematic sampling
- Cluster sampling

Non-probability Sampling Methods

- Convenience sampling
- Quota sampling
- Judgment sampling

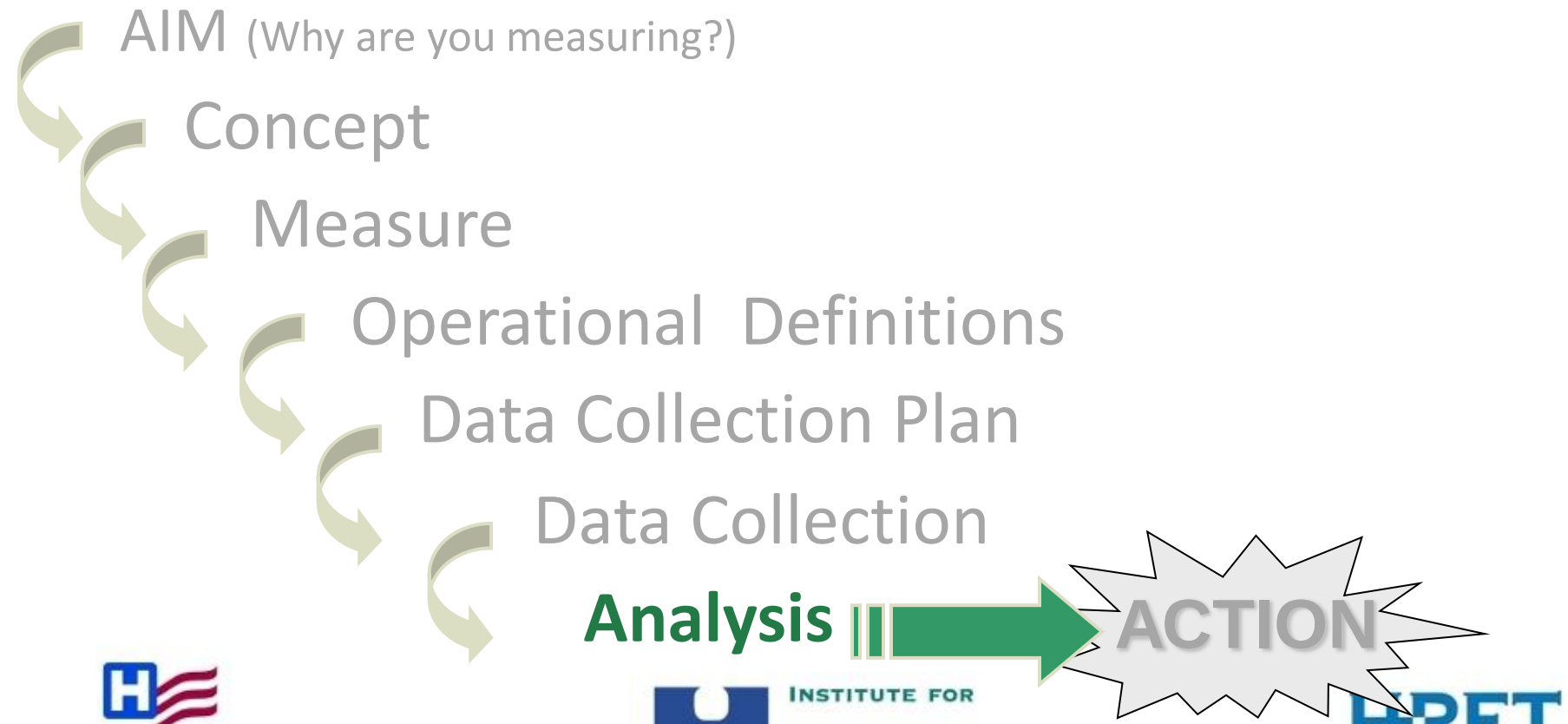
Data Collection: How Often?

Match the frequency of measurement to the rhythm of events and the ability of the process to respond to your improvement activities.

Measurement Concept	Data Frequency
Monitor blood pressure to determine if the prescribed medication and dosage are having the desired impact	Daily
Monitor time to next available appointment in a six month health clinic project to improve care access	Weekly
Monitor hand hygiene compliance in a major hospital system in a two-year drive to reduce infections	Monthly
Monitor if the cholesterol lowering medication and dosage are having the desired impact	≥Monthly
Monitoring the patient experience	Daily, weekly, monthly?

The Quality Measurement Journey

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators.* Jones and Bartlett Publishers, 2004.



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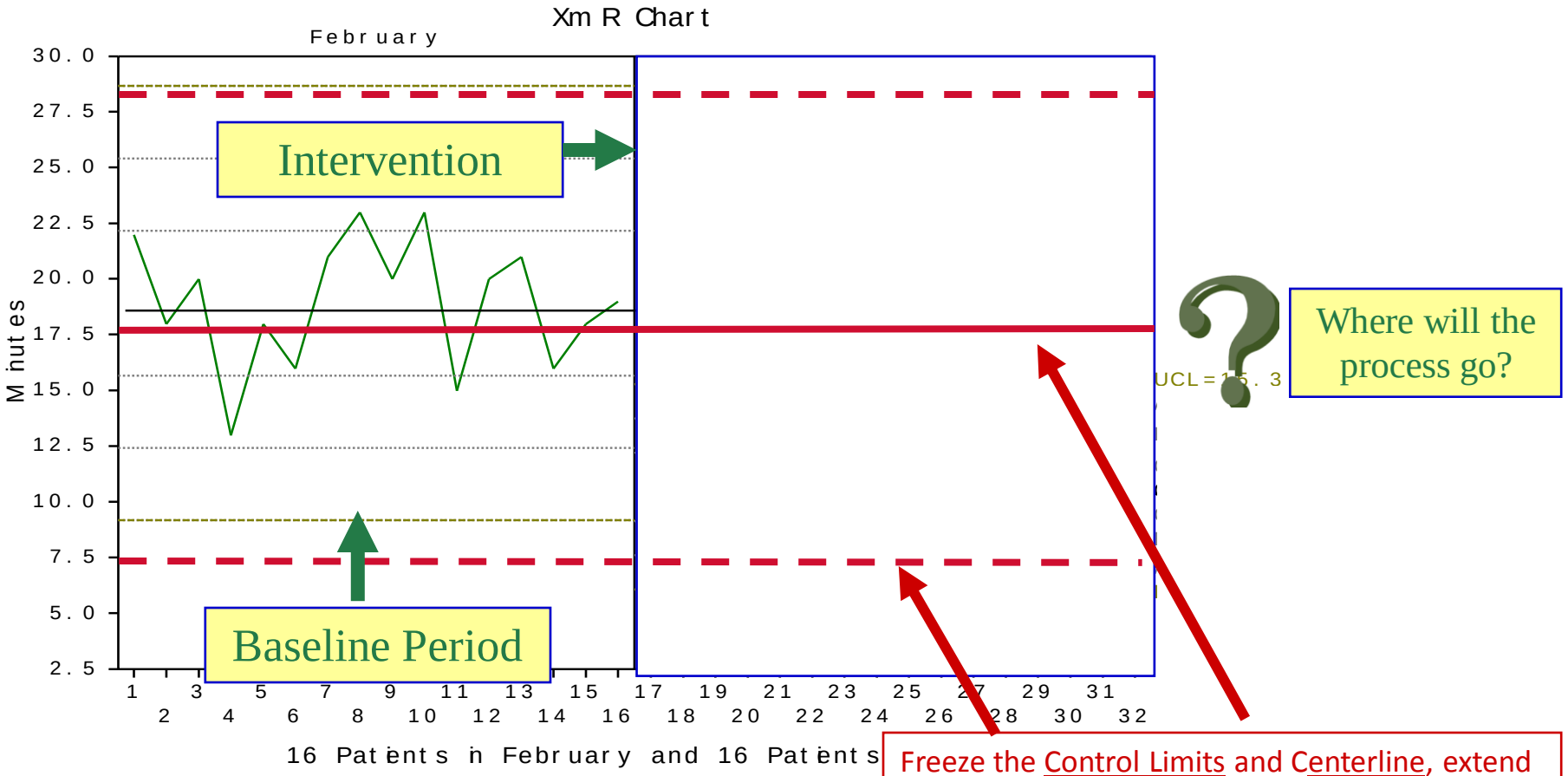
How will we know if a change results in improvement?

- By understanding the variation that lives in the data, and…
- By plotting data over time with Run and Control Charts!

Using a Control Chart to determine if we have improved wait time to see the doctor



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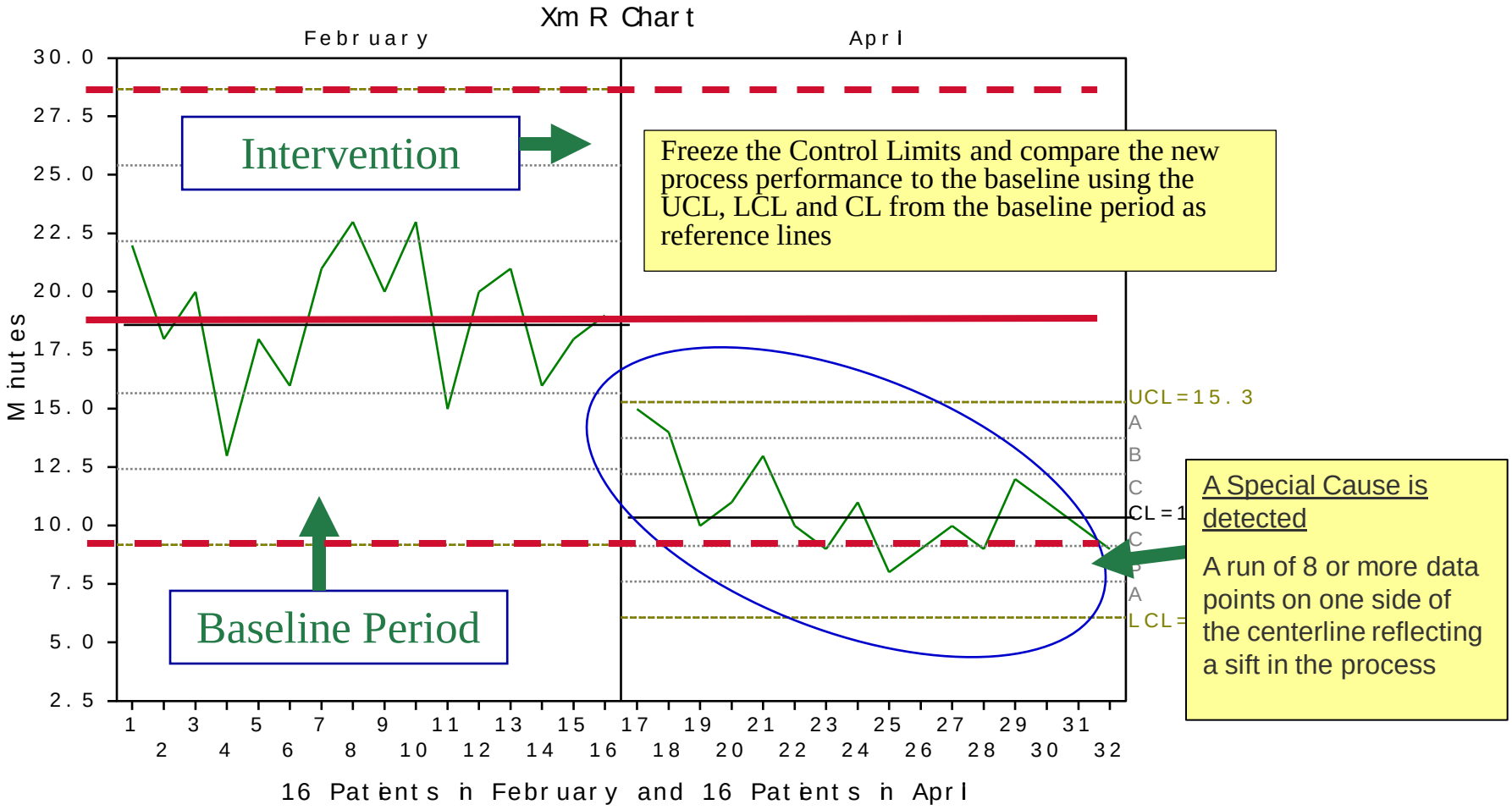

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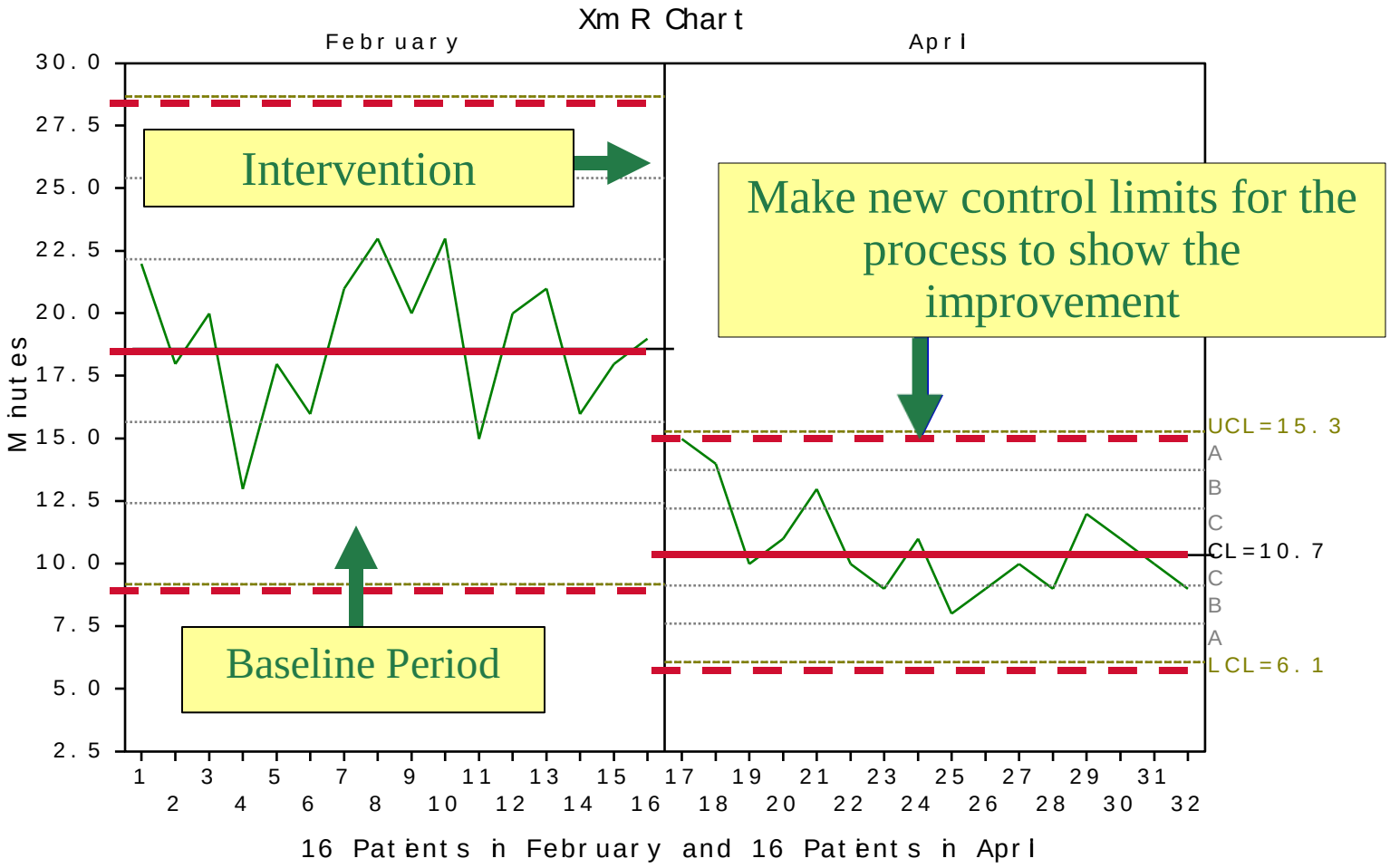
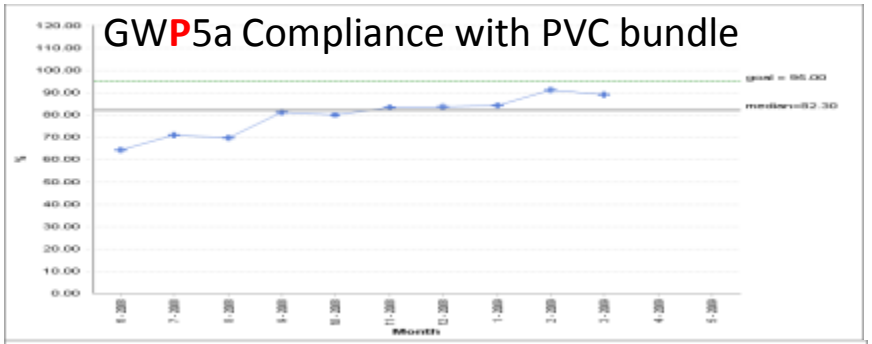
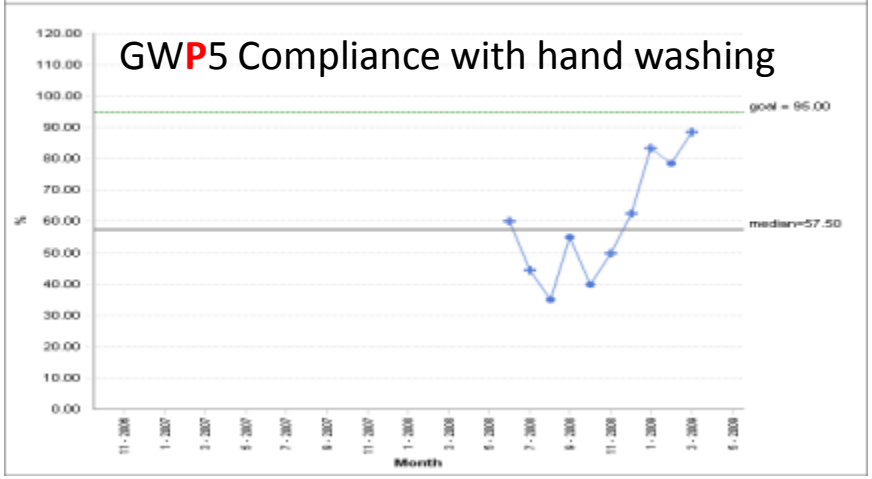
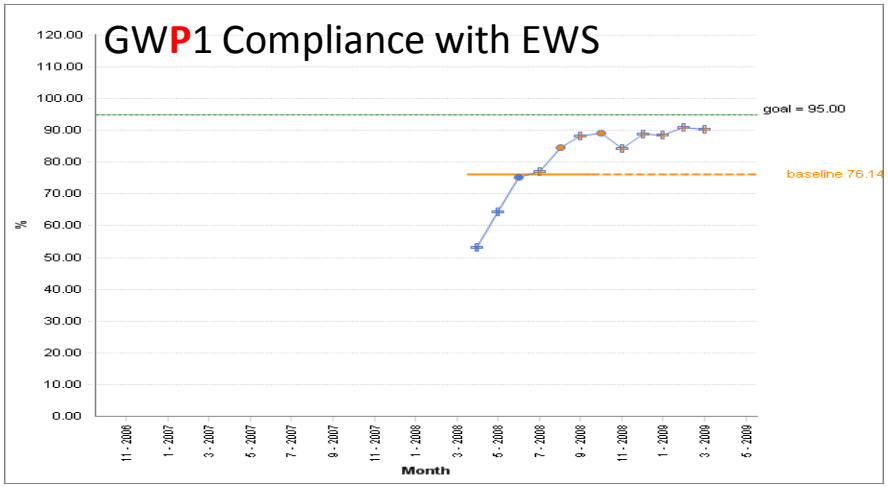
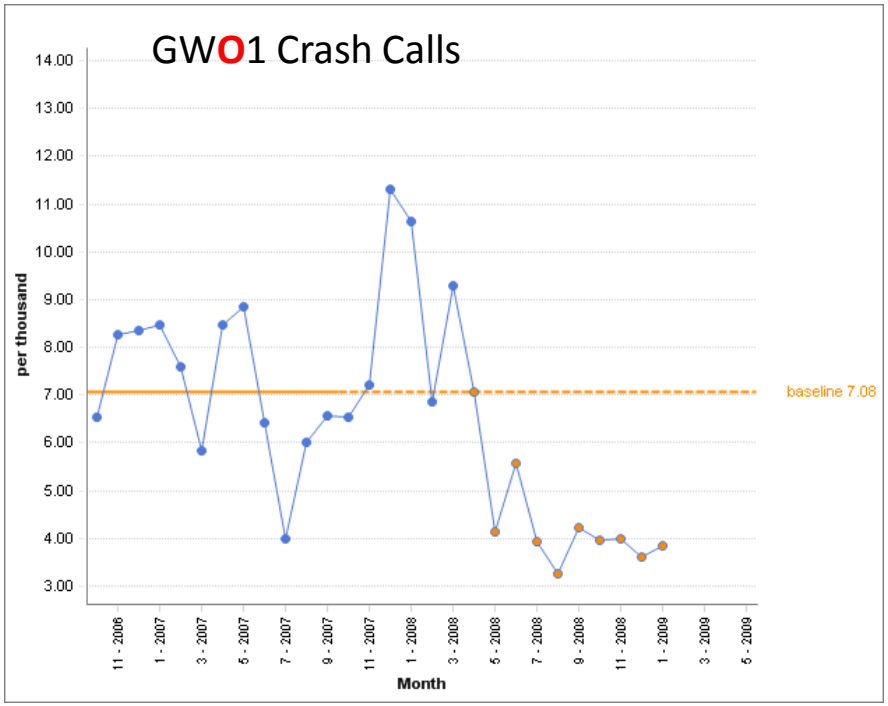


Look at Relationships is Key









Family of Measures for Reducing Avoidable Readmissions

Improvement Initiative	Outcome Measures	Balancing Measures	Process Measures
Improve transitions in care after an acute care hospitalization and reduce avoidable readmissions	All-Cause Readmission Rate All-Cause Readmissions Count Readmission Rate for a Specific Clinical Condition HCAPHS Q 19 & Q 20	Observation Status Patients Observation Status Patients within 30 days after Discharge	Enhanced Assessment of Post-Hospital Needs Effective Teaching and Facilitate Learning Post-Hospital Care Follow-up Real-Time Handover Communications

Outcome Measures	
All-Cause Readmission Rate	Percentage patients readmitted within 30 days of hospital discharge for any cause per month
All-Cause Readmissions Count	Number of all cause readmissions per month
Readmission Rate for a Specific Clinical Condition	Percentage patients readmitted within 30 days of hospital discharge for any cause with a specific clinical condition (like heart failure)
HCAPHS Q 19: Discharge preparation – Help at Home	Percentage of patients who answer, “Yes” to HCAPHS Question 19. Did hospital staff talk with you about whether you would have the help you needed when you left the hospital?
HCAPHS Q 20: Discharge preparation – Information in Writing	Percentage of patients who answer, “Yes” to HCAPHS Question 20. Did you get information in writing about what symptoms or health problems to look out for after you left the hospital?

Balancing Measures

Observation Status Patients	Number of observation status patients per month
Observation Status Patients within 30 days	Number of observation status patients per month who returned to the Hospital within 30 days after discharge

STate Action on Avoidable Rehospitalizations

An initiative of The Commonwealth Fund & the Institute for Healthcare Improvement

Key Changes	Process Measures
Perform an Enhanced Assessment of Post-Hospital Needs	Percent of admissions where patients and family caregivers are included in assessing post discharge needs Percent of admissions where community providers (e.g., home care providers, primary care providers and nurses and staff in skilled nursing facilities) are included in assessing post discharge needs
Provide Effective Teaching and Facilitate Enhanced Learning	Percent of observations of nurses teaching patient or other identified learner where Teach Back is used to assess understanding Percent of observations of doctors teaching patient or other identified learner where Teach Back is used to assess understanding
Ensure Post-Hospital Care Follow-up	Percent of patients discharged who had a follow-up visit scheduled before being discharged in accordance with their risk assessment
Provide Real-Time Handover Communications	Percent of patients discharged who receive a customized discharge plan written in patient-friendly language at the time of discharge Percent of time critical information is transmitted at the time of discharge to the next site of care (e.g., home health, long term care facility, rehab care, physician office)

Exercise: Operational Definitions

- Refer back to your Aim Statement
- Identify:
  - 1-2 outcome measures
  - 2-4 process measures
  - 1-2 balancing measures
- **Select one of the outcome measures** and write an Operational Definition that is clear and unambiguous.
- Use the ***Measurement Plan Worksheet*** to guide and record your work.

Measurement Plan Worksheet

Measure Name	**Type** (Process, Outcome or Balancing)	**Operational Definition**
1.		
2.		
3.		
4.		
5.		
6.		

See Worksheet Packet

Source: R. Lloyd & R. Scoville, IHI 2010

Operational Definition Worksheet©

Team name: _____

Date: _____ **Contact person**: _____

WHAT <u>PROCESS</u> DID YOU SELECT?

WHAT <u>SPECIFIC MEASURE</u> DID YOU SELECT F

<u>OPERATIONAL DEFINITION</u>

Define the specific com erator and denominator if it is a percent or a rate. If it is an average, e average. Include any special equipment needed to capture the data. If it isfaction score) describe how the score is derived. When a measure reflects y, complete, timely, or an error, describe the criteria to be used to determine "accurac

See Worksheet Packet

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators. Jones and Bartlett, 2004.*

Operational Definition Worksheet© (cont'd)

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators. Jones and Bartlett, 2004.*

DATA COLLECTION PLAN

Who is responsible for actually collecting the data?

How often will the data be collected? (e.g., hourly, daily, weekly or monthly?)

What are the data sources (be specific)?

What is to be included or excluded (e.g., only inpatients are to be included in this measure or only stat lab requests should be tracked).

How will these data be collected?

Manually _____ From a log _____ From an automated syste

Are these data:

Attributes data? _____ or Variables d

BASELINE MEASUREMENT

What is the actual baseline number? _____

What time period was used to colle _____

TARGET(S) OR GOAL(S) FOR T

Do you have target(s) or goal(s) s measure?

Yes ___ No ___

Specify the **External** target(s) or Goal(s) (specify the number, rate or volume, etc., as well as the source of the target/goal.)

Specify the **Internal** target(s) or Goal(s) (specify the number, rate or volume, etc., as well as the source of the target/goal.)

Dashboard Worksheet©

Measure Name (Provide a specific name such as medication error rate)	***Operational Definition*** (Define the measure in very specific terms. Provide the numerator and the denominator if a percentage or rate. Indicate what is to be included and excluded. Be as clear and unambiguous as possible)	***Data Source(s)*** (Indicate the sources of the data. These could include medical records, logs, surveys, etc.)	***Data Collection:*** •**Schedule** (daily, weekly, monthly or quarterly) •**Method** (automated manual, telephone,	***Baseline*** •Period •Value	***Goals*** •Short term •Long term

See Worksheet Packet

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators. Jones and Bartlett, 2004*

Source: R. Lloyd. *Quality Health Care: A Guide to Developing and Using Indicators. Jones and Bartlett, 2004.*

NON-SPECIFIC CHEST PAIN PATHWAY MEASUREMENT PLAN

Measure Name (Provide a specific name such as medication error rate)	***Operational Definition*** (Define the measure in very specific terms. Provide the numerator and the denominator if a percentage or rate. Indicate what is to be included and excluded. Be as clear and unambiguous as possible)	***Data Source(s)*** (Indicate the sources of the data. These could include medical records, logs, surveys, etc.)	***Data Collection:*** •**Schedule** (daily, weekly, monthly or quarterly) •**Method** (automated systems, manual, telephone, etc.)	***Baseline*** •Period •Value	***Goals*** •Short term •Long term
Percent of patients who have MI or Unstable Angina as diagnosis	Numerator = Patients entered into the NSCP path who have Acute MI or Unstable Angina as the discharge diagnosis Denominator = All patients entered into the NSCP path	1.Medical Records 2.Midas 3.Variance Tracking Form	1.Discharge diagnosis will be identified for all patients entered into the NSCP pathway 2.QA-URwill retrospectively review charts of all patients entered into the NSCP pathway. Data will be entered into MIDAS system	1.Currently collecting baseline data. 2.Baseline will be completed by end of 1st Q 2010	Since this is essentially a descriptive indicator of process volume, goals are not appropriate.
Number of patients who are admitted to the hospital or seen in an ED due to chest pain within one week of when we discharged them	Operational Definition: A patient that we saw in our ED reports during the call-back interview that they have been admitted or seen in an ED (ours or some other ED) for chest pain during the past week	All patients who have been managed within the NSCP protocol throughout their hospital stay	1.Patients will be contacted by phone one week after discharge 2.Call-back interview will be the method	1.Currently collecting baseline data. 2.Baseline will be completed by end of 1st Q 2010	Ultimately the goal is to have no patients admitted or seen in the ED within a week after discharge. The baseline will be used to help establish initial goals.
Total hospital costs per one cardiac diagnosis	Numerator = Total costs per quarter for hospital care of NSCP pathway patients Denominator = Number of patients per quarter entered into the NSCP pathway with a discharge diagnosis of MI or Unstable Angina	1.Finance 2.Chart Review	Can be calculated every three months from financial and clinical data already being collected	1.Calendar year 2010 2.Will be computed in June 2010	The initial goal will be to reduce the baseline by 5% within the first six months of initiating the project.

Outcome Measures: Readmissions				
Measure	**Description**	**Numerator**	**Denominator**	**Data Collection Strategy**
30-Day All-Cause Readmissions	Percent of discharges with readmission for any cause within 30 days	Number of discharges with readmission for any cause within 30 days of discharge Exclusion: planned readmissions (e.g., chemotherapy schedule, rehab, planned surgery)	The number of discharges in the month Exclusions: labor and delivery, transfers to another acute care hospital and patients who die before discharge	Write a report to run no sooner than 31 days **after** the **end** of the measurement month. This report will: 1a. Pull all the discharges in the measurement month 1b. Remove exclusions (transfers to other acute care, deceased before discharge, Labor and Delivery) The number of discharges after you remove the exclusions is your denominator (or "index discharges") 2a. Through the unique medical record identifier, identify those (index) discharges that resulted in readmissions within 30 days of the discharge 2b. Remove exclusions (planned readmissions like chemotherapy, radiation, rehab, planned surgery, renal dialysis) The number of (index) discharges that resulted in readmissions within 30 days will be your numerator
Readmissions Count	Number of readmissions (numerator for percent readmissions)	NA	NA	Use the numerator for the above measure
30-Day All-Cause Readmissions for a Specific Clinical Condition	Percent of discharges with a specific clinical condition who were readmitted for any cause within 30 days of discharge	Number of discharges with a specific clinical condition readmitted for any cause within 30 days of discharge Exclusion: planned readmissions (e.g., chemotherapy schedule, rehab, planned surgery)	Number of discharges in the month with the specific clinical condition Exclusions: labor and delivery, transfers to another acute care hospital, patients who die before discharge	*See above*

http://www.ihi.org/knowledge/Pages/Tools/HowtoGuideImprovingTransitionstoReduceAvoidableRehospitalizations.aspx

The Model for Improvement

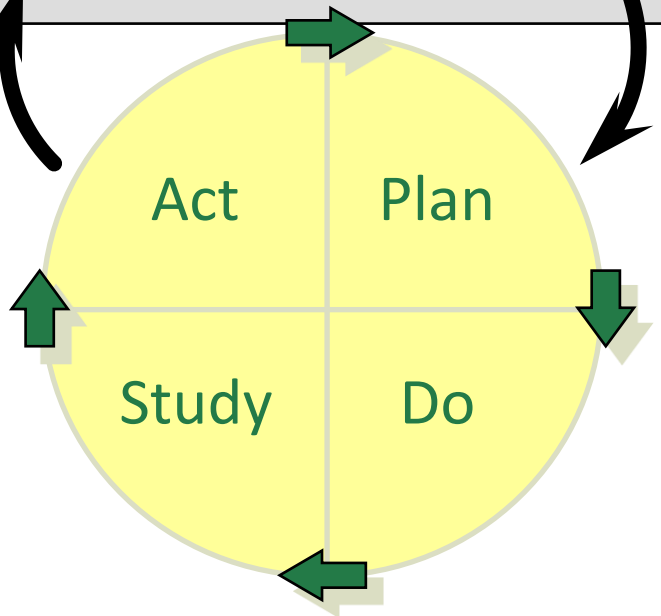
The three questions provide the strategy

What are we trying to Accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?

Question #3



The PDSA cycle provides the tactical approach to work19

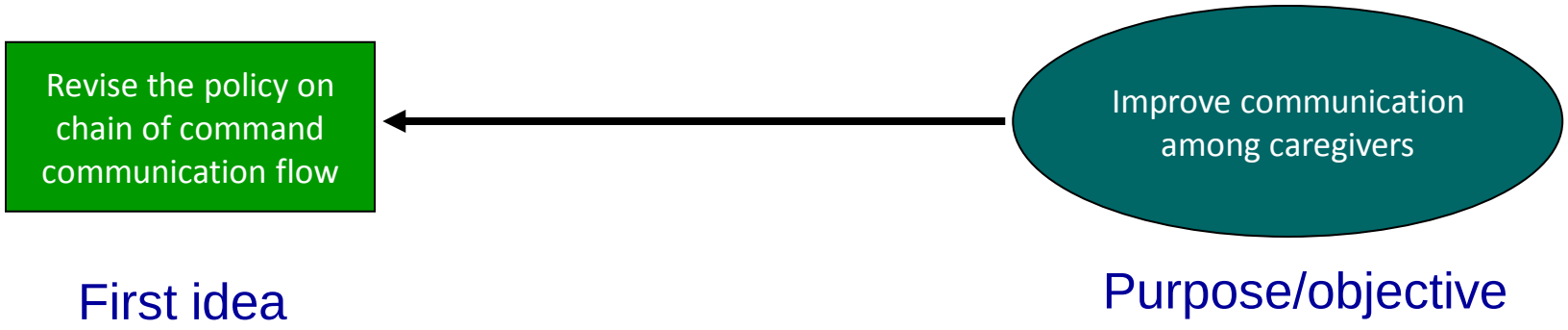
Source:

Langley, et al. *The Improvement Guide, 1996.*

How Do *You* Generate Ideas for Improvement?

- **Skills**
- **Knowledge**
- **Work experience**
- **Relationships**
- **Fitness for use**
- **Others…??**

The Concept Triangle: An Example



Change Concepts: A Good Place to Start

"A general notion or approach to change that has been found to be useful in developing specific ideas for changes that lead to improvement."

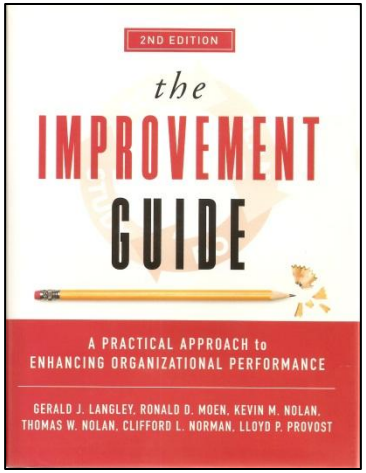
Nine general groupings of change concepts

- Eliminate waste
- Improve workflow
- Optimize inventory
- Change the work Environment
- Producer/customer interface
- Focus on time
- Focus on variation
- Mistake proofing
- Focus on product or service

Source: The Improvement Guide, p. 293

Change Concepts

The *Improvement Guide* contains an Appendix (Appendix A: A Resource Guide to Change Concepts) that describes in detail how 72 change concepts can be used to create ideas for testing.



1. Eliminate things that are not used
2. Eliminate multiple entry
3. Reduce or eliminate overkill
4. Reduce controls on the system
5. Recycle or reuse
6. Use substitution
7. Reduce classifications
8. Remove intermediaries
9. Match the amount to the need
10. Use sampling
11. Change targets or set points
12. Synchronize
13. Schedule into multiple processes
14. Minimize handoffs
15. Move steps in the process close together
16. Find and remove bottlenecks
17. Use automation
18. Smooth workflow
19. Do tasks in parallel
20. Consider people as in the same system
21. Use multiple processing units
22. Adjust to peak demand
23. Match inventory to predicted demand
24. Use pull systems
25. Reduce choice of features
26. Reduce multiple brands of the same item
27. Give people access to information
28. Use proper measurements
29. Take care of basics
30. Reduce demotivating aspects of the pay system
31. Conduct training
32. Implement cross-training
33. Invest more resources in improvement
34. Focus on core process and purpose
35. Share risks
36. Emphasize natural and logical consequences
37. Develop alliances and cooperative relationships
38. Listen to customers
39. Coach the customer to use a product/service
40. Focus on the outcome to a customer
41. Use a coordinator
42. Reach agreement on expectations
43. Outsource for "free"
44. Optimize level of inspection
45. Work with suppliers
46. Reduce setup or startup time
47. Set up timing to use discounts
48. Optimize maintenance
49. Extend specialist's time
50. Reduce wait time
51. Standardization (create a formal process)
52. Stop tampering
53. Develop operation definitions
54. Improve predictions
55. Develop contingency plans
56. Sort product into grades
57. Desensitize
58. Exploit variation
59. Use reminders
60. Use differentiation
61. Use constraints
62. Use affordances
63. Mass customize
64. Offer product/service anytime
65. Offer product/service anyplace
66. Emphasize intangibles
67. Influence or take advantage of fashion trends
68. Reduce the number of components
69. Disguise defects or problems
70. Differentiate product using quality dimensions
71. Change the order of process steps
72. Manage uncertainty, not tasks

Change Concepts Related to Eliminating Waste and Improving Work Flow

A. Eliminate Waste

1. Eliminate things that are not used
2. Eliminate multiple entry
3. Reduce or eliminate overkill
4. Reduce controls on the system
5. Recycle or reuse
6. Use substitution
7. Reduce classifications
8. Remove intermediaries
9. Match the amount to the need
10. Use sampling
11. Change targets or set-points

B. Improve Work Flow

12. Synchronization
13. Schedule into multiple processes
14. Minimize handoffs
15. Move steps in the process close together
16. Find and remove bottlenecks
17. Use automation
18. Smooth work flow
19. Do tasks in parallel
20. Consider people as in the same system
21. Use multiple processing units
22. Adjust to peak demand

Source: The Improvement Guide, p. 295

Activity ≠ Change

Is a change:

- Include ASC culture in admission pack
- Create a standing order
- Provide staff with protocol compliance feedback
- Test placement of alcohol rub dispensers

Is *NOT* a change:
(but may be a necessary preliminary task)

- Planning
- Having a meeting
- Educating staff
- Creating a protocol
- Assigning responsibility

For each change idea, you should have an explicit prediction of how it will impact the outcome.

Developing Ideas for Change

Work Area or Project: _____

Change Concept	*Specific Ideas to Test*	*Theories and Predictions as to how or why this idea will achieve the Aim*

See Worksheet Packet

Discussion Questions:

- What specific change concepts and related ideas will achieve the Aim?
- What theories and predictions can you make about how these change concepts and ideas will cause improvement?
- Use Force Filed Analysis to evaluate the ideas

Developing Ideas for Change

Improving Care Transitions and Reducing Readmissions

Change Concept	***Specific Ideas to Test***	***Theories and Predictions as to how or why this idea will achieve the aim***
Consider people as in the same system	Develop written HF educational materials to use when teaching patients in the hospital and in all clinical settings in the community	Using the same written materials will help patients and family caregivers to retain knowledge about their plan of care and self-care needs
Give people access to information	Clinicians in the hospital and SNFs co-design handover forms to accompany patients when they transfer between settings	Sending relevant information about the patient's clinical status when patients are transferred between the hospital and skilled nursing facilities will improve care
Listen to customers	Ask patients and family caregivers to share *what they are worried about when going home*	Obtaining information about what patients and family members are worried about when returning home with help the care team to initiate needed supports for the patient

Change Packages for BOOST, H2H, Project RED and STAAR

	IHI/CMWF STAAR Initiative (All Patients)	SHM Project BOOST (Geriatric Patients)	BU Medical Center / Project RED (Gen Medicine Unit Patients)	ACC/IHI Hospital to Home (Patients w/ HF or AMI)
Assessment for Post-Discharge Needs	• Include family caregivers and community providers as full partners in completing standardized assessments, planning discharge, and predicting home-going needs. • Reconcile medications upon admission. • Initiate a standard plan customized of care based on the results of the assessment.	• General Assessment of Preparedness (GAP) assessment completed with issues addressed.* • Medications reconciled with preadmission list.	• Nurse Discharge Advocate reconciles discharge plan with national guidelines and critical pathways	
Patient Education	• Identify all learners on admission. • Use "Teach Back" daily in the hospital and during follow-up phone calls to assess the patient's and family caregivers' understanding of discharge instructions and ability to perform self-care.	• Medication use/side effects reviewed using teach-back with patients/caregivers. • Teach-back used to confirm patient/caregiver understanding of diagnosis, prognosis, self-care requirements, and symptoms of complications requiring immediate medical attention. • Action plan for management of symptoms/side effects/complications requiring medical attention established and shared with patient/caregiver using Teach-Back.	• Nurse Discharge Advocate educates patient about relevant diagnoses throughout the hospital stay • Nurse Discharge Advocate reconciles the medication plan and explains how to take the meds • Nurse Discharge Advocate reviews appropriate steps for what to do if a problem arises • Nurse Discharge Advocate assesses the degree of understanding by asking the patient to explain in his or her own words the details of the plan	• Is the patient familiar and competent with their medication and do they have access to them? • Does the patient fully comprehend signs and symptoms that require medical attention and know who to contact if they occur?

Change Packages for BOOST, H2H, Project RED and STAAR

	IHI/CMWF STAAR Initiative (All Patients)	SHM Project BOOST (Geriatric Patients)	BU Medical Center / Project RED (Gen Medicine Unit Patients)	ACC/IHI Hospital to Home (Patients w/ HF or AMI)
Post-Hospital Care Follow-Up	• High-risk patients: Prior to discharge, schedule a face-to-face follow-up visit (home care visit, care coordination visit, or physician office visit) to occur within 48 hours after discharge. • Moderate-risk patients: Prior to discharge, schedule a follow-up phone call within 48 hours and schedule a physician office visit within five days.	• Telephone contact arranged within 72 hours of discharge in order to assess the patient's condition and adherence and to reinforce follow-up.	• Nurse Discharge Advocate makes appointments for clinician follow-up and post-discharge testing • Nurse Discharge Advocate organizes post-discharge services • Clinical Pharmacist calls patients 2 to 4 days after discharge to reinforce the discharge plan, review meds & solves problems	• Does the patient have a follow-up visit scheduled within a week of discharge and are they able to get there?
Discharge Communication to Patient and Care Providers in the Community	• Reconcile medications at discharge. • Provide customized, real-time critical information to the next care provider(s). • Provide an easy-to-read written plan of care to the patient and family caregivers	• Discharge communication provided to post-hospitalization care providers. • Documented receipt of discharge information from principal care providers. • Direct communication with principal outpatient provider at discharge. • Discharge education plan completed, taught, provided to patient/caregiver at discharge.	• Nurse Discharge Advocate gives the patient a written discharge plan at the time of discharge • Nurse Discharge Advocate discusses with the patient any pending in-hospital tests or studies completed and who will follow-up with results • Nurse Discharge Advocate transmits the discharge summary to physicians and services accepting responsibility for the patient's care	

Exercise:
Developing Change Concepts

- Develop several ***Change Concepts and Ideas to Test*** for your project.
- Use the ***Developing Ideas for Change Worksheet*** to record your ideas.
- Be sure to explore your theories and predictions about each change concept with those at your table.
- Spend 5 -10 minutes on this exercise.

Developing Ideas for Change

Work Area or Project: _____

Change Concept	*Specific Ideas to Test*	*Theories and Predictions as to how or why this idea will achieve the Aim*

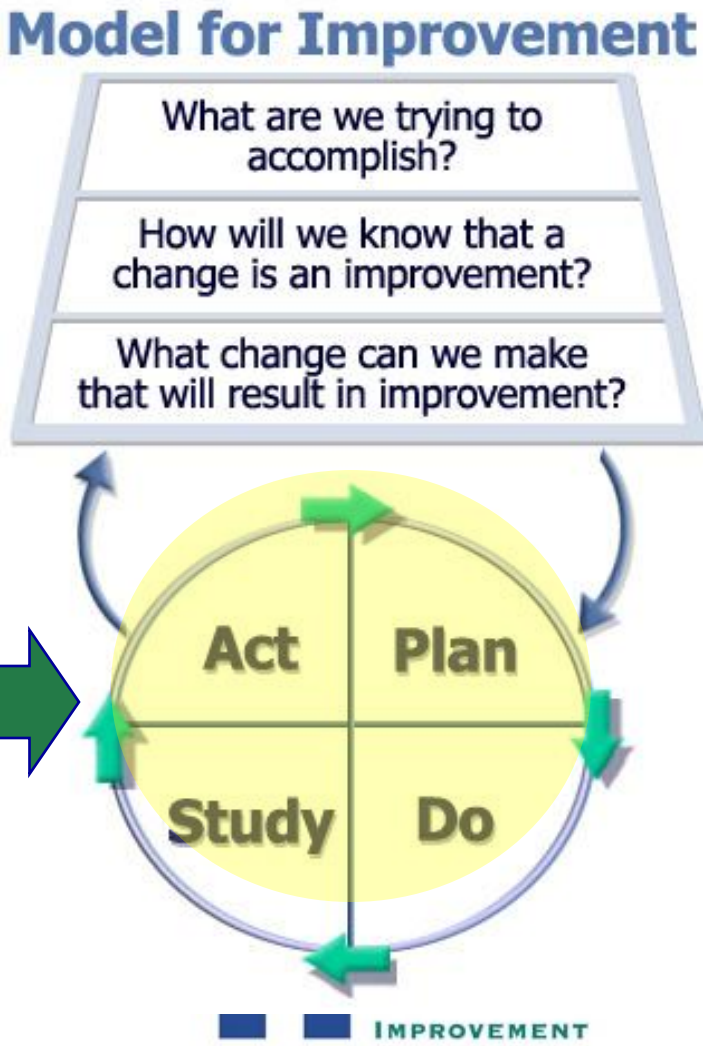
See Worksheet Packet

Discussion Questions:

- What specific change concepts and related ideas will achieve the Aim?
- What theories and predictions can you make about how these change concepts and ideas will cause improvement?
- Use Force Filed Analysis to evaluate the ideas

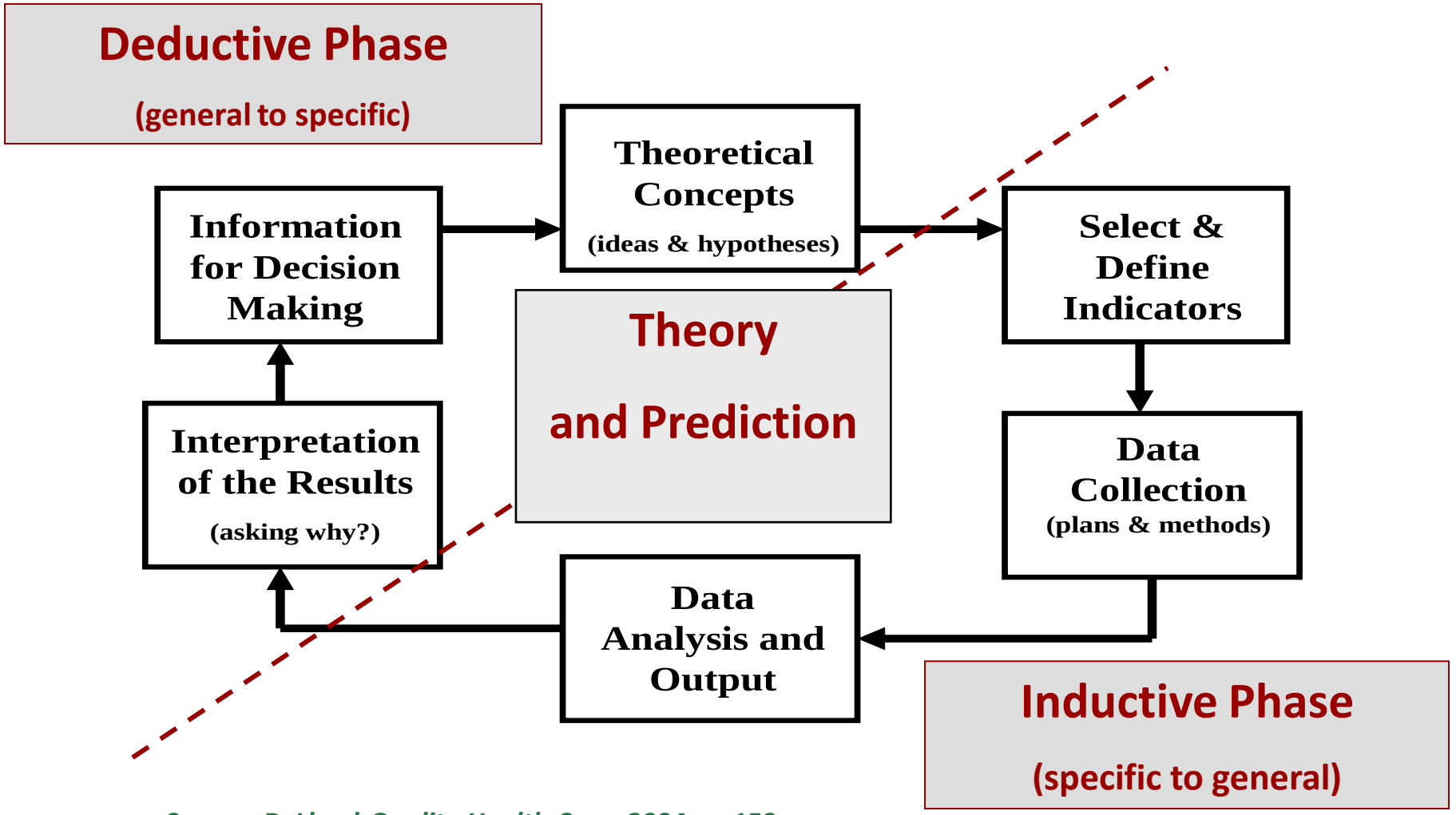
Model for Improvement & PDSAs

Now, let's focus on the PDSA part of the MFI and tests of change



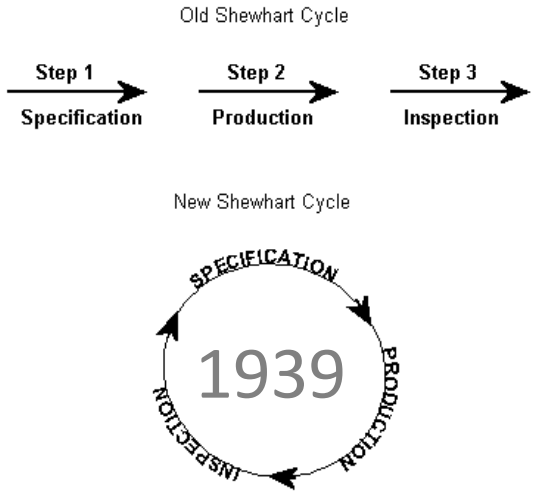
Source: The Improvement Guide, API

The scientific method provides the foundation for the PDSA cycle

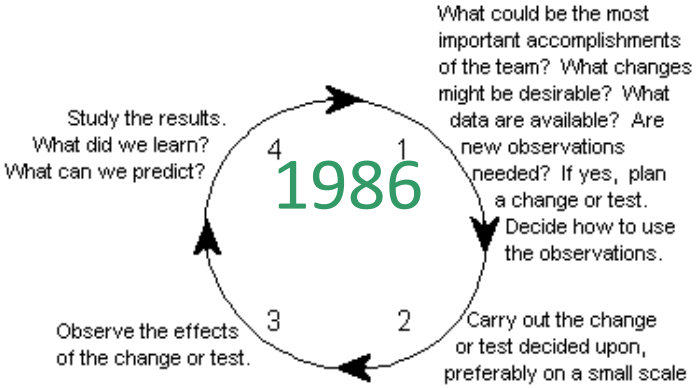


Source: R. Lloyd *Quality Health Care, 2004, p. 153.*

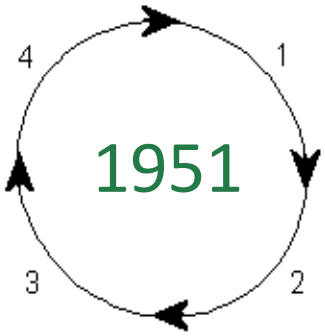
Development of the Shewhart Cycle



Walter Shewhart
(1891-1967)



Step 5. Repeat Step 1, with knowledge accumulated.
Step 6. Repeat Step 2, and onward.

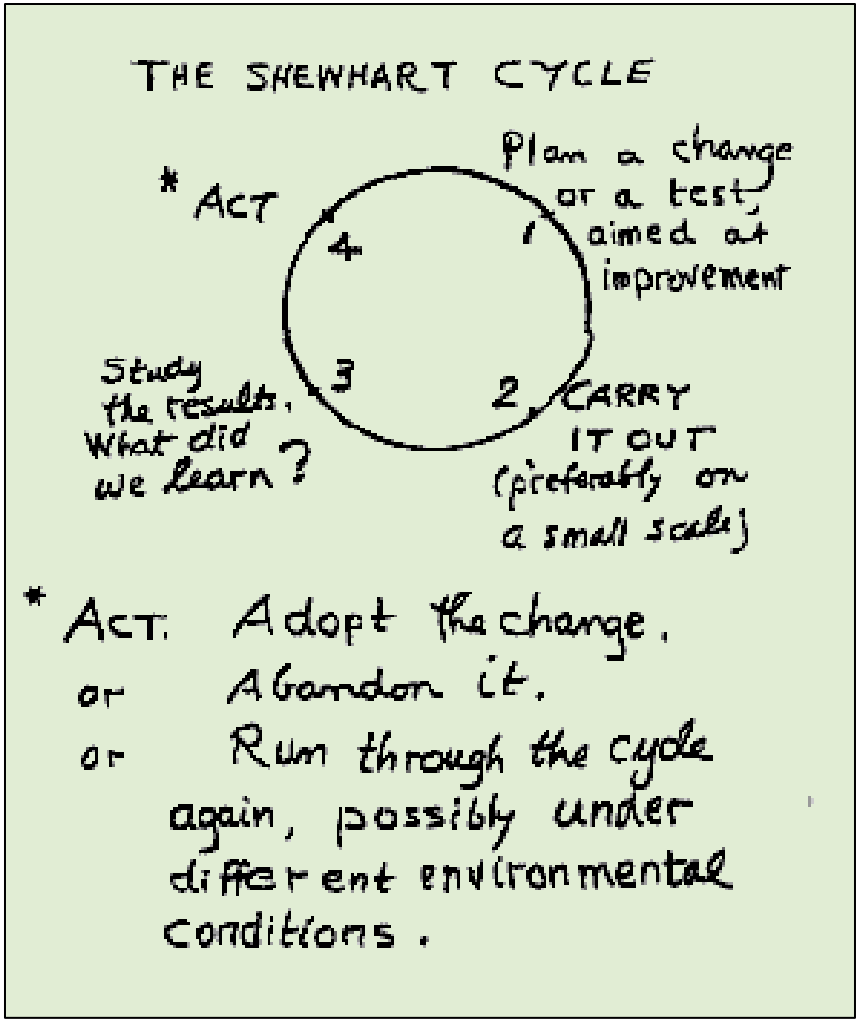


1. Design the product (with appropriate tests).
2. Make it; test it in the production line and in the laboratory.
3. Put it on the market.
4. Test it in service, through market research, find out what the user thinks of it, and why the non-user has not bought it.
5. *Re*-design the product, in the light of consumer reactions to quality and *price. Continue around and around the cycle.*

Materials courtesy of Ron Moen and Cliff Norman

Deming's Sketch of the Shewhart Cycle - 1985

Walter Shewhart
(1891 – 1967)



The PDSA Cycle for Learning and Improvement

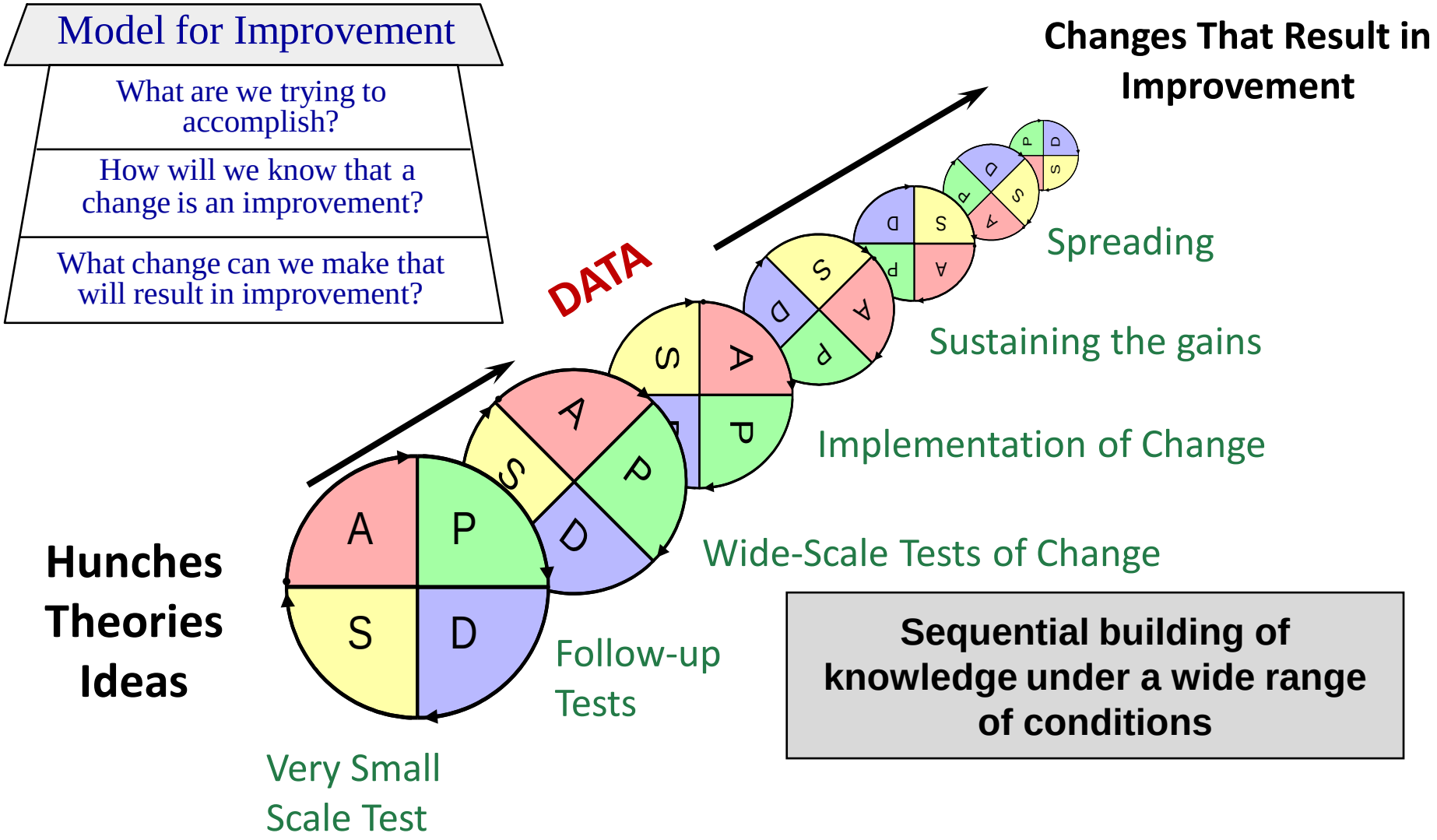
What's next?

What will happen if we try something different?

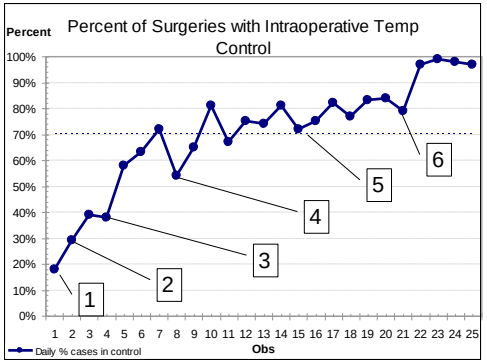
Did it work?

Let's try it!

Repeated Use of the PDSA Cycle for Testing



Change Idea: Standardize Intra-operative Temperature Control



Mini-measure tracks improvement cycles

Learning from data

99% Reliability

Cycle 6: Educate staff on new standards

Cycle 5: Standardize and document devices and protocol

Cycle 4: Analyze failures, test variation for selected surgical type

Cycle 3, Day 3: 1st OR is reliable; test with 3 ORs and surgery types

Cycle 2, Day 2: Checklist and stocking process for warming devices in OR

Cycle 1, Day 1: With 1 OR team, assign responsibility for temp monitoring

Organizing the OR team & equipment will achieve reliable temp control

Sequential Testing Builds Learning

PDSA # 1: One nurse, on one day, tests whether using Teach Back with one patient who has heart failure (HF) helps the patient learn the reasons to call the physician for help after discharge. The nurse learned that materials were confusing to the patient.

PDSA # 2: Nurse adapts the materials to better meet the patient's needs by circling key information. Uses Teach Back for all HF patients on her next shift. One patient asks to include her daughter in the teaching.

PDSA # 3: Nurse expands use Teach Back to all patients and checks with each patient to find out if there is a family caregiver they want included in the teaching.

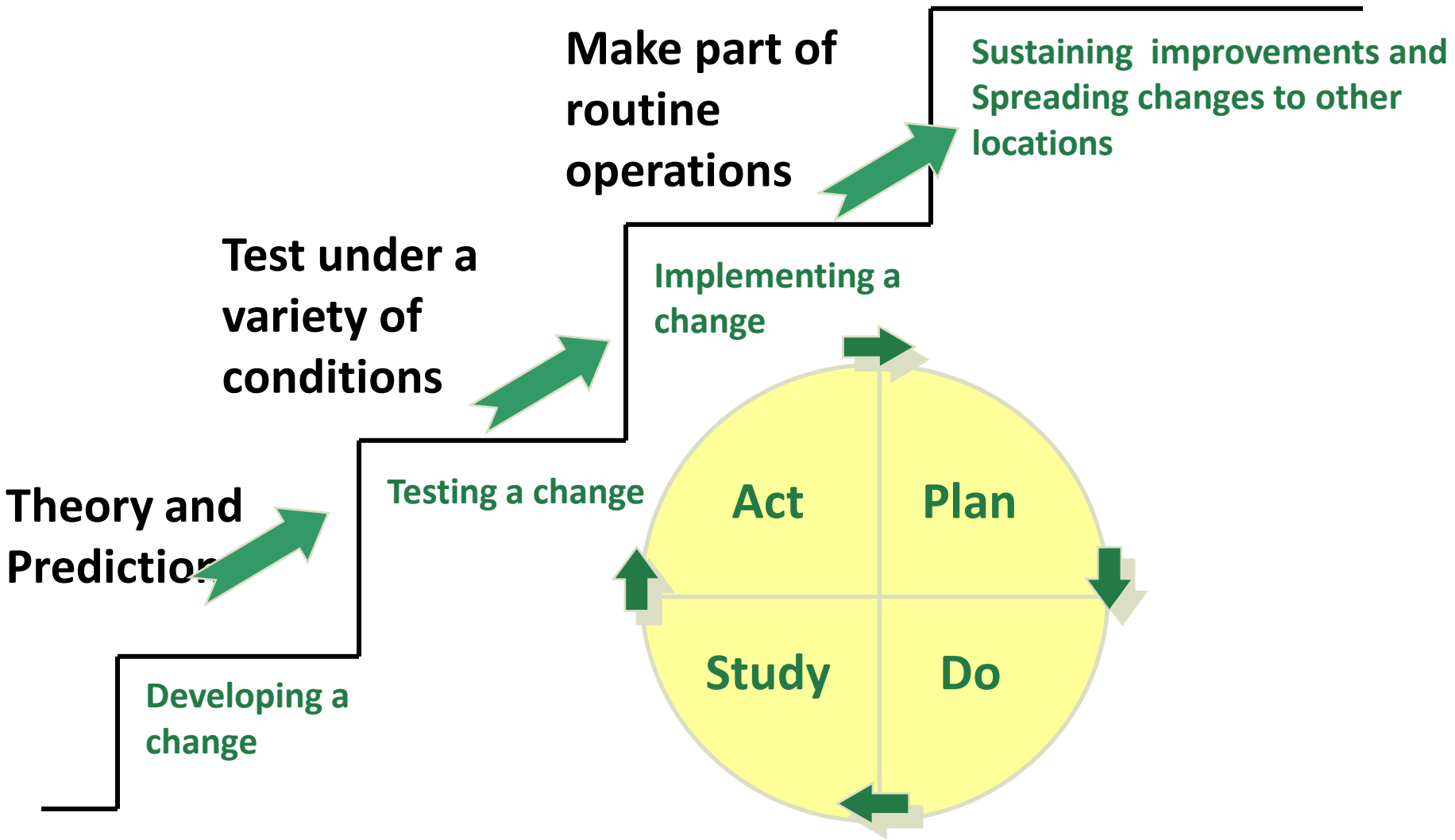
PDSA # 4: Nurse starts to train her colleagues in the method, making time to observe and give feedback to each trainee.

PDSA # 5: Educational module and competency assessment developed and tested on one group.

PDSA # 6: Module adapted and rolled out hospital-wide, including plan for new staff orientation.

Now let's put the pieces together!

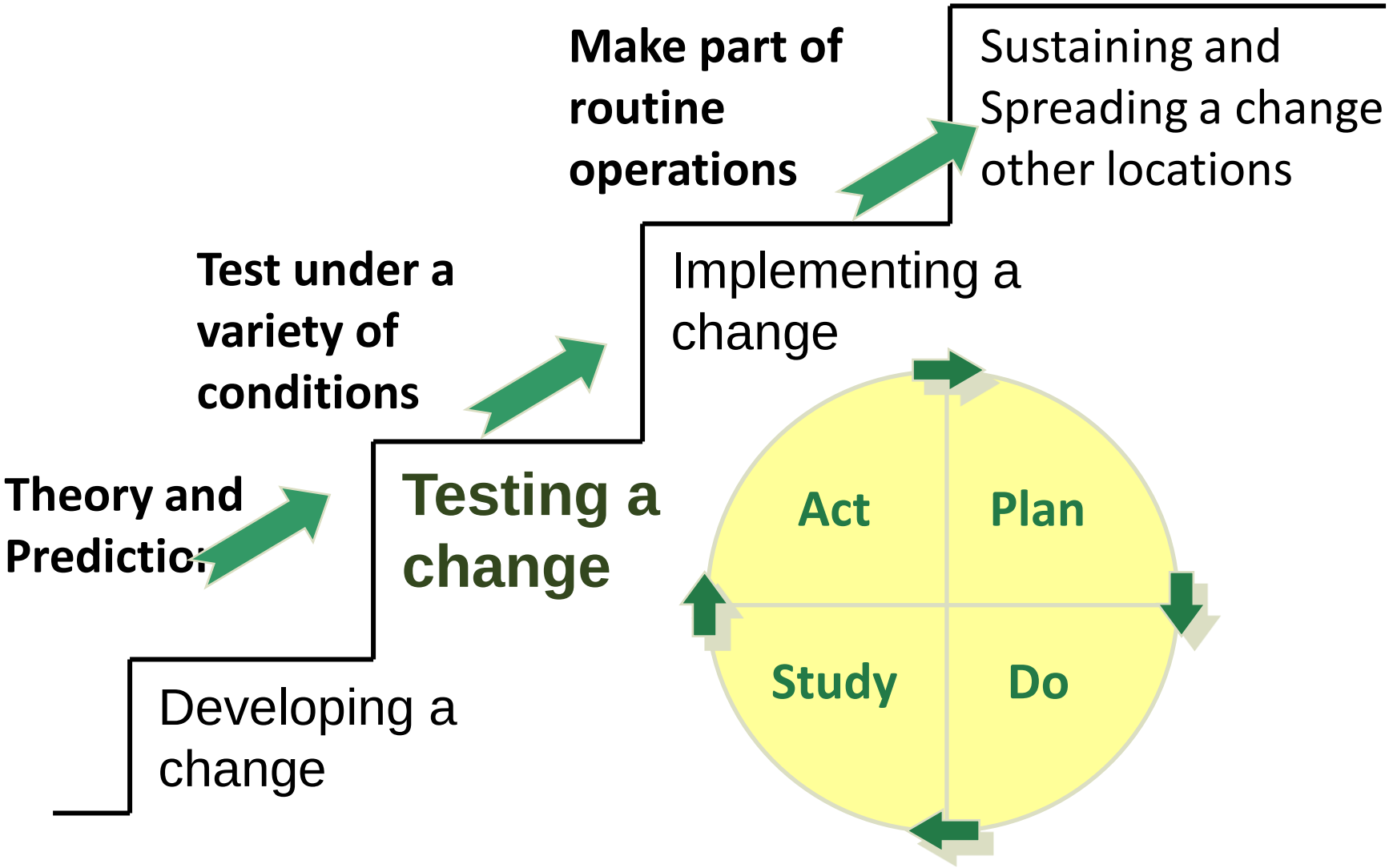
The Sequence for Improvement



Key Definitions

- **Testing**: Trying and adapting existing knowledge on small scale. Learning what works in your system.
  - Change is not permanent
  - Failure very useful here, even expected
  - Fewer people impacted than during implementation
- **Implementing**: Making this change a part of the routine day-to-day operation of the system in your pilot population
  - Don't expect failure here
  - More people impacted than during testing
  - Increased resistance compared to testing
  - Generally requires more time than testing
- **Spreading**: adapting change to areas or populations other than your pilot populations

The Sequence for Improvement



To Be Considered a Real Test

- Test was planned, including a plan for collecting data
- **Plan was carried out and data were collected**
- Time was set aside to analyze data and study the results
- **Action was based on what was learned**

Guidance for Testing a Change Concept

- A test of change should answer a specific question!
- A test of change requires a **theory** and a **prediction**!
- Test on a small scale and collect **data over time.**
- Build knowledge **sequentially** with multiple PDSA cycles for each change idea.
- Include a **wide range of conditions** in the sequence of tests.
- Don't confuse a **task** with a **test**!

Tips for Testing

"What tests can we complete by next Tuesday?"

- Use a form to document your test.
- Scale down – think "Drop Two."
- Oneness
  - 1 patient
  - 1 day
  - 1 admit
  - 1 physician
- Year
- Quarter
- Month
- Week
- Day
- Hour
- Make changes in parallel.
- Know the situation in your organization.

A Few Final Tips for Testing

- Test with volunteers.
- **Use simulation.**
- Do not agonize over getting approval, reaching consensus, etc.
- **Be innovative to make test feasible.**
- Collect useful data during each test: qualitative or quantitative.
- **As cycles proceed, test over a wider range of conditions.**

"What we gain from academic studies is knowledge.

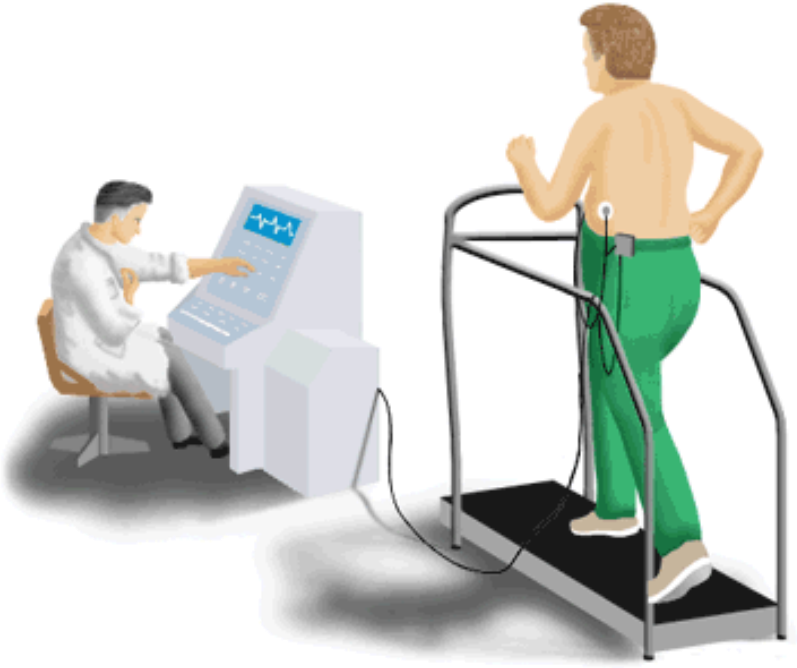
What we gain from experience is wisdom."

Mohandas Gandhi

Failed Test…Now What?

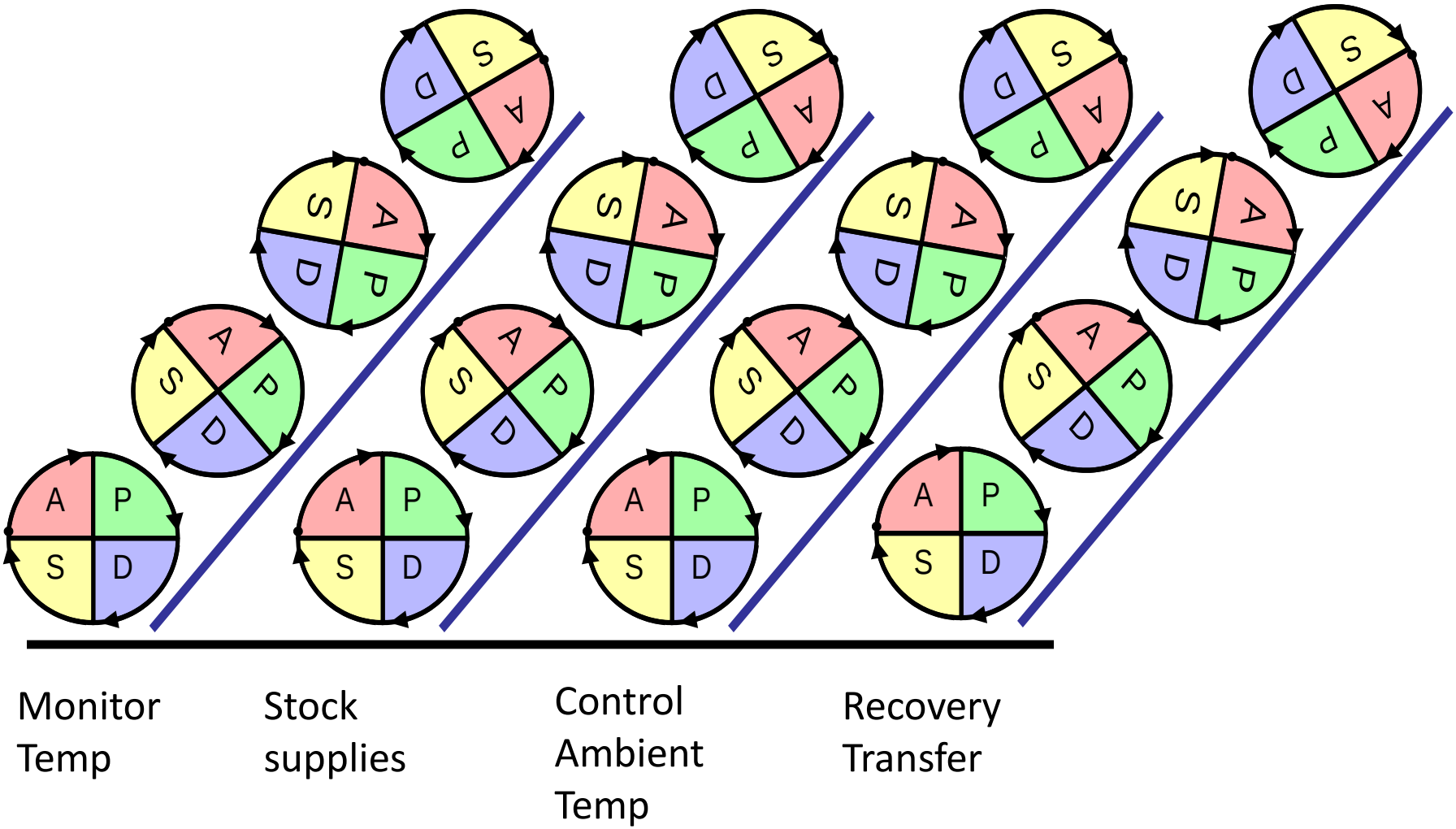
- **Be sure to distinguish the reason:**
  - Change was not executed
  - Change was executed, but not effective
- **If the prediction was wrong – <u>not a failure</u>!**
  - Change was executed but did not result in improvement
  - Local improvement did not impact the secondary driver or outcome
  - In either case, we've improved our understanding of the system!

Increasing the Pace

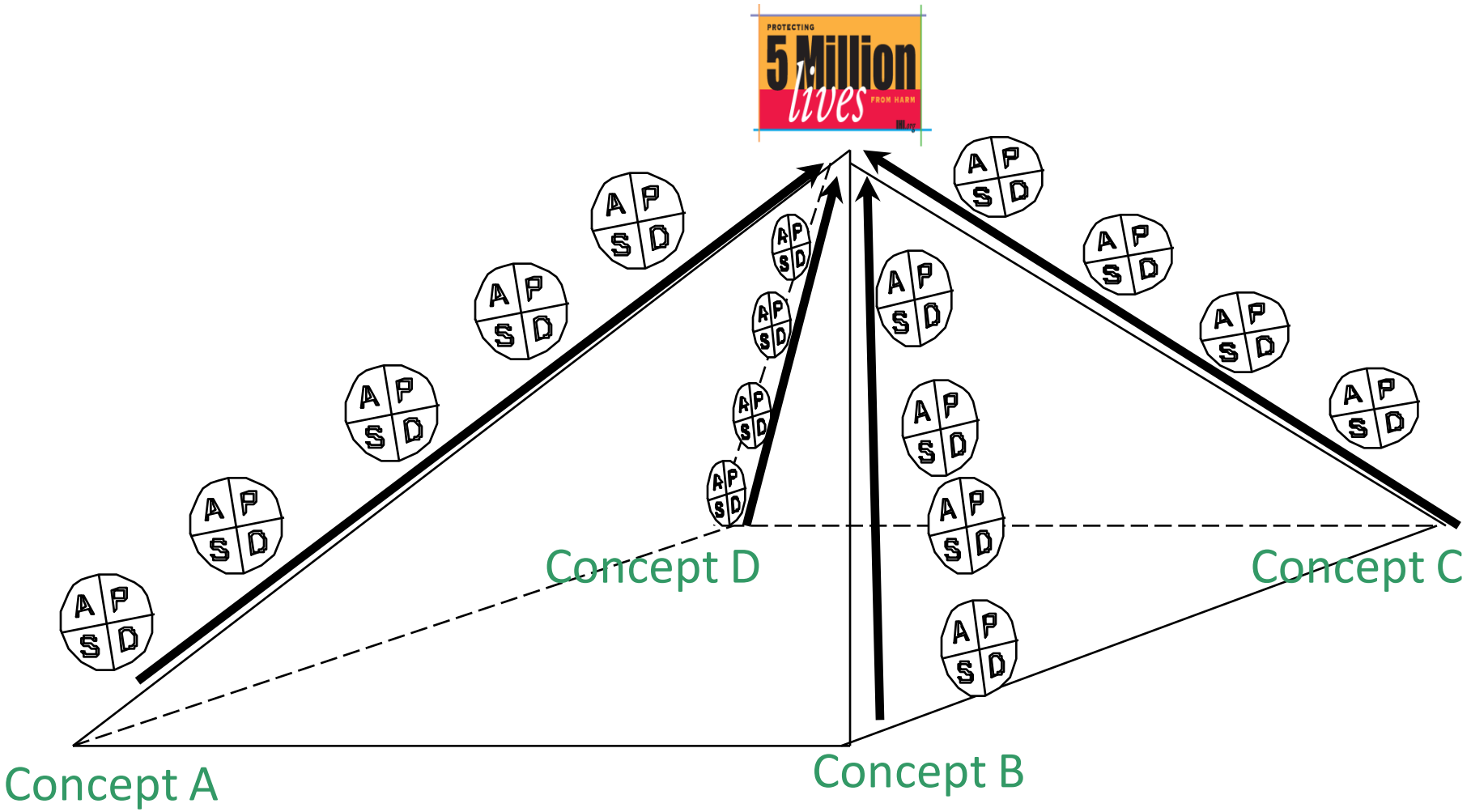


- **Smaller Scale Tests:** One patient, one staff, try it once to get started
- **Test Multiple Drivers:** Assign individual responsibility for testing changes
- **Test Multiple Change Ideas:** Work in parallel to accelerate learning
- **A Test A Day** keeps improvement in play!

Working in Parallel on Multiple Change Ideas or Drivers



Multiple Change Concepts for a Single Aim



Change Concepts, Theories, Ideas

PDSA Example

Objective for this PDSA Cycle: Improve patient understanding of self-care by using the HF zone worksheet, improve nurse teaching skills

Plan:

Questions: If we use health literacy principles and teach-back, will (1) our nurses be comfortable using the teach-back technique, and (2) our patients have a better understanding of their care?

Predictions: The nurse may have trouble remembering not to ask "Do you understand?" But the nurse will like the change, be able to use the technique, and the patient will be able to Teach Back the information.

PDSA Example (2)

<u>Plan</u> (continued):

<u>Plan to test the change</u>: Emily will talk to Jane (a nurse we know is interested in this project) and ask her to try the change. A HF patient with sufficient cognitive ability (Jane will decide) will be identified on April 28th and Jane will use HF zone handout example from St. Luke's as teaching tool; Jane will ask the patient these questions:

What is the name of your water pill?

What weight gain should you report to your doctor?

What foods should you avoid?

Do you know what symptoms to report to your doctor?

<u>Plan for collection of data</u>: Jane will write down which answers patients were able to teach back successfully and which they had trouble recalling; she will report on her experience on the May 1st team meeting.

PDSA Sample (3)

Do: There wasn't an appropriate patient on the 10th, but there was on the 11th. Jane reported to the team the next day that the patient was able to teach back three of the four questions – he had trouble remembering weight gain to report to doctor. Jane reported that she really liked the new teaching style and wanted to practice it with other patients.

Study: Jane reported that she did ask "do you understand" a couple of times and then would catch herself, but she had explained the test in advance to the patient and he liked the idea, too.

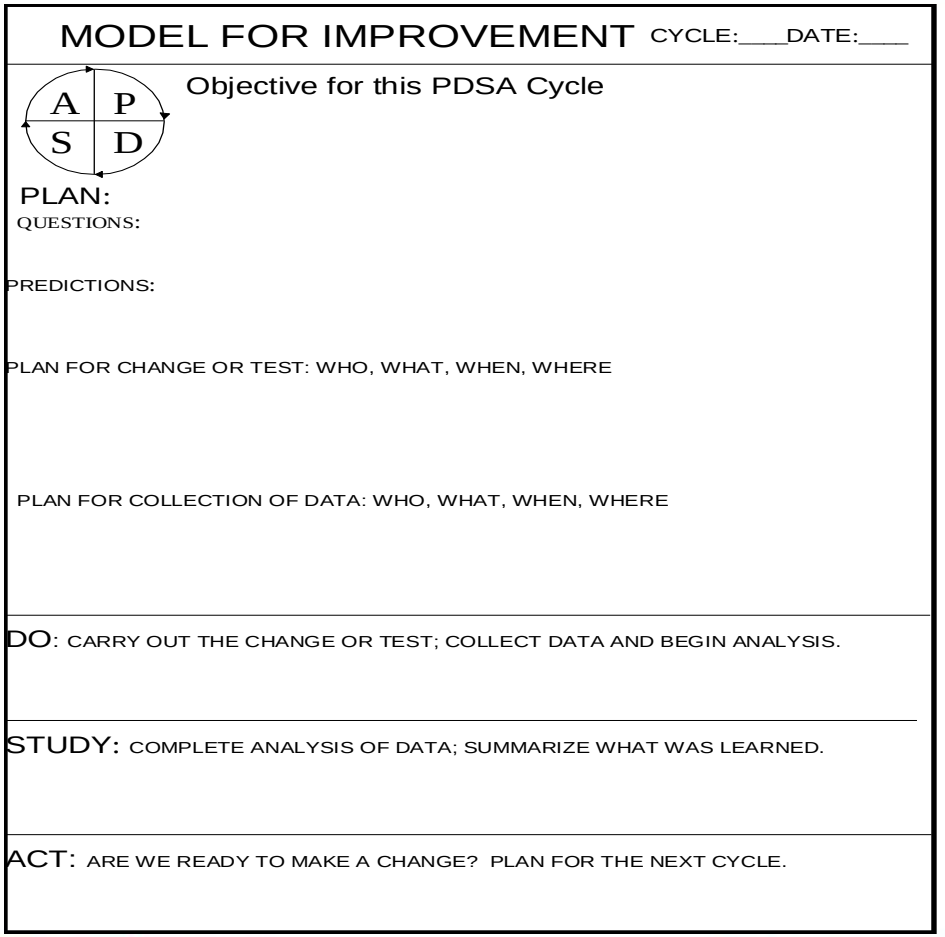
Act: Find one or more patients willing to work with Jane on redesigning patient education materials and continue to test the Teach Back technique. Jane will try on more patients and try to recruit another nurse to test with her. She will report back at next meeting. Jane will create a paper tool that will help her keep track of which items the patients teach back so that she can continue to collect the data.

Exercise
Plan Your First (next) PDSA

- Use your *Aim Statement*, *Measurement Plan Worksheet* and your *Developing Ideas for Change Worksheet* as reference materials for this exercise.
- **Select one idea from your *Developing Ideas for Change Worksheet* as an initial test of change.**
- Complete the **Plan** section of the PDSA Worksheet
- **Get feedback on your work from others at your table and be prepared to report your plan to the class.**

PDSA Worksheet

- Use this to document individual tests.
- *Remember*: It's not a test if you don't actually change the process!



MODEL FOR IMPROVEMENT CYCLE:____DATE:____

Objective for this PDSA Cycle

PLAN:

QUESTIONS:

PREDICTIONS:

PLAN FOR CHANGE OR TEST: WHO, WHAT, WHEN, WHERE

PLAN FOR COLLECTION OF DATA: WHO, WHAT, WHEN, WHERE

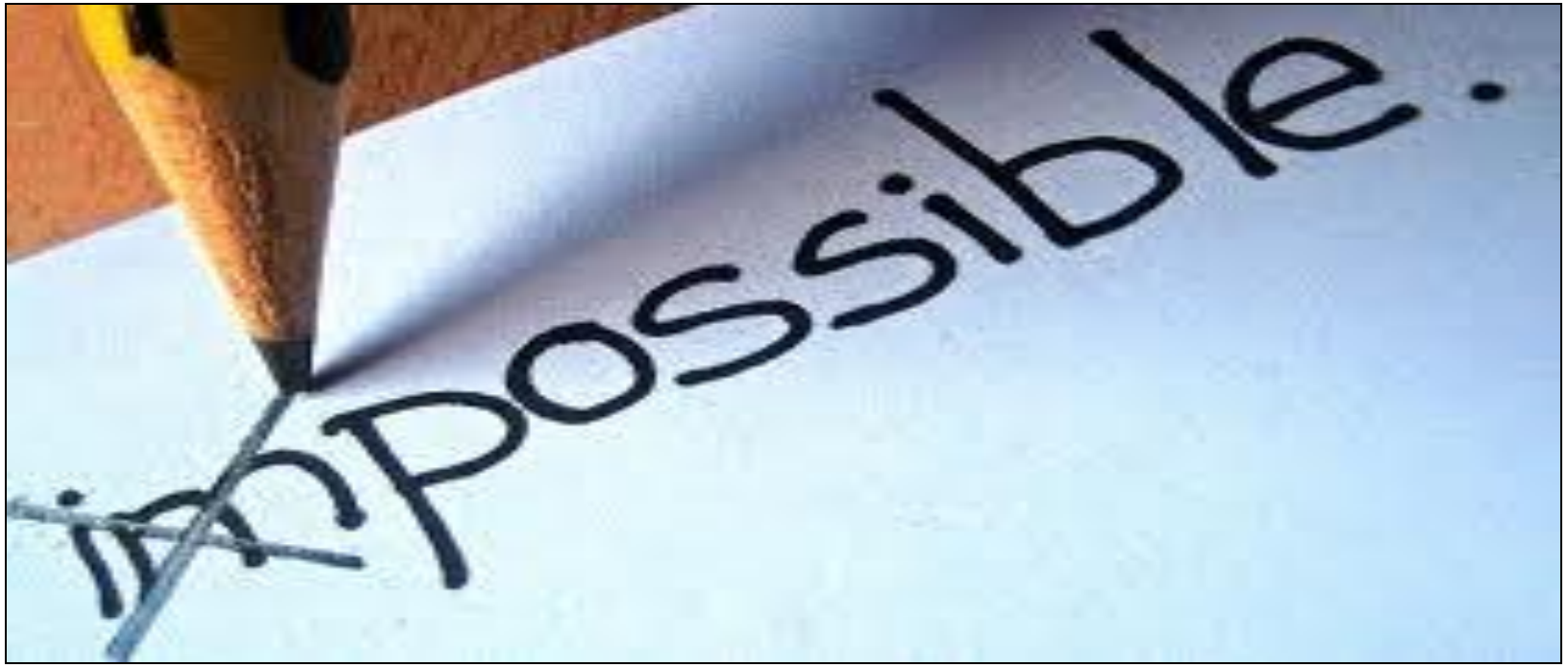
DO: CARRY OUT THE CHANGE OR TEST; COLLECT DATA AND BEGIN ANALYSIS.

STUDY: COMPLETE ANALYSIS OF DATA; SUMMARIZE WHAT WAS LEARNED.

ACT: ARE WE READY TO MAKE A CHANGE? PLAN FOR THE NEXT CYCLE.

Creating a New System

- Step One: Make improvements
- Step Two: Hold the gains
- Step Three: Spread the improvements to others



Begin with the End in Mind!

- **The Sequence for Improvement is not a linear process (i.e., do step A, then do step B, then do…)**
- **It is a dynamic process that requires ongoing evaluation and planning with the end in mind.**

So…Why Think About Spread Early in Your Project Planning?

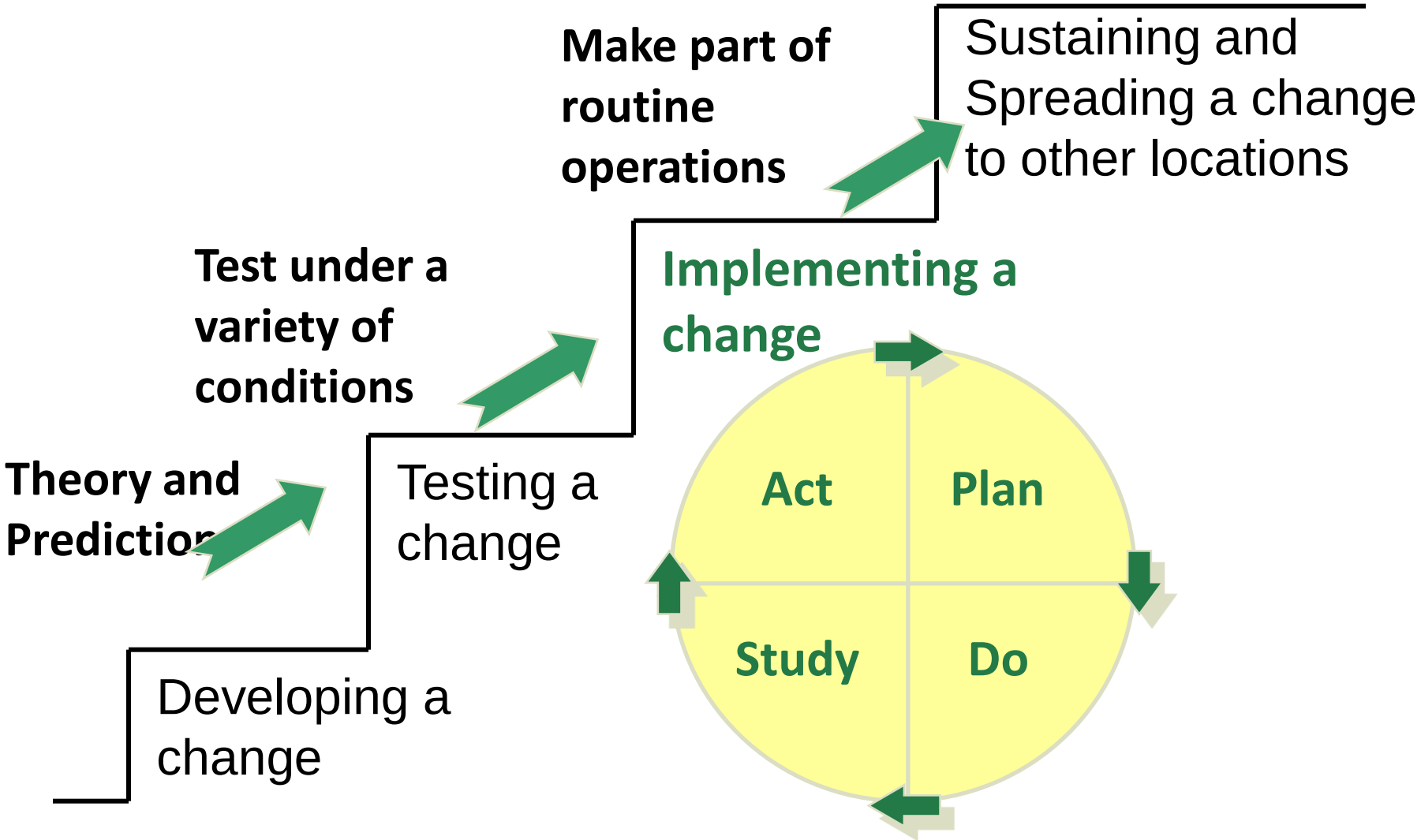
For those planning an improvement project:

- Helps identify which departments or other organizations should be included in the spread initiative

For your teams:

- Aids in team's selection of their pilot population
- Can think about who to involve and cultivate relationships for spread

The Sequence for Improvement



Testing v. Implementation

- **Testing** – Trying and adapting existing knowledge on small scale; learning what works in your system.
- **Implementation** – Making this change a part of the day-to-day operation of the system:
  - Would the change persist even if its champion were to leave the organization?

Implementation

- The change is **permanent** - need to develop all support infrastructure to maintain change
- High **expectation** to see improvement (no failures)
- Increased scope will lead to increased **resistance** (Value of evidence from successful tests)

Factors that Determine Success

Current Situation		Resistant	Indifferent	Ready
Low Confidence that current change idea will lead to Improvement	Cost of failure large	Very Small Scale Test	Very Small Scale Test	Very Small Scale Test
	Cost of failure small	Very Small Scale Test	Very Small Scale Test	Small Scale Test
High Confidence that current change idea will lead to Improvement	Cost of failure large	Very Small Scale Test	Small Scale Test	Large Scale Test
	Cost of failure small	Small Scale Test	Large Scale Test	Implement

To Implement . . .

- Use PDSA cycles to test implementation steps.
- **Establish buy–in, build consensus.**
- Create an infrastructure and support.
- **Build communication channels.**
- Create education and training.
- **Review policies & procedure.**
- Assign accountability.
- **Cultivate leadership.**

Project Name: Project Manager:

Description of change:			
Implementation dates: From to .			
Predicted impact of change on key measures:			
	Measure	Current Level of Performance	Predicted Level after Change
1			
2			
3			
4			
5			
6			
7			
8			

Processes or Products affected by the change:

	Processes or Products Affected	Process or Product Owner	Number of People Affected	Change in Standard? Yes/No	Predicted Acceptance High/Med/Low
1					
2					
3					
4					
5					
6					
7					
8					

Documentation of change:
- ☐ Materials/forms defined. Comments:
- ☐ Procedure defined. Comments:
- ☐ Equipment defined. Comments:
- ☐ Change request procedure. Comments:
- ☐ Changes in job descriptions or role statements. Comments:

Impact on training:
- ☐ Training procedure defined for implementation. Comments:
- ☐ Training resources allocated. Comments:
- ☐ Training schedule complete. Comments:
- ☐ New employee training procedure complete. Comments:

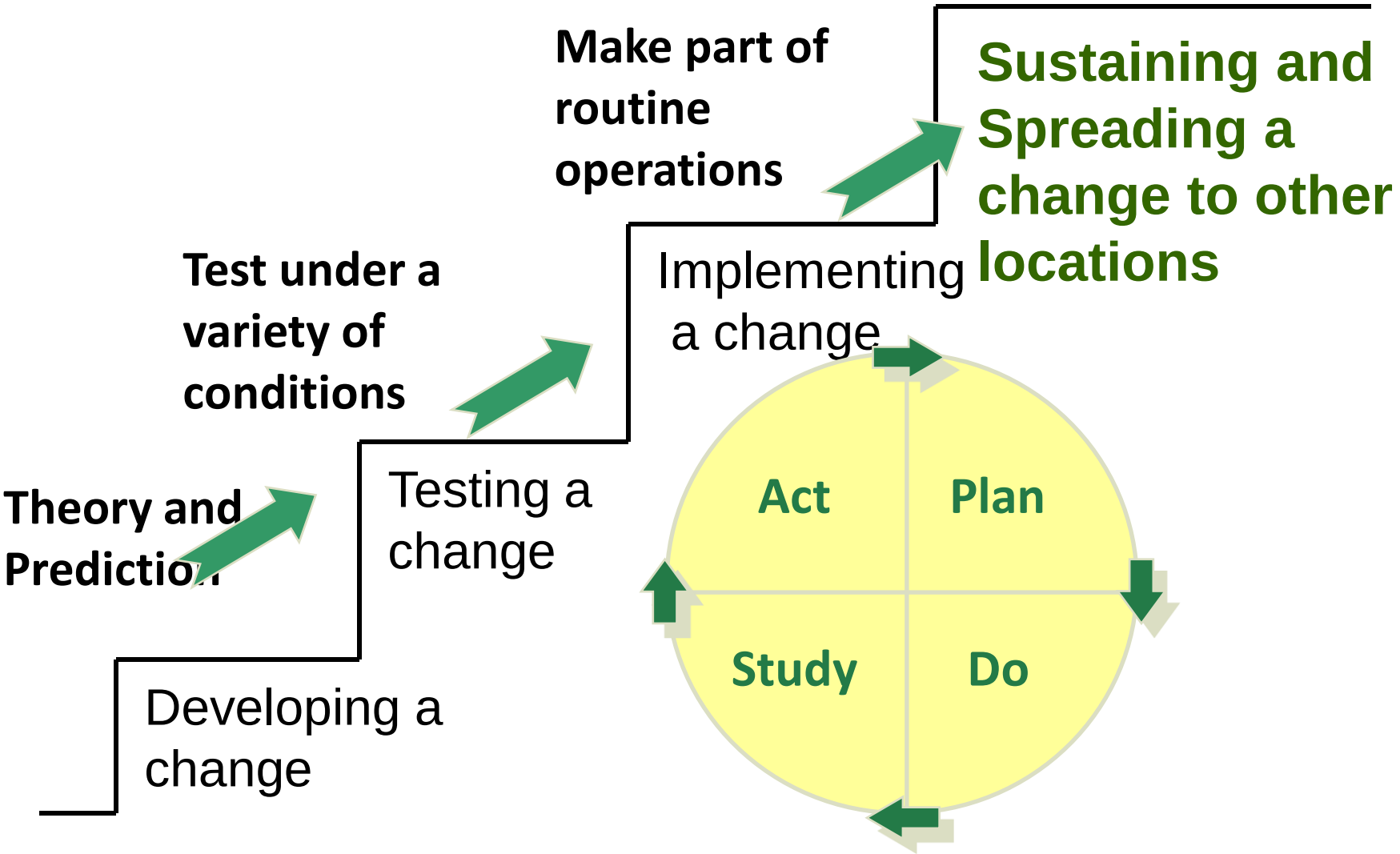
Measurements required:
- ☐ New measurements defined. Comments:
- ☐ Measurement procedures defined. Comments:
- ☐ Measurement responsibilities defined. Comments:
- ☐ Measurement review scheduled with responsibilities. Comments:
- ☐ Analysis of data responsibility assigned. Comments:

Implementation Checklist (Source: Langley, J. et. al. *The Improvement Guide*, page 136)

Implementation of Teach Back

During the testing process, a few nurses may be trained in Teach Back. Once the processes and support materials have been adapted so that these nurses teach the identified learners effectively over 75 percent of the time, those processes should be implemented across the unit. Making these processes the default system (i.e., the way the work is done rather than the way a few nurses do the work from time to time) requires a training system for all nurses currently on the unit, and changes to orientation programs for new nurses. It might also require changes to an IT system where information about education is documented and shared. Communication to all staff about the revised expectations for teaching and learning might be developed to start to generate interest in implementing the redesigned process in other parts of the hospital (e.g., in other units or service lines) or with other disciplines (like physicians, or pharmacists) in preparation for spread.

The Sequence for Improvement

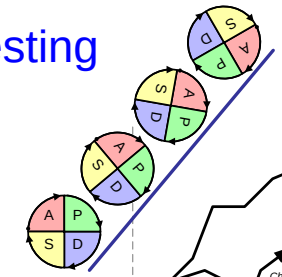


From Implementation to Spread

Local System: Unit, Sub-population, etc

Global System: Hospital, Network, Health System, All patients, etc.

Testing



Implementation

Innovation

success

success

success

success

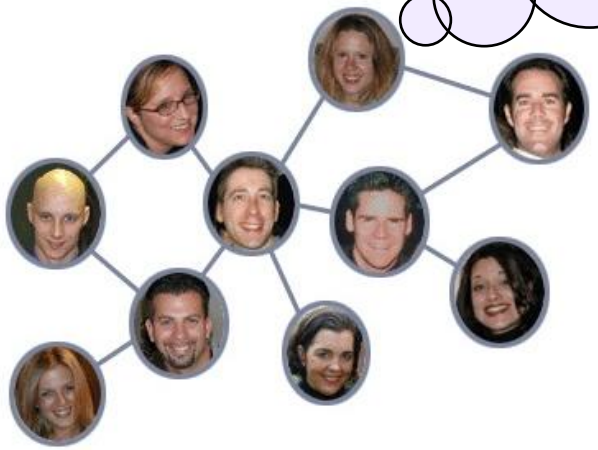
success

Spread

Stages of Adoption

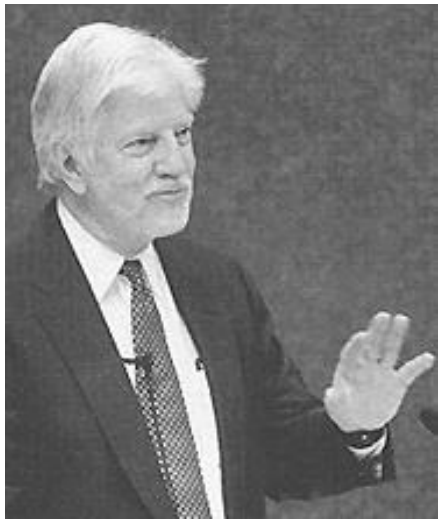
How Adopters Adopt

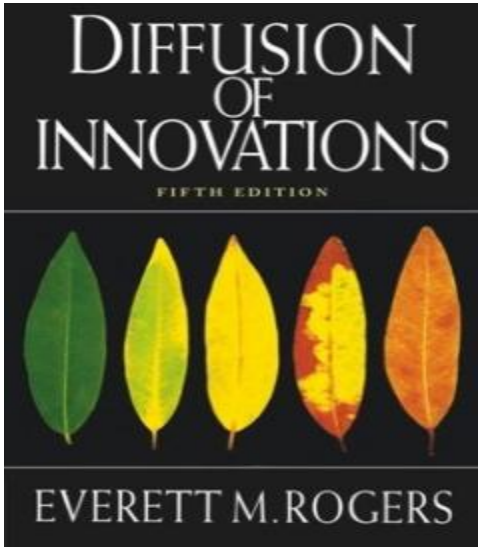
1. Awareness
2. Persuasion
3. Decision
4. Implementation
5. Confirmation



Diffusion of Innovations

A theory for understanding how people respond to innovation…





… and how to use those responses to drive needed change

Rogers, E. M. (2003). Diffusion of innovations. New York, Free Press.

How Do You Know Your Teams are Ready to Spread?

- There is an intention to spread the work of the team in the organization.
- **The topic of interest is a key initiative for the organization in the next year.**
- A Senior Leader is responsible and accountable for coordination and spread of the work of the team.
- **The team is relatively self-sufficient.**

The Seven *Spreadly* Sins

(If you do these things, Spread efforts will fail!)

Step #1 Start with large pilots.

Step #2 Find one person willing to do it all.

Step #3 Expect vigilance and hard work to solve the problem.

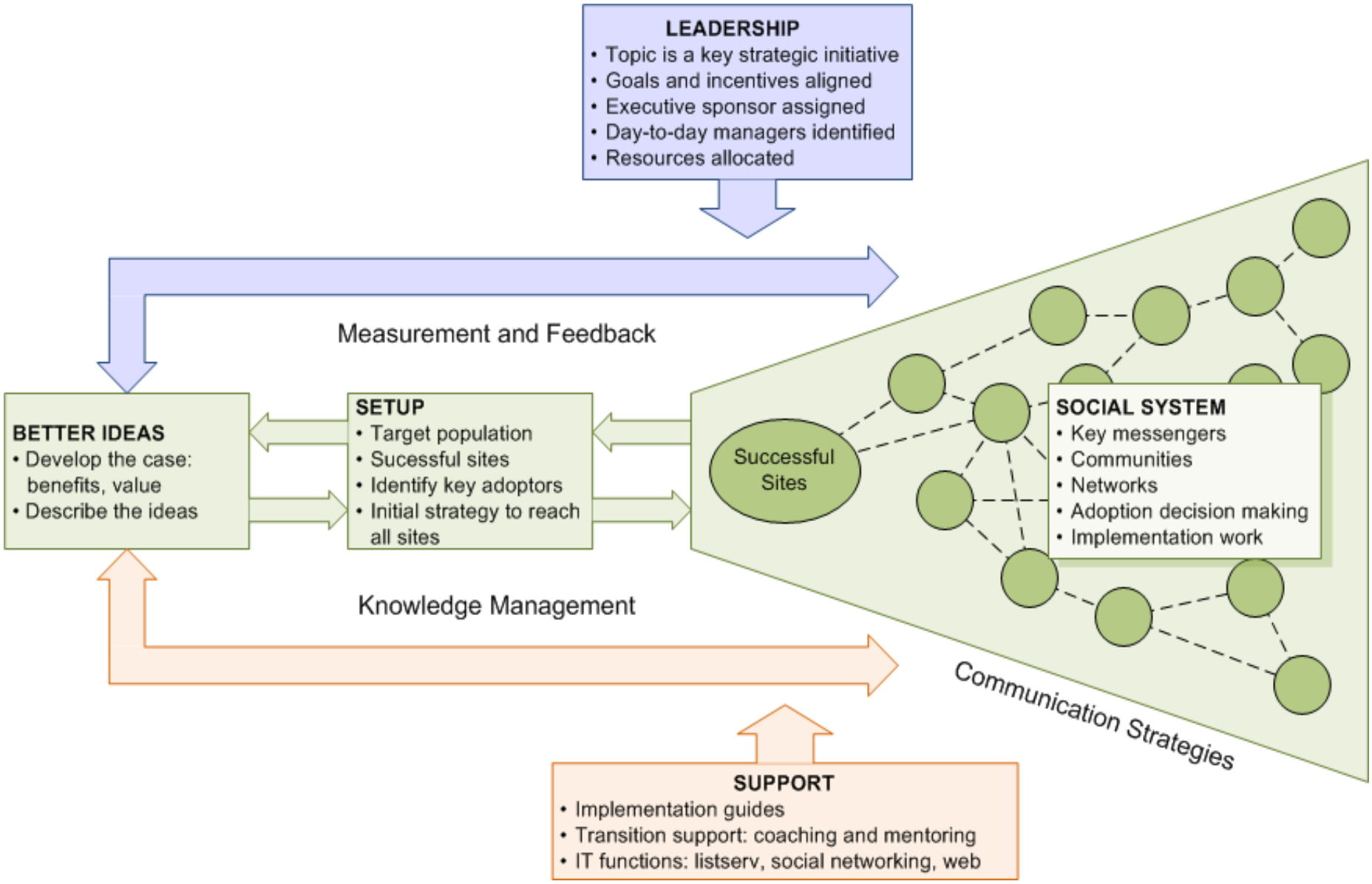
Step #4 If a pilot works, then spread the pilot unchanged.

Step #5 Require the person and team who drove the pilot to be responsible for system-wide spread.

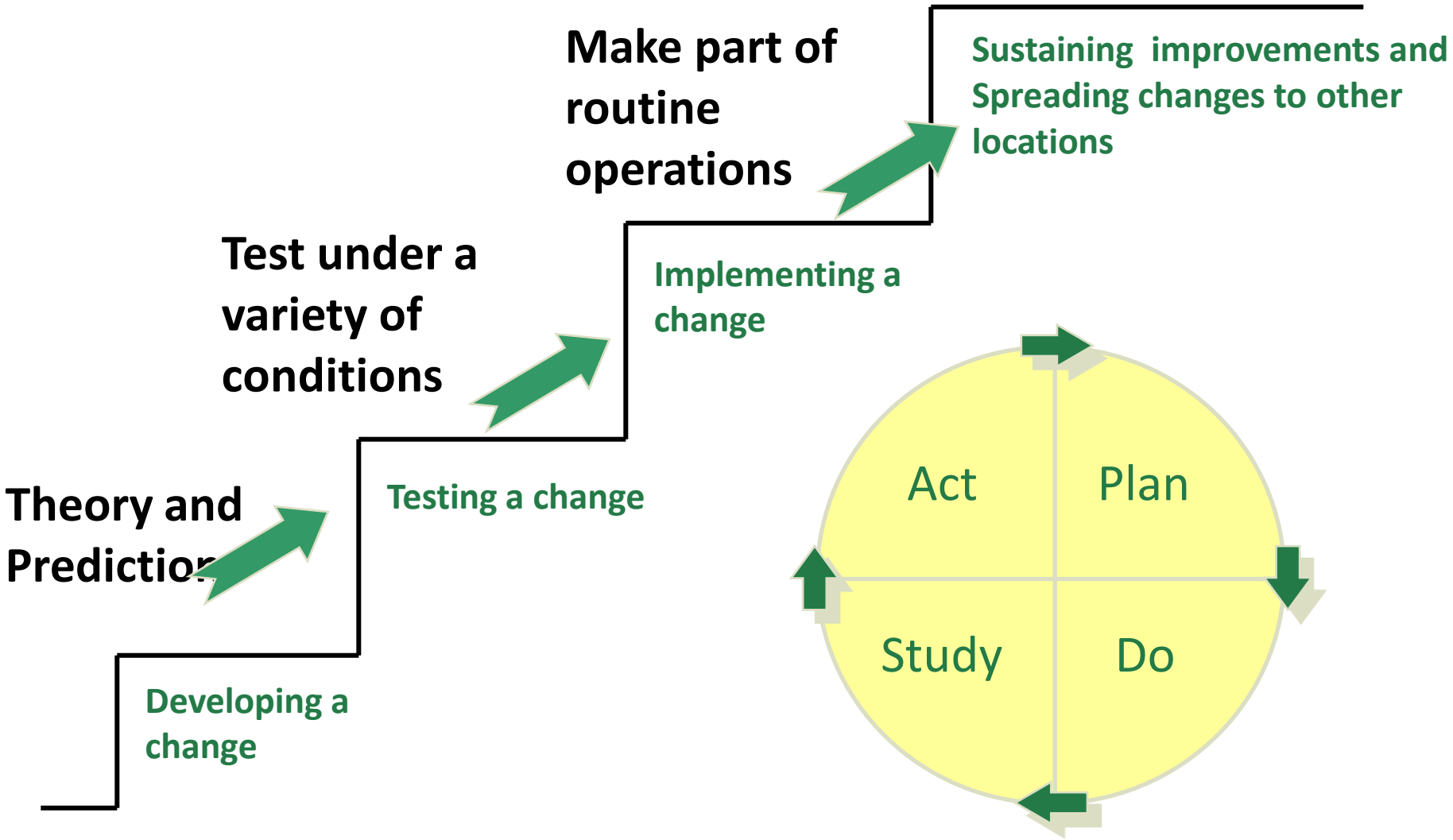
Step #6 Look at process and outcome measures on a quarterly basis.

Step #7 Early on expect marked improvement in outcomes without attention to process reliability.

The IHI Spread Model

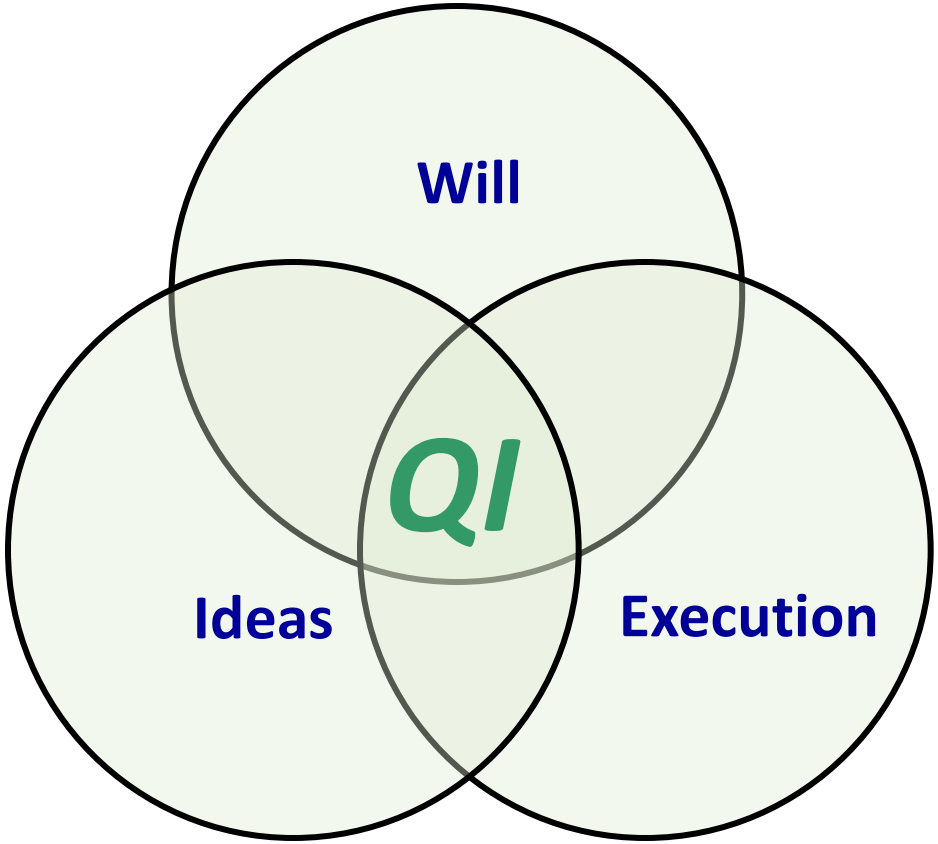


The Sequence for Improvement



The Primary Drivers of Improvement

Having the *Will* (desire) to change the current state to one that is better



Developing *Ideas* that will contribute to making processes and outcome better

Having the capacity to apply CQI theories, tools and techniques that enable the *Execution* of the ideas

How prepared is your Organization?

Key Components*	Self-Assessment
• Will (to change)	• Low Medium High
• Ideas	• Low Medium High
• Execution	• Low Medium High

***All three components MUST be viewed together. Focusing on one or even two of the components will guarantee sub optimized performance. Systems thinking lies at the heart of CQI!**

Thank you!

Good luck with your Quality Journey!

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