Co-Learning Curriculum in Quality Improvement

Part Two

February 2016

CARILION CLINIC

Learning Objectives

By the end of this workshop participants will be able to:

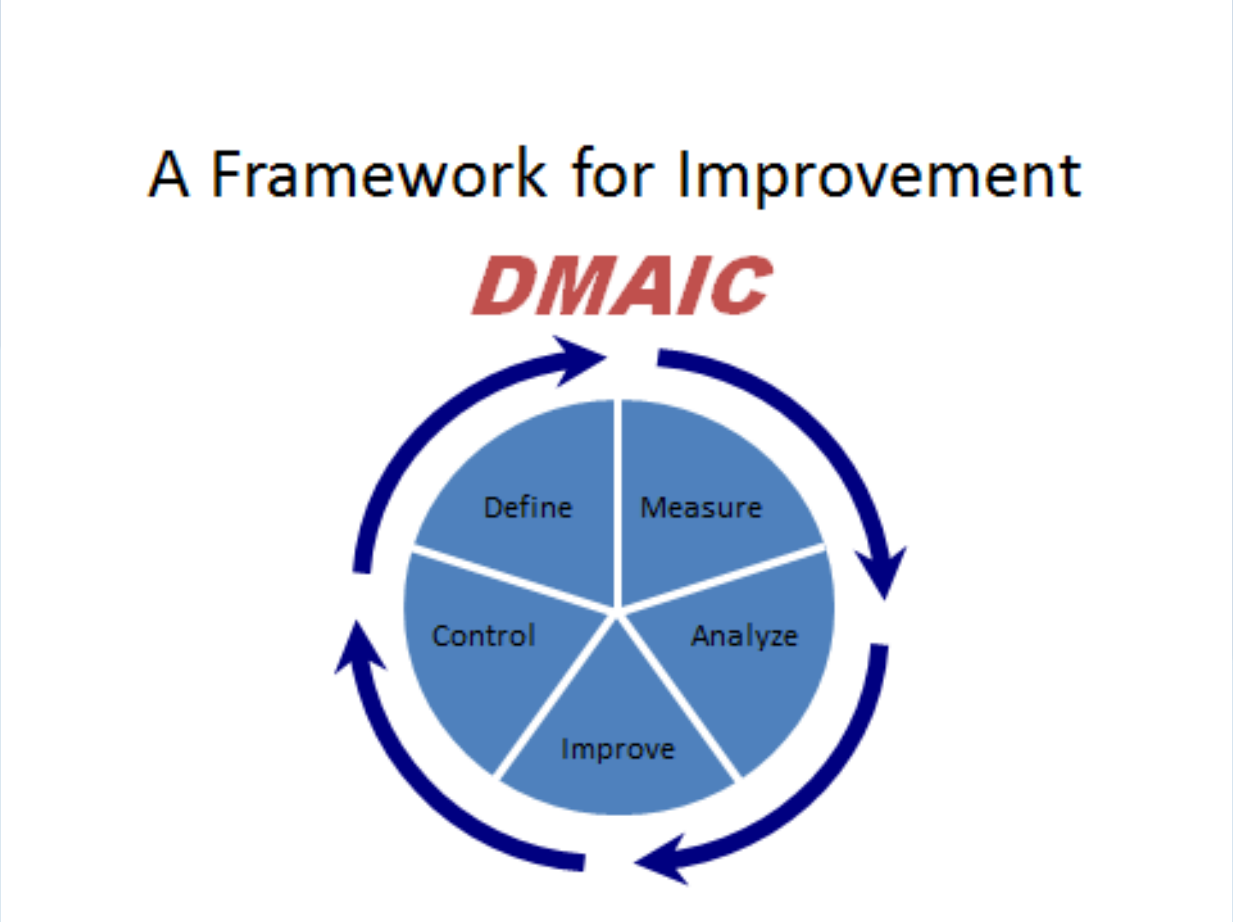
- Apply rapid cycle change methods to a QI project
- Construct and interpret a run chart
- Identify and leverage contextual factors for QI success

A QUICK REVIEW

What is QI

- Model for Improvement
- AIM statements
- Measurements in QI
- Pragmatic chart audit
- Process Tools
- Linking solutions to theories
- Stakeholder Analysis

DMAIC


A Framework for Improvement
DMAIC
Define
Measure
Control
Analyze
Improve

Workshop #2

- Introduction – Project Updates
- Improve
  - Rapid Cycle Change Methodology (PDSA)
- Control

BREAK

- Run Charts
- Implementation – Context
- Wrap-up and Evaluation

PROJECT UPDATES

- **Gazo/Dallas –Project: Reducing Blood Transfusions in the IM Residency Program**
- *Basic Structure: comparing the same months (~October-March) between 2014-2015 and 2015-2016; our "intervention" is multi-pronged, primarily Dr. Dallas's lecture to IM residents as well as Grand Rounds; as well as posters placed around the hospital in high-traffic areas (not just for IM residents but we will be looking at IM residents for our smaller part of the project). Literature review largely completed by our M2, Kami Arulraja.*
- *Outcomes: total number of transfusions by all IM residents (n=54) to be reduced from 14/15 to 15/16; sub-group analyses to be determined based on what the data eventually tells us.*
- *Overall message is to encourage deeper thought when it comes to blood transfusions than already exists.*
- *Potential roadblocks - the data as it comes from the EPIC people is awfully unwieldy. Will need to address this before time is short before presentation day.*
- *Was hoping to be further along in terms of analyzing last year's data over the selected timespan to be able to work out any unforeseen kinks ahead of time, but haven't been able to do this yet.*

PROJECT UPDATES

- **Kingston/DeMott – (morning rounds impact)**
- *actively giving feedback to presenters during morning report teaching sessions that we are collecting. Additionally we plan to have a post-intervention survey that will be sent out this spring to presenters and to audience to complete. This will analyze the changes we have been implementing over the intervention period to report our findings.*

PROJECT UPDATES

- **Schmidt/Beirne – (diabetes A1C tracking)**
- *My team is focusing on increasing compliance with blood sugar logs. Overall, our group sample size has been fairly small with very little positive response. We do seem to be having a more positive response as time continues which is to be expected as more people become educated on using blood glucose logs. We are in the final month of our data collection and should begin analyzing our data within the next month.*

PROJECT UPDATES

- **Clark/Klawonn – intervention has begun (weight loss goal tracking)**
- *The QI project assessing whether adding goals sheets to Dr. Klawonn's weight loss clinic project has been basically unchanged. The baseline period of data collection was Nov-Dec and she rolled out her goals sheets in January. We will collect data through the end of February and assess whether weight loss and the patient's satisfaction to the process was improved. We will be measuring weight loss average per month among all patients and compare Nov & Dec to Jan & Feb. From this we will be able to gain some insight if there are improvements we can make to the goals sheets, assuming they do improve outcomes and patient satisfaction.*

PROJECT UPDATES

- **Icard/Kroker-Bode –Tracking increase in error reporting**
- *Overall, our intervention months went very well through the months of October, November and December. During this time our team rounded with the internal medicine service, met individually with each resident, gave weekly reminders about 7-SAFE and SoftMed Reporting during morning report and in resident gathering places. Our goal was to see a 100% increase in the number of events reported by residents during these months in comparison to the previous year. We were able to achieve this goal. However, looking at the data in a continuum you can see that the interventions need to be sustained over time to see the greatest effect. As soon as the interventions slacked there was a decrease in the event reporting.*

PROJECT UPDATES

- **Pizza/Patel – Reducing Family Medicine Admission rates**
- *Update: As you know we wasted a lot of time and energy with out first transition of care QI project involving heart failure. Due to existing heart failure QI projects we were steered away from this after multiple team meetings and the first QI training session academic half day. Once we regrouped we came up with reducing Faculty Medicine Admission rates. There was a much longer than expected delay in getting approval for our project after we submitted our QI/QA IRB application, which set us back further. We started our project Block 6. As Block 7 was the holiday block and there were three separate teams over this one month period it was difficult to reach out to teams to work on improving admission times with any real consistency. This really only leaves Block 8 left until we have to present our findings, which simply is not enough time. Kristen Gorman has been a great asset on data collection; I have met with her a couple of times to figure out what data is being looked at and how to best measure admission times. As hard as she works there just is not enough time for her to sort out the very complex and detail oriented data collection that needs to be done coordinating with multiple other groups that she is working with to address the problem of delayed hospital admissions. I do believe this project has a lot of potential but there have been a lot of barriers to overcome to bring this project to fruition in such a short amount of time with such limited resources.*

PROJECT UPDATES

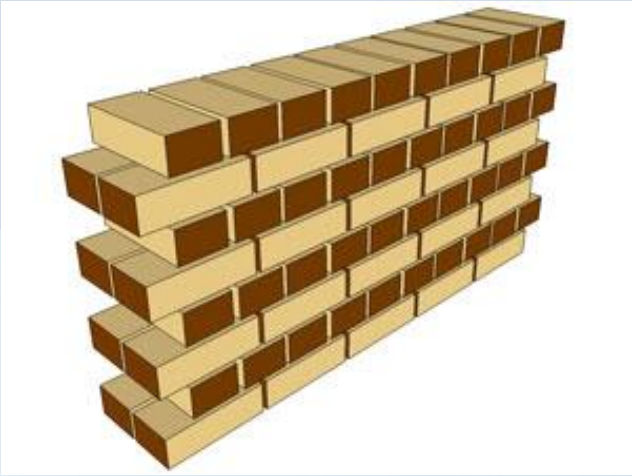
- **Pelleg/Wiid – Project Name: Catheter Associated UTI Reduction on a Teaching Service**
- *Our project continues to remain on track and is progressing appropriately. Our intervention period started on November 1 and has been ongoing since that time. Monthly education sessions have been provided to each incoming faculty medicine team upon the start of their rotation. Furthermore, several education sessions have been provided to Faculty Medicine Attendings and this was reinforced during a Grand Rounds session. The electronic Foley catheter alert process was implemented on Nov 1 and has been active with current faculty participation. Daily notifications of Foley catheter statuses have been provided to the inpatient faculty medicine teams. Data collection is ongoing with daily Foley and patient days. Furthermore, data analysis continues with regards to the current electronic alert process.*
- *We do not anticipate any significant barriers to continuation of this project. Of course, obtaining data from a similar period in previous years (namely Foley catheter days and total patient days) would be most helpful.*

PROJECT UPDATES

- **Rawlins/Pagan – Epic Optimization for the Internal Medicine Resident Rounding**
- *Our project was to create an internal medicine rounding tab within epic that might improve the rounding process for our internal medicine residents. We sought to make more easily accessible and central the information that needed to be gathered for daily rounds. The contents needed for rounds typically include vitals, labs, daily imaging, medication list, prior to admission medications and the problem list. We created a rounding tab in which all of this information is displayed on one format. Our hope is that by creating this tool, the resident's morning rounding process will be streamlined which will in turn improve the care of their patients. Our next step in the project is to unveil this to the residents for use on daily rounds. Following this we will look to have a survey ready for the teams which will gauge how much it helped their morning rounding process, improved the care of their patients, and improved upon the existing resources which were already in place.*

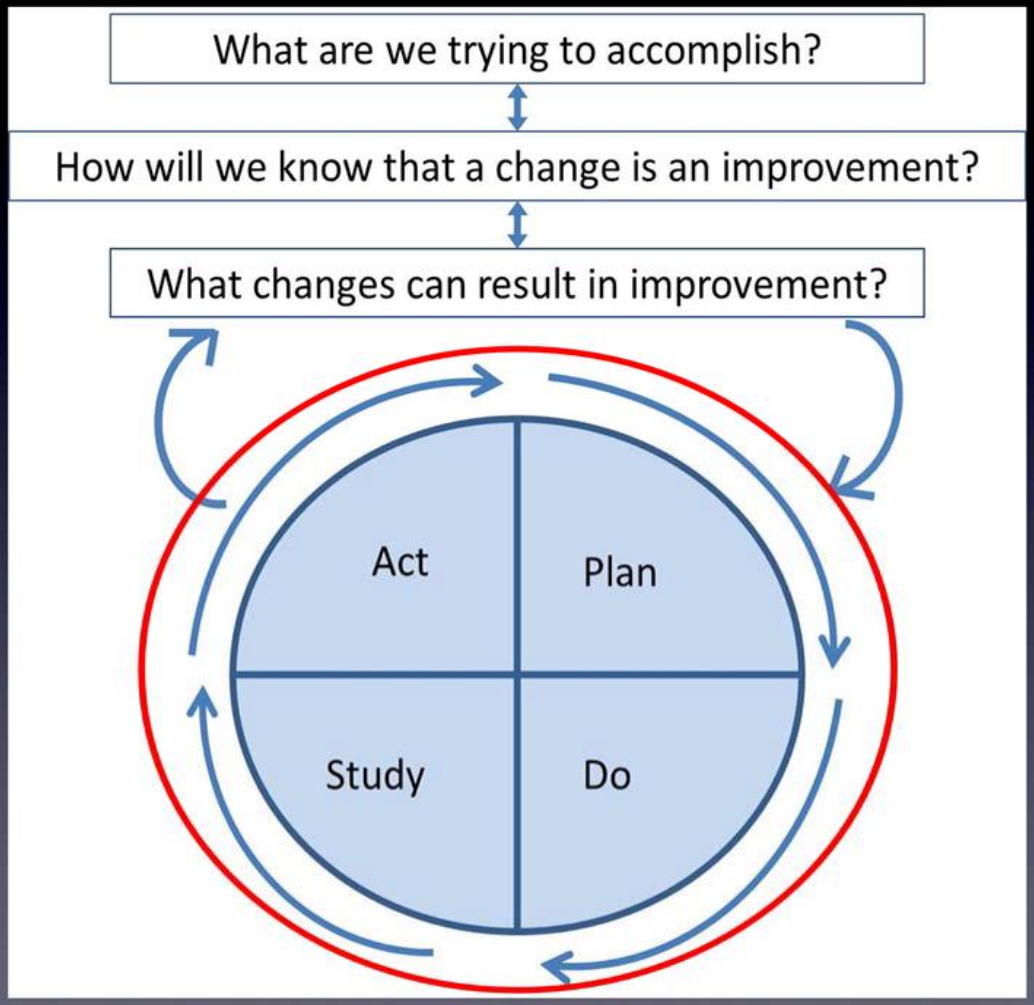
Improve

Rapid Change Cycle



Laying Bricks

Pouring Concrete


What are we trying to accomplish?
How will we know that a change is an improvement?
What changes can result in improvement?
Act
Plan
Study
Do

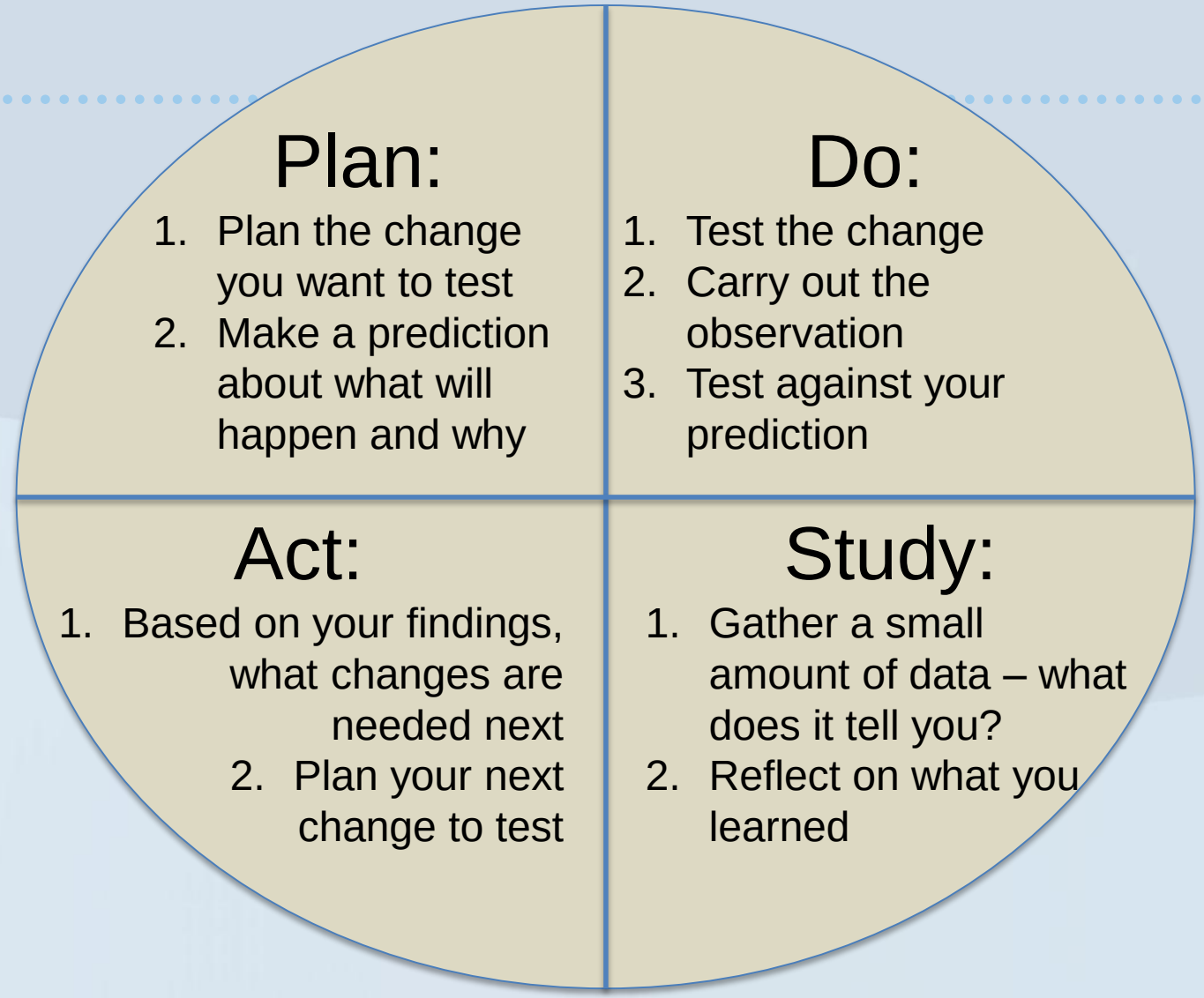
PDSA – KEY PRINCIPLES

Prediction + Reflection = Learning

Multiple change cycles are usually required, YET many do not take this approach

Benefits of PDSA

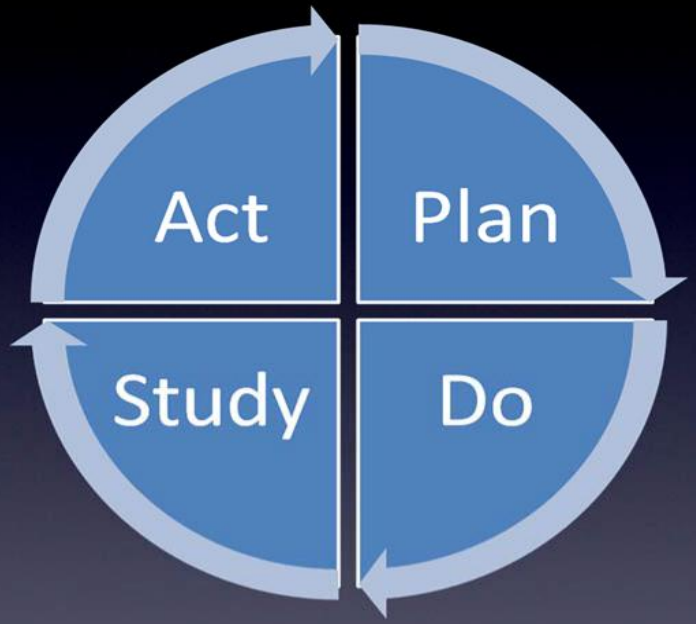
- BELIEF
- WHICH CHANGE WORKED?
- CONTEXT
- MINIMIZE RESISTANCE


Plan:
1. Plan the change you want to test
2. Make a prediction about what will happen and why
Do:
1. Test the change
2. Carry out the observation
3. Test against your prediction
Act:
1. Based on your findings, what changes are needed next
2. Plan your next change to test
Study:
1. Gather a small amount of data – what does it tell you?
2. Reflect on what you learned

Example

- Reducing inappropriate urinary catheterization in hospitalized general medicine patients

1 Learning PDSA



Is there urinary catheter overuse at this hospital?

1 Learning PDSA

Point prevalence study organized and performed on April 10th, 2014

1 Learning PDSA

54/284 (19%) of hospitalized patients catheterized

37/54 (69%) lack guideline based indication (CI: 55-79)

1 Learning PDSA

YES – the problem is obvious (>50%) and there is potential for improvement

Let's take this on!

2 Learning PDSA

Is the problem related to inappropriate insertions or inappropriate maintenance of catheters?

2 Learning PDSA

Chart review of all catheterized patients on April 10th, 2014

Inpatient unit	Insertion (%)	Maintenance (%)
Oncology	49	51
Medicine	39	61
Surgery	0	100
Surgery	100	0
Medicine	0	100
Medicine	100	0
Cardiology	50	50
Medicine	73	27
Surgery	40	60
Medicine	67	33

2 Learning PDSA

Mix of inappropriate insertion and maintenance

Most common location for inappropriate insertion is ED

Inappropriate maintenance was an important contributor on medical wards

2 Learning PDSA

We have no say in the ED…let's focus on the GIM wards!

3 Learning PDSA

What is most effective way to remove catheters on the ward?

3 Learning PDSA

Survey staff at GIM business meeting

Create catheter working group of GIM physicians

Review literature on what has been done

Chat with other centers (MSH)

3 Learning PDSA

Literature suggests Nurse advanced directives are effective (recent study in Am J Infect Contol in Dec 2013)

Survey of GIM staff indicates they are open to this concept

3 Learning PDSA

We need to get GIM staff to agree on criteria for catheter removal

4 Development PDSA

What are criteria for catheter removal and can GIM staff agree on these?

4 Development PDSA

Bring to GIM business meeting again

Review literature regarding clinical indications

See what other centers have used

Revised indications for indwelling urinary catheter (Foley) indications for Medical inpatient units

1. Pre-admission permanent indwelling catheter
2. Bladder outlet obstruction
3. CBI for gross hematuria
4. Stage 4 sacral ulcers + incontinence in females (males to use condom catheters)
5. Comfort care in end of life

✔ GIM staff approved on May 29th

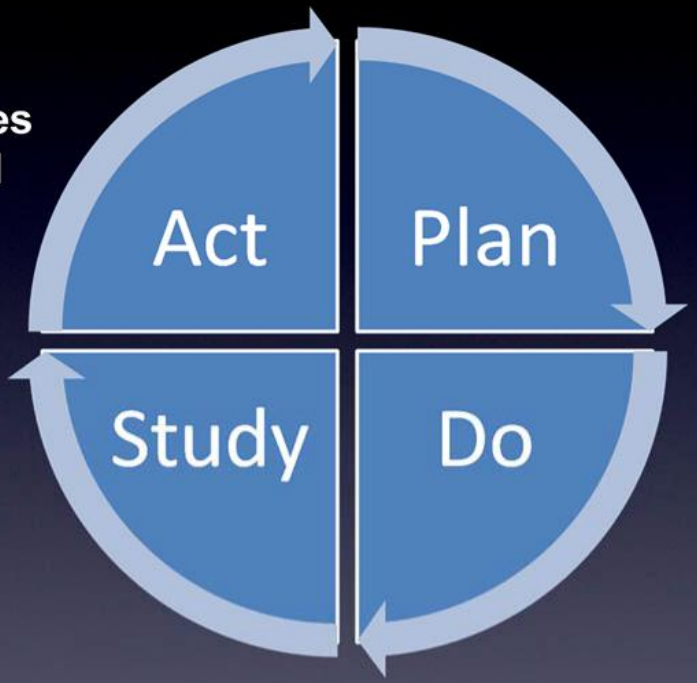
4 Development PDSA

Criteria approved by GIM staff

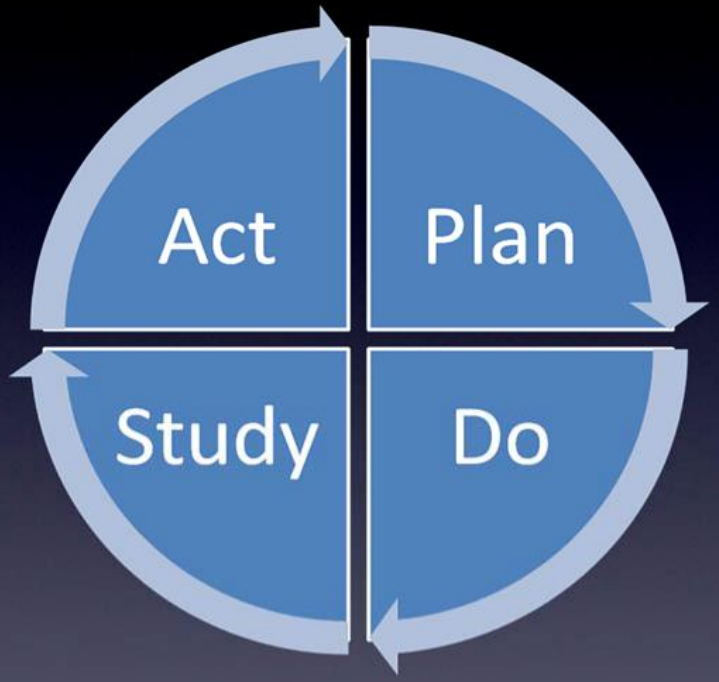
Concerns regarding Nurses ability to follow appropriately

4 Development PDSA

Determine if Nurses can recognize and follow the criteria



5 Testing PDSA



Are the advanced directive criteria easy to apply for Nurses?

5 Development PDSA

Usability testing (cases given to Nurses to assess)

Obtain feedback from Nurses and APNs to improve the direct in iterative fashion

5 Development PDSA

Multiple issues with usability identified and improved with feedback

5 Development PDSA

APNs and catheter working group agrees it is ready for pilot implementation

Interactive Exercise

- Think about the case study
- How does it relate to your project?
- Have you applied Rapid Change Cycle and PDSA to your project?

Interactive Exercise

Consider one of your potential changes you've identified for your QI project

Plan your PDSA cycle…

- What do you predict will happen?
- How will you focus your data collection to learn from your change cycle?
- How will you apply what is learned to your next change cycle?

Control

- Hardwiring made changes so reverting back to old way isn't possible
- Reinforcing mechanisms in place
  - Routine trainings
  - Audits and Reports
  - Special Emphasis for New Members

BREAK

How do you know if things have improved?

Displaying Data

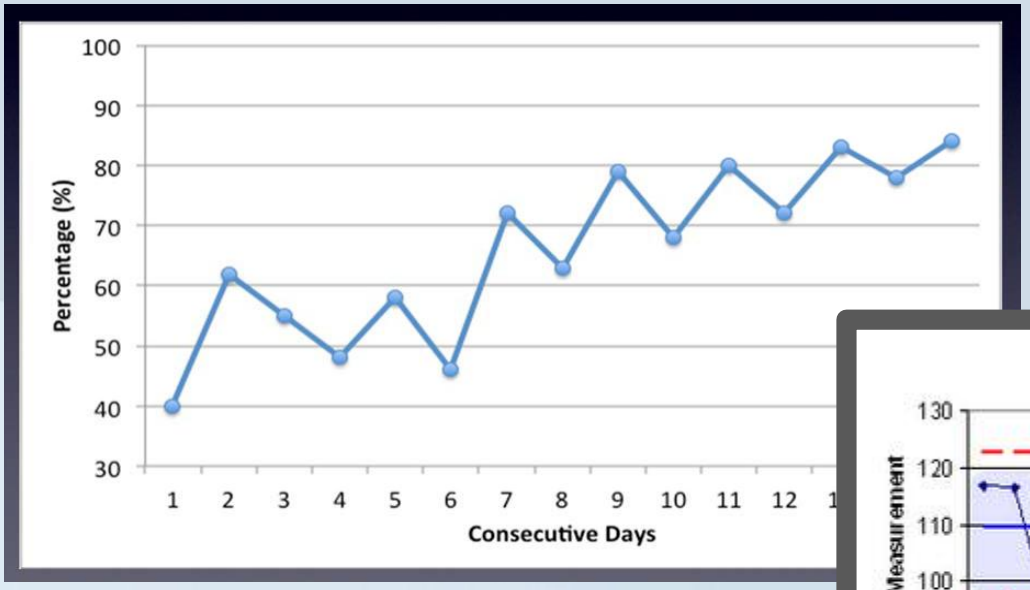
VARIATION

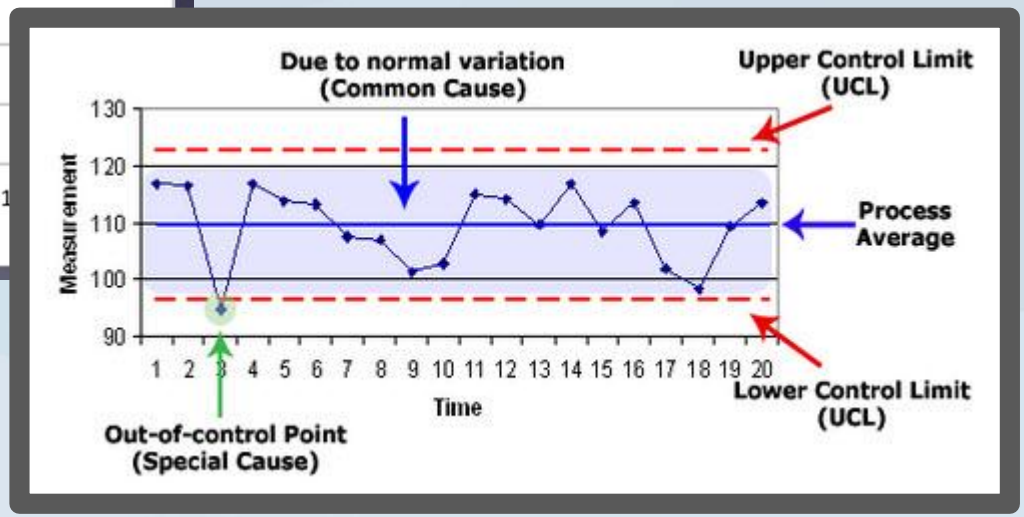
- Common cause variation = “noise”
- Special cause variation = “signal”

Run Charts

- Displays data to make process performance visible
- Determine if change resulted in improvement
- Determine if changes that have been implemented have been sustained

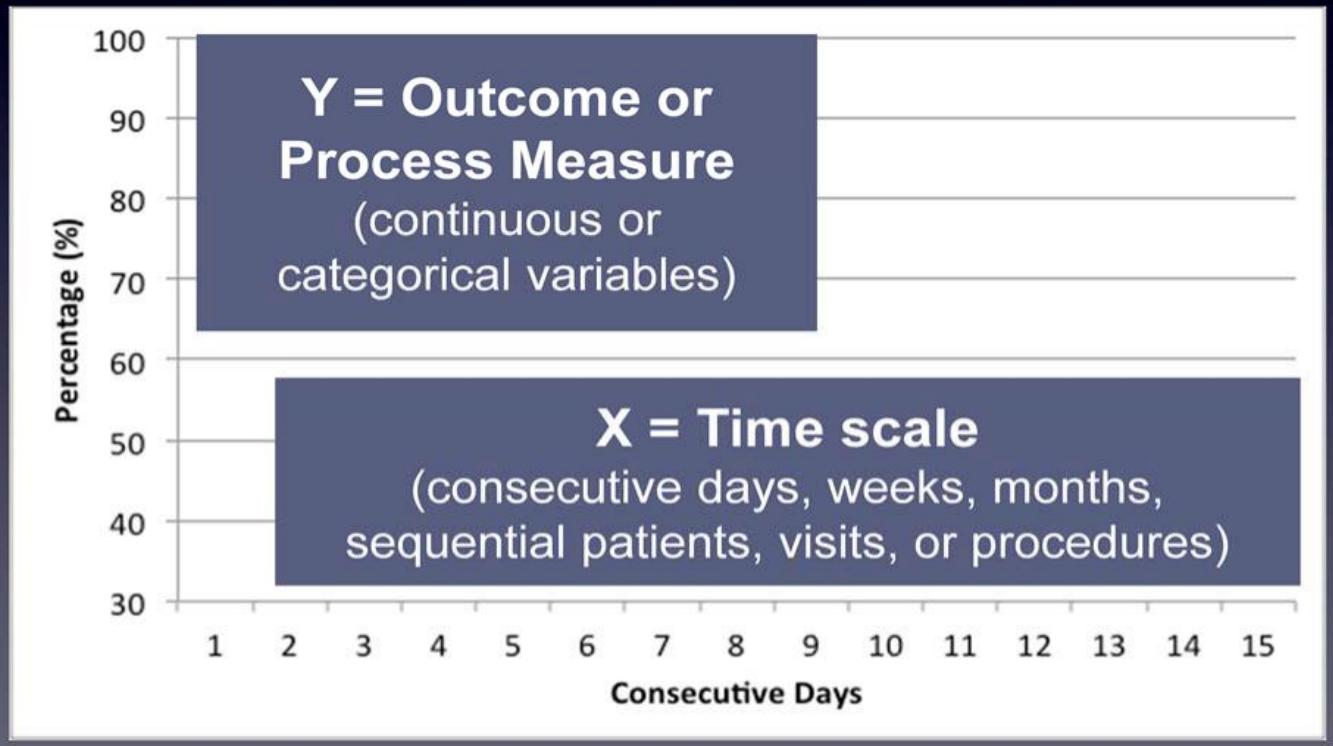
Run Charts


100
90
80
70
60
50
40
30
Percentage (%)
1 2 3 4 5 6 7 8 9 10 11 12
Consecutive Days


Due to normal variation
(Common Cause)
Upper Control Limit
(UCL)
Process
Average
Lower Control Limit
(UCL)
Out-of-control Point
(Special Cause)
Measurement
130
120
110
100
90
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Time

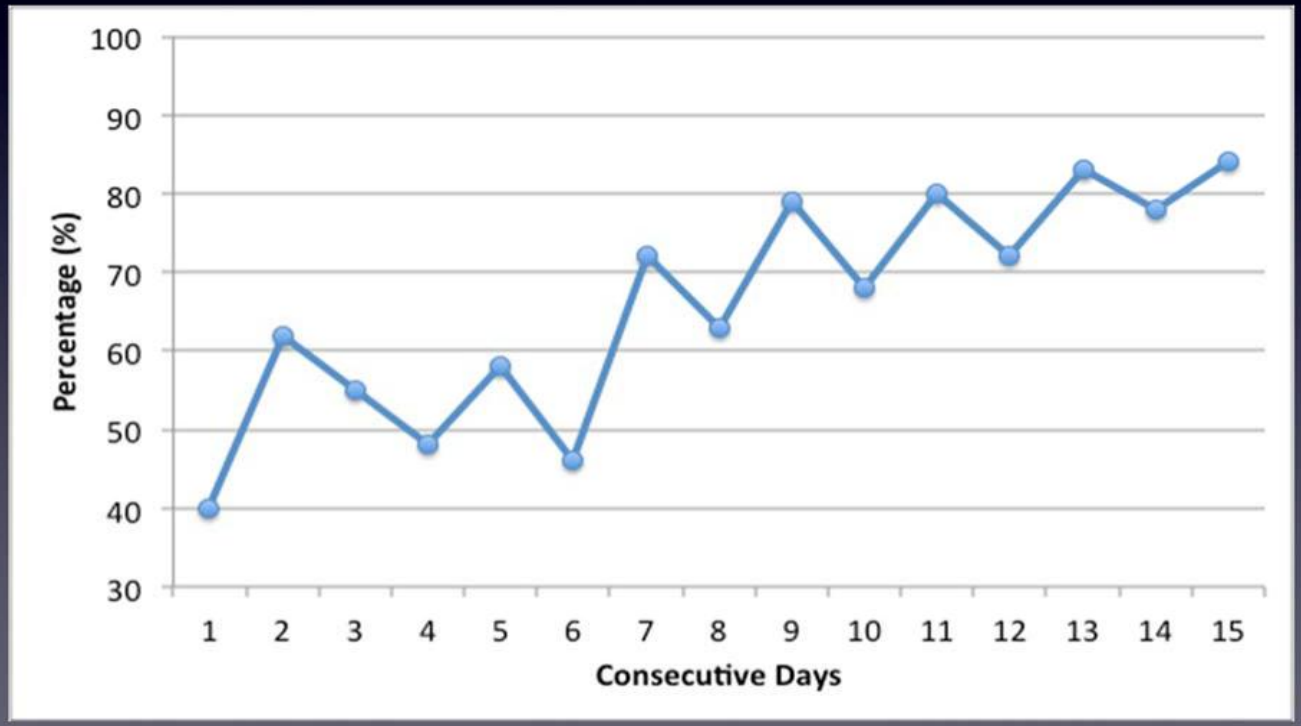
Constructing a run chart

- Step 1: Label the x- and y-axis



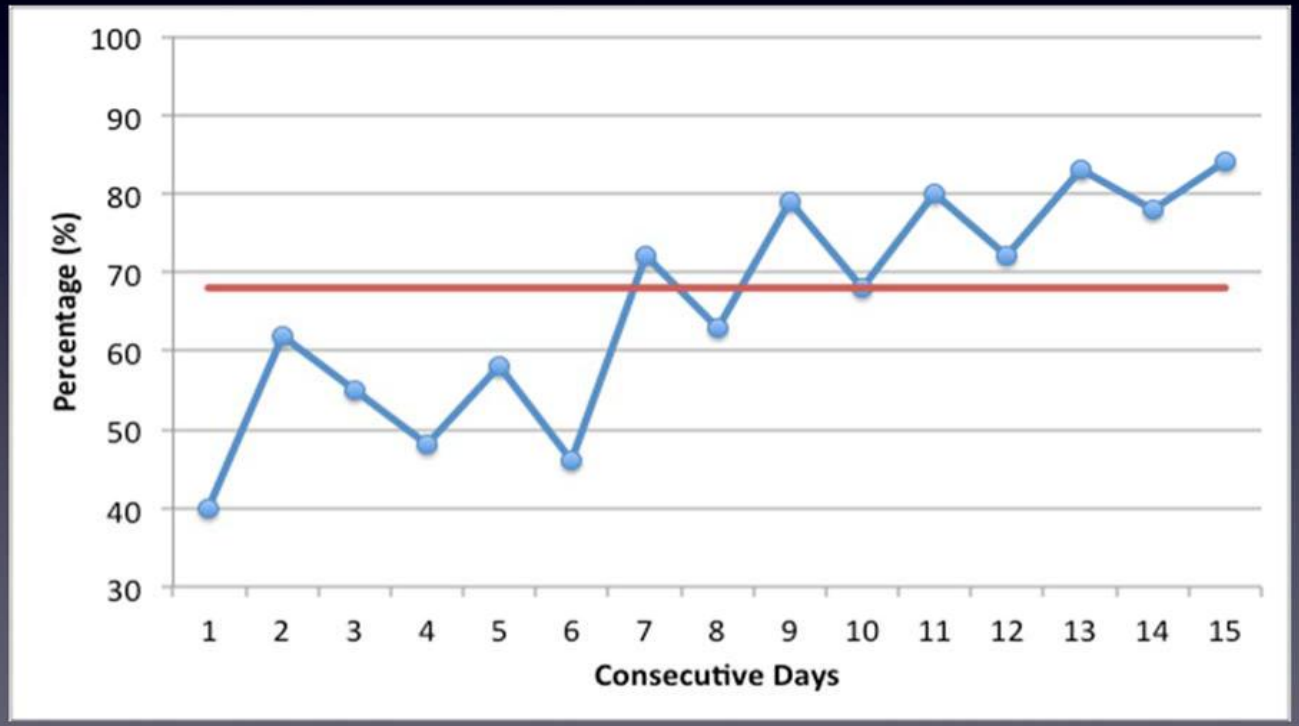
Constructing a run chart

- Step 2: Plot the data



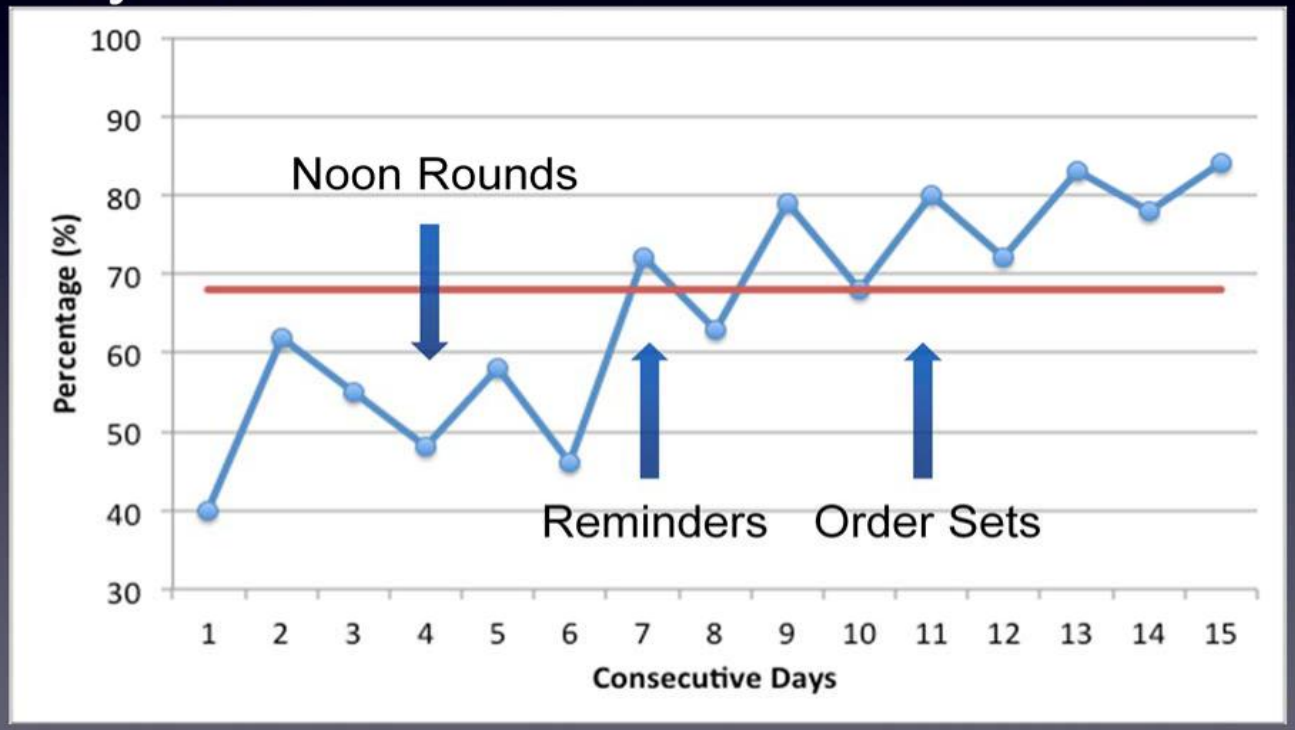
Constructing a run chart

- Step 3: Calculate and plot a median line



Constructing a run chart

- Step 4: Annotate chart with change cycles



Run Chart Rules

Think of it as flipping a coin…

- What is the probability that you will flip a coin and land on heads 6 times in a row?

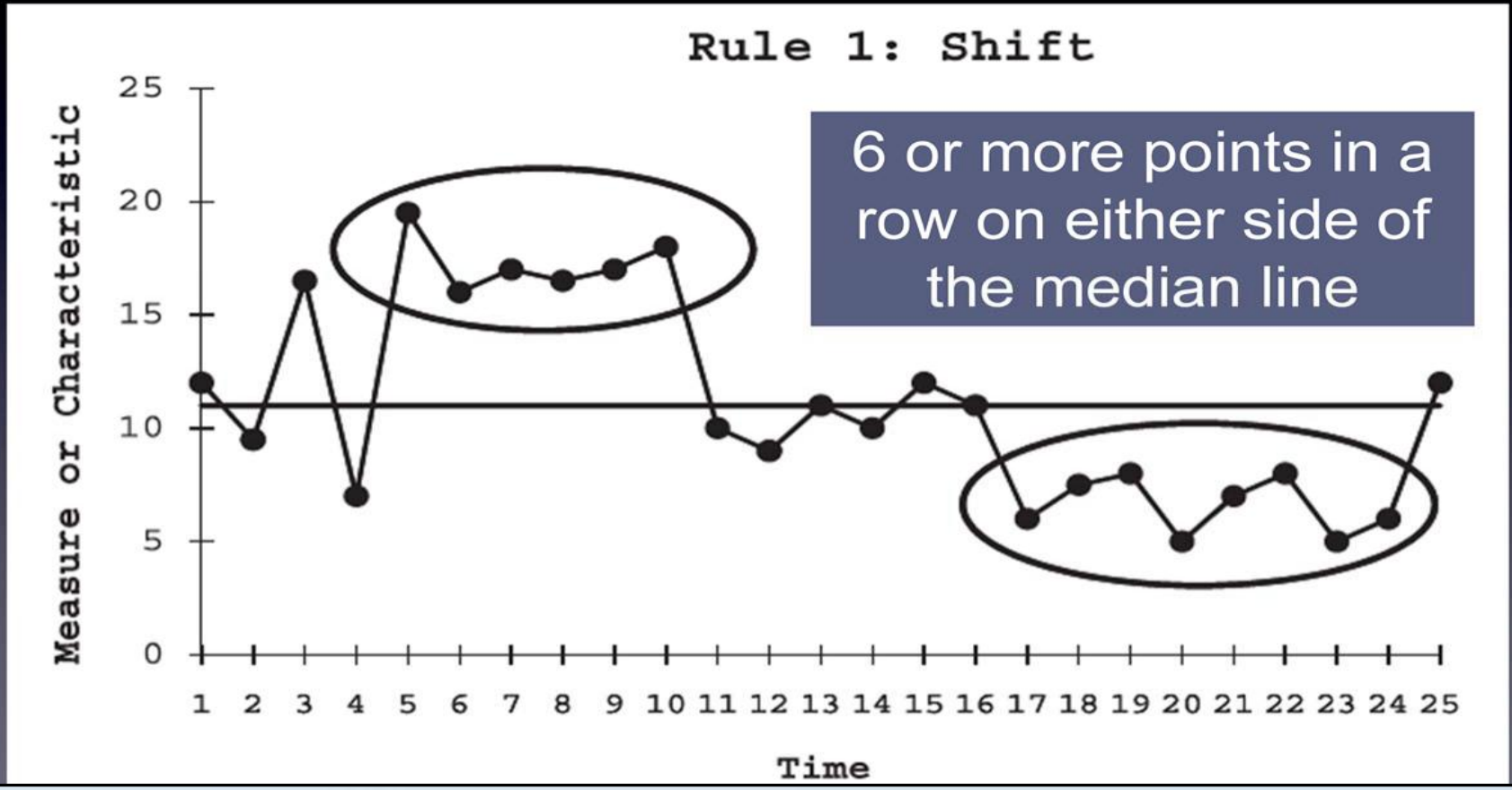
- 0.5 x 0.5 x 0.5 x 0.5 x 0.5 x 0.5 = 0.02

Run chart rules for detecting special cause variation

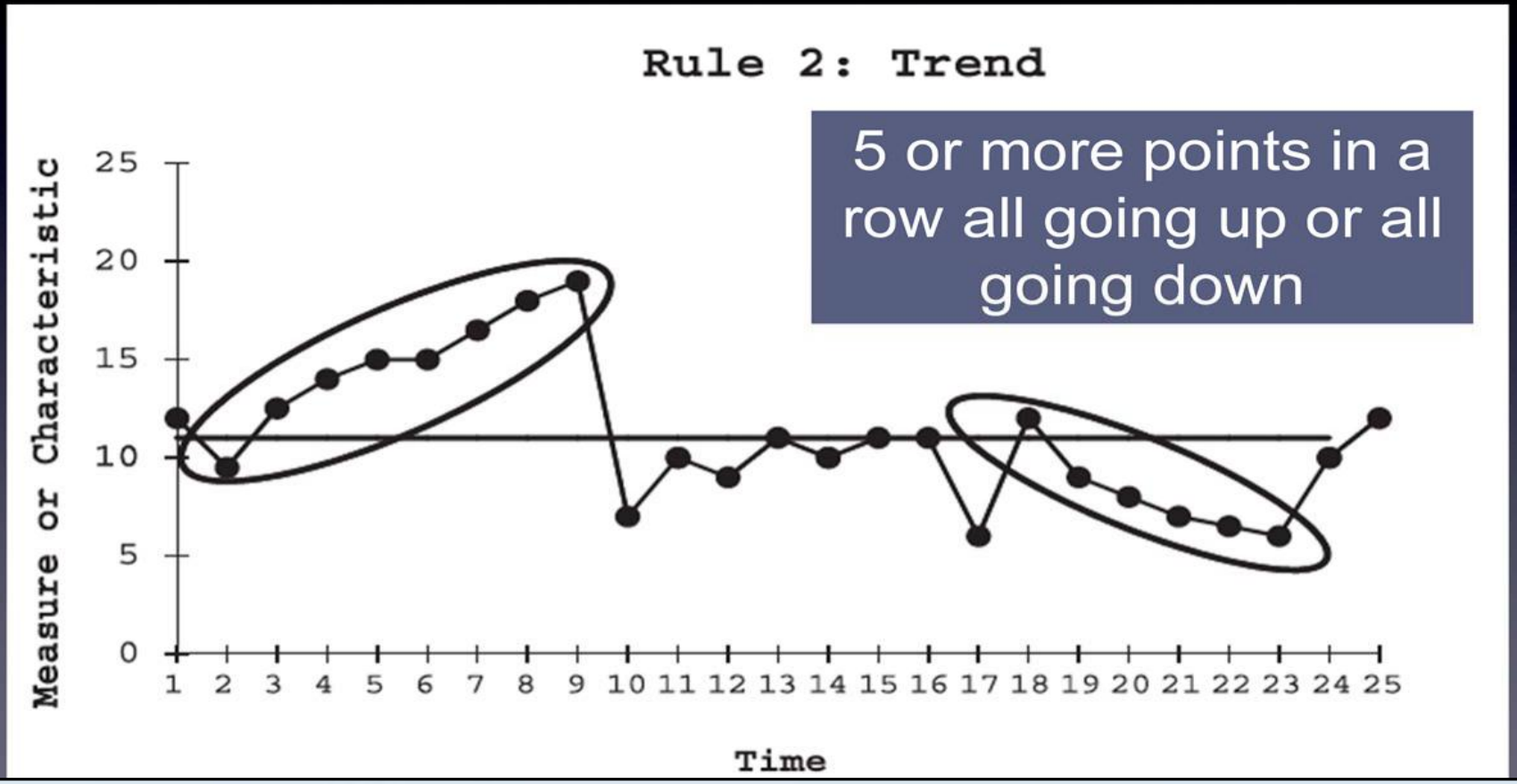
- Shift
- Trend
- Runs
- Astronomical point

BMJ Qual Saf 2011;20:46-51

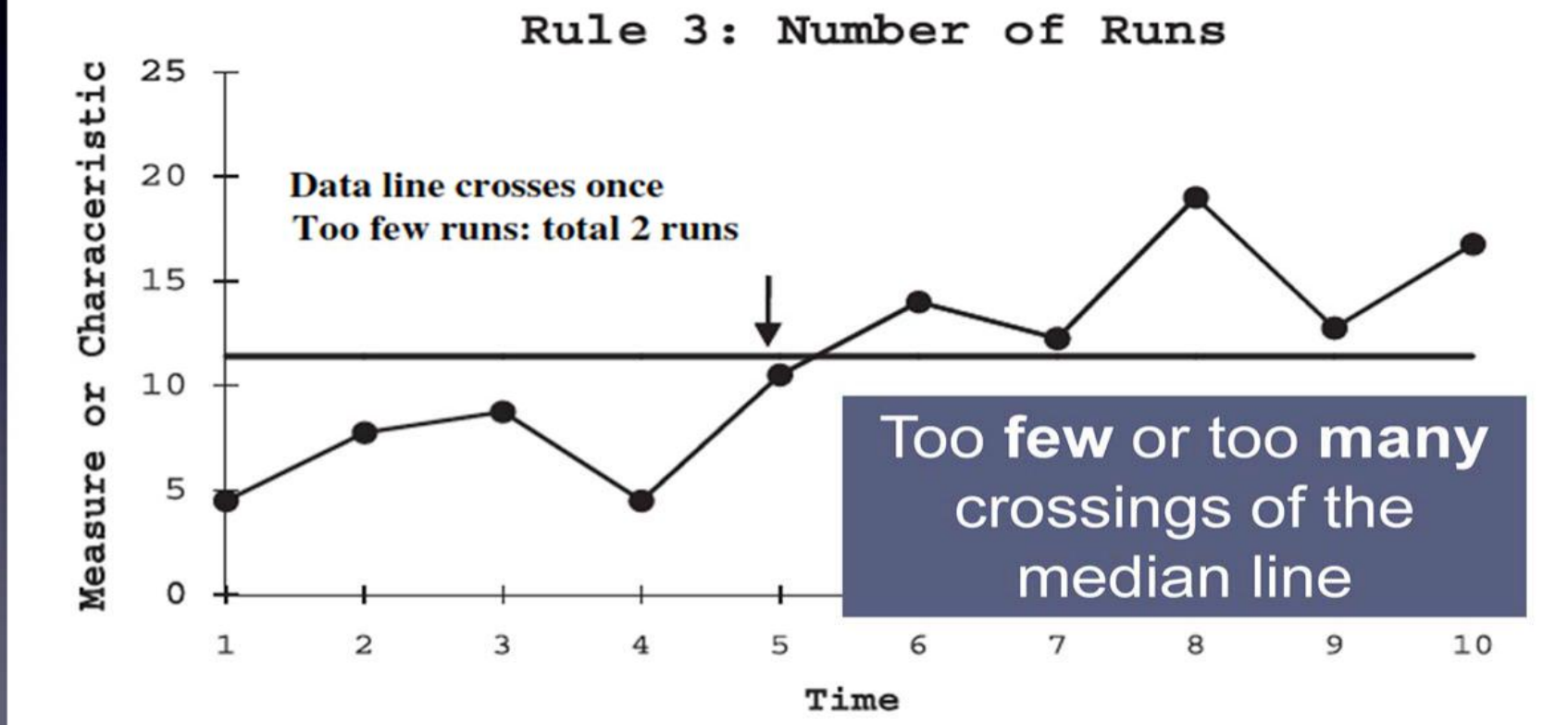
Rule #1: Shift


Rule 1: Shift
6 or more points in a row on either side of the median line
Measure or Characteristic
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Time

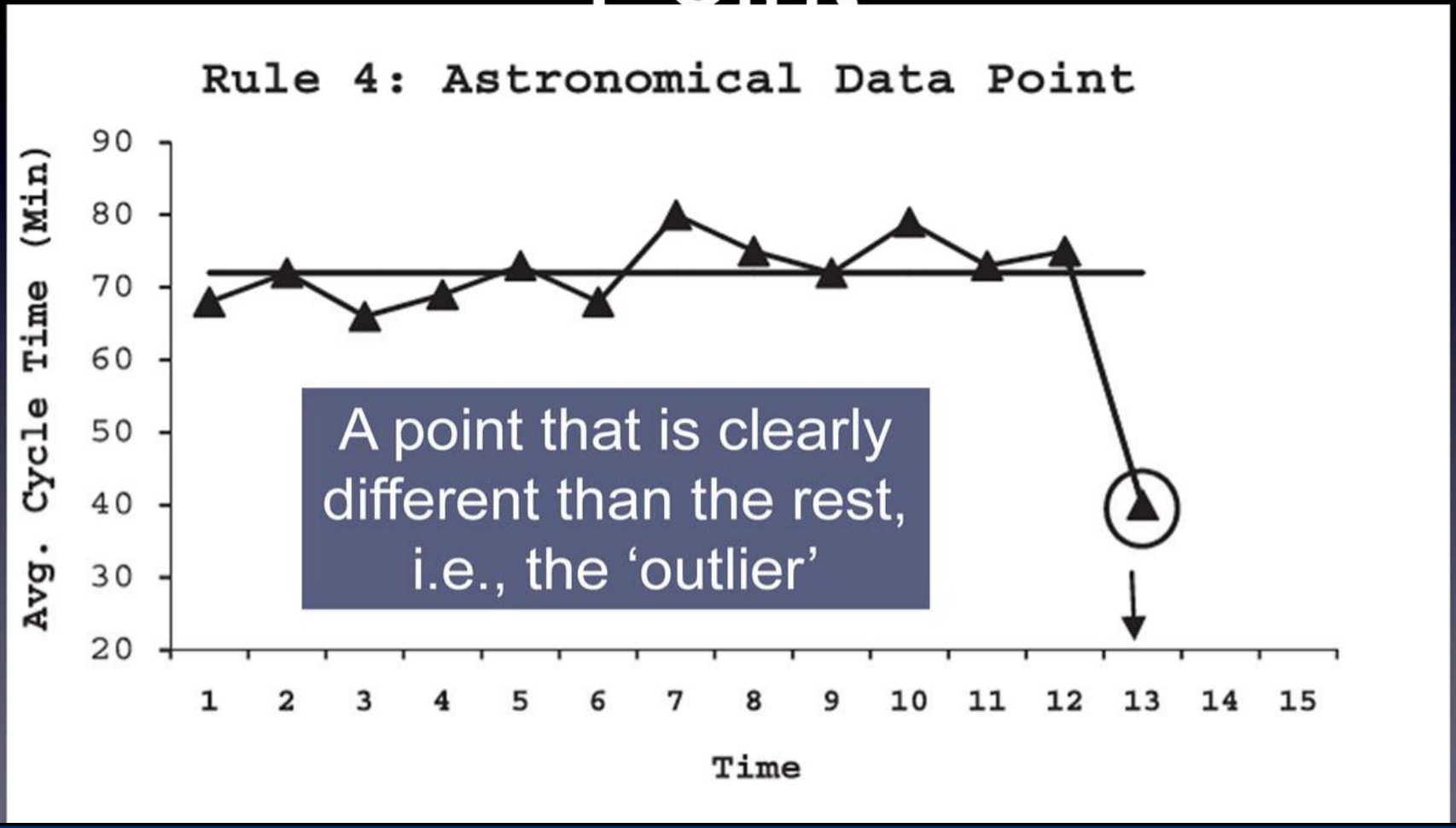
Rule #2: Trend


Rule 2: Trend
5 or more points in a row all going up or all going down
Measure or Characteristic
0
5
10
15
20
25
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Time

Rule #3: Number of Runs



Rule #4: Astronomical Point



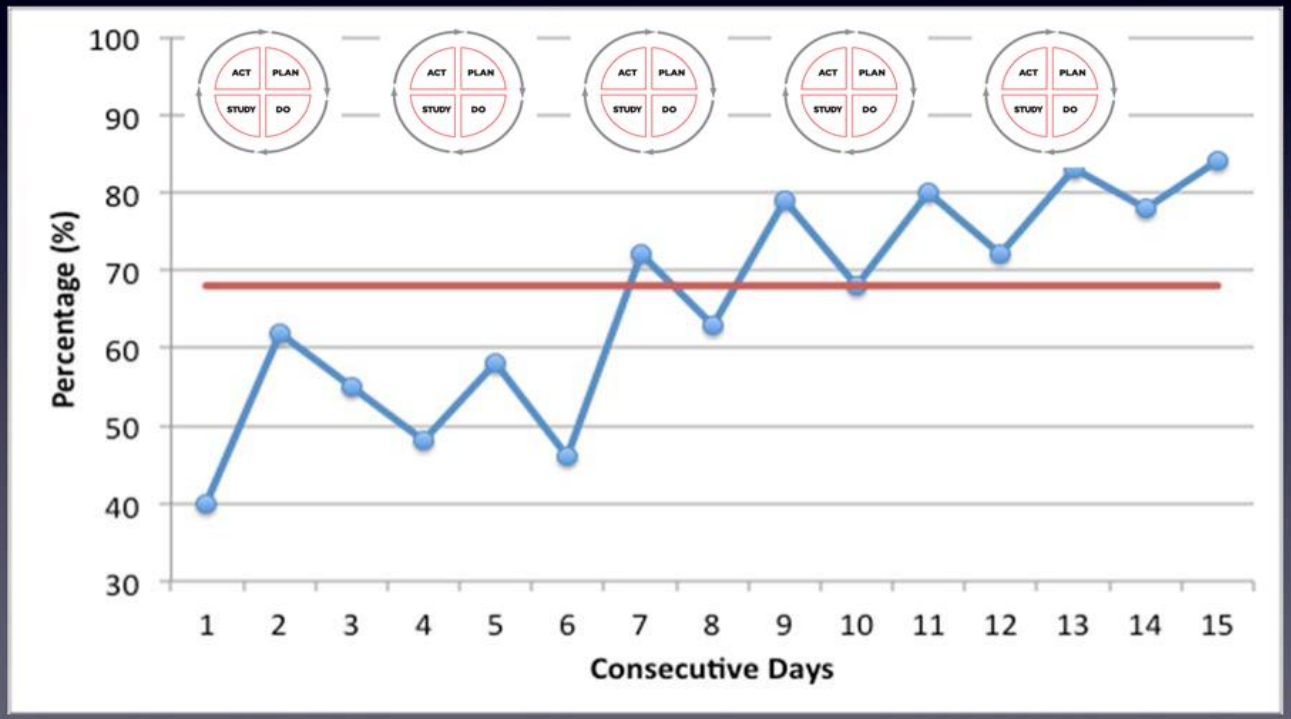
What is the cause of special cause variation?

Interactive Exercise

Using the data set provided, construct and interpret the run chart.

- Can you detect any special cause variation?

Monitoring improvement over time



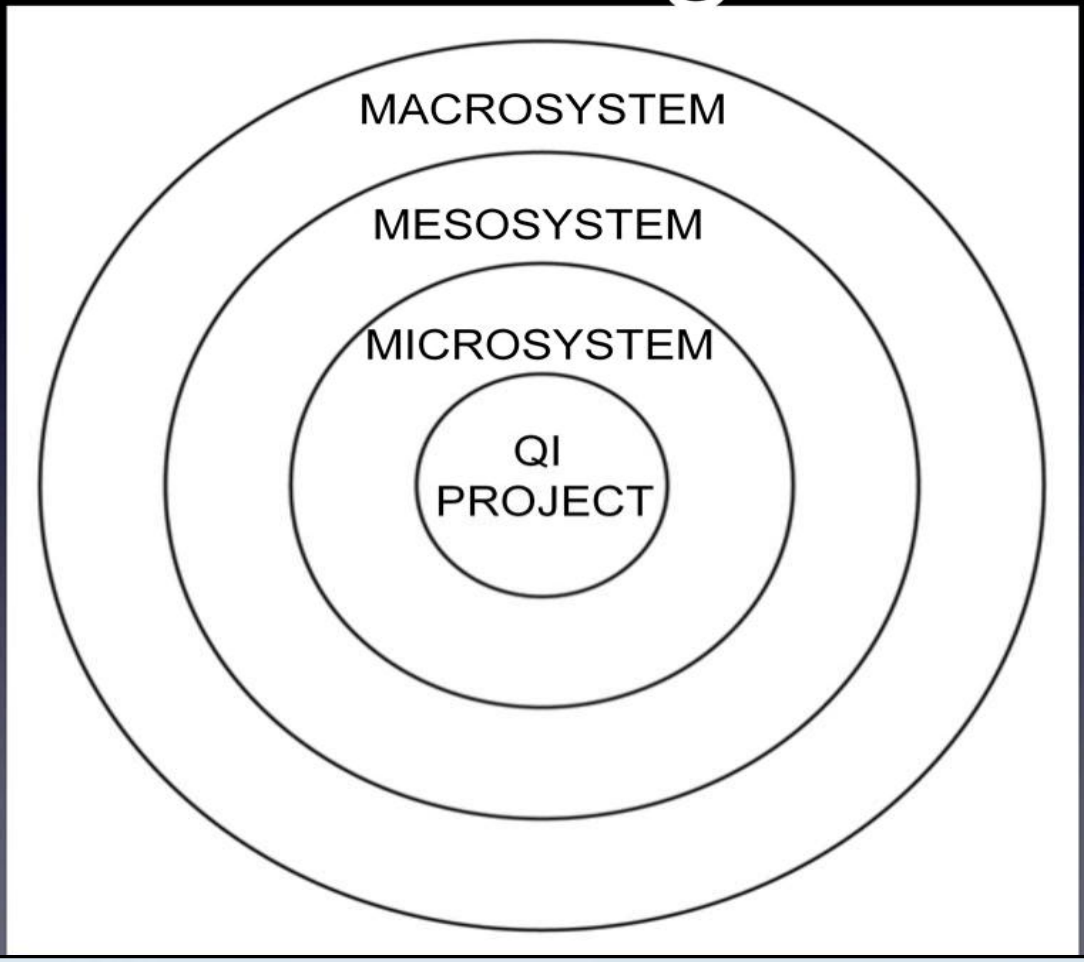
Understanding Context

Why do some QI projects succeed while other don’t?

CONTEXT

- All factors that are NOT part of the QI intervention
- The setting in which you are implementing your QI project
- Combination of factors that may favor or work against success of your project
- Characteristics of your organization, environment, individuals, etc.

Understanding Context



Microsystem

The clinical environment where you are rolling out your intervention, e.g. one inpatient unit, or outpatient clinic

The local factors at the microsystem level often have the most influence on your project

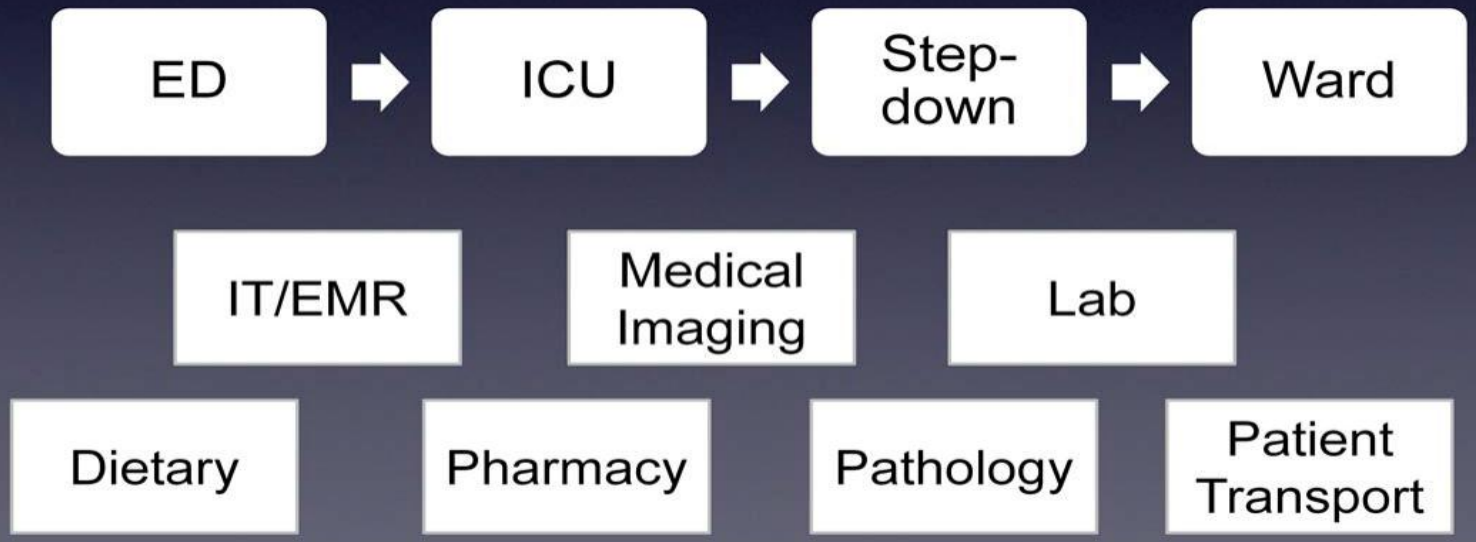
Microsystem

QI Team Factors

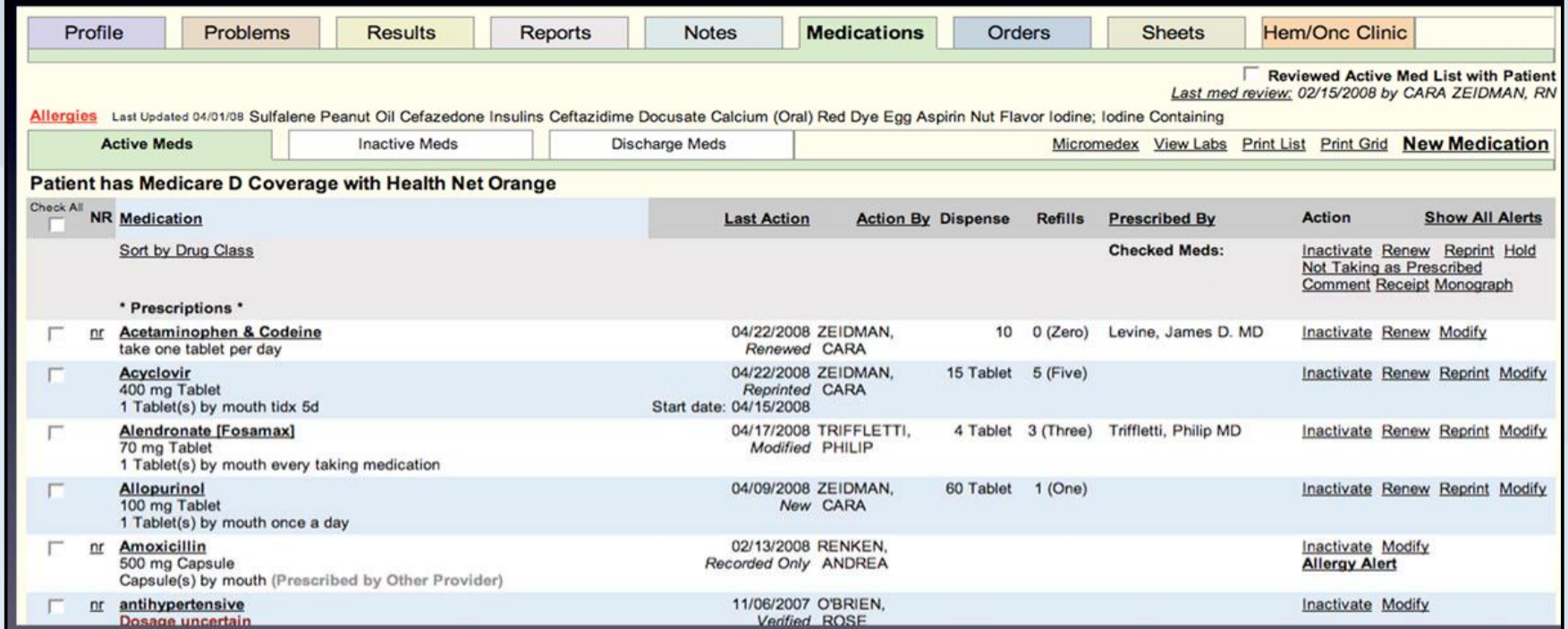
- QI training and culture
- Prior QI experience
- Interprofessional involvement
- MD involvement
- Subject matter experts
- Strong team leadership
- Team dynamics

Mesosystem

- The collection of microsystems that a patient travels through during their clinical care



IT Support - EMR



Profile | Problems | Results | Reports | Notes | **Medications** | Orders | Sheets | Hem/Onc Clinic

☐ **Reviewed Active Med List with Patient**

Last med review: 02/15/2008 by CARA ZEIDMAN, RN

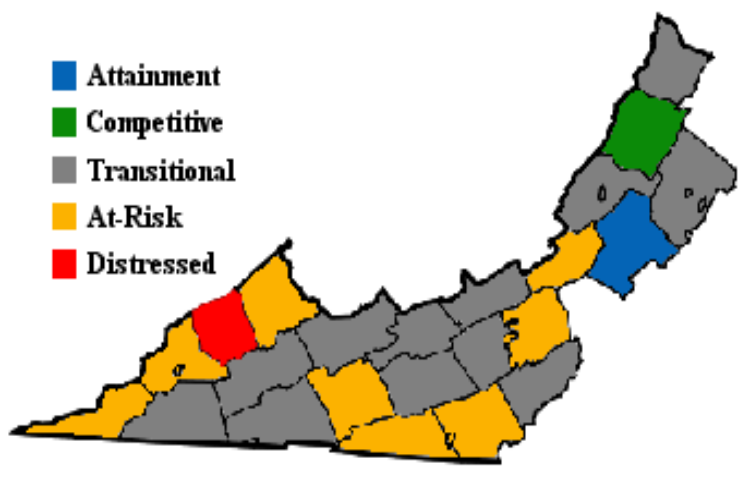
Allergies Last Updated 04/01/08 Sulfalene Peanut Oil Cefazedone Insulins Ceftazidime Docusate Calcium (Oral) Red Dye Egg Aspirin Nut Flavor Iodine; Iodine Containing

Active Meds | Inactive Meds | Discharge Meds | Micromedex | View Labs | Print List | Print Grid | **New Medication**

Patient has Medicare D Coverage with Health Net Orange

Check All	NR	Medication	Last Action	Action By	Dispense	Refills	Prescribed By	Action	Show All Alerts
		Sort by Drug Class					**Checked Meds:**	Inactivate Renew Reprint Hold Not Taking as Prescribed Comment Receipt Monograph	
		*** Prescriptions ***							
☐	nr	**Acetaminophen & Codeine** take one tablet per day	04/22/2008 *Renewed*	ZEIDMAN, CARA	10	0 (Zero)	Levine, James D. MD	Inactivate Renew Modify	
☐		**Acyclovir** 400 mg Tablet 1 Tablet(s) by mouth tidx 5d	04/22/2008 *Reprinted* Start date: 04/15/2008	ZEIDMAN, CARA	15 Tablet	5 (Five)		Inactivate Renew Reprint Modify	
☐		**Alendronate [Fosamax]** 70 mg Tablet 1 Tablet(s) by mouth every taking medication	04/17/2008 *Modified*	TRIFFLETTI, PHILIP	4 Tablet	3 (Three)	Triffletti, Philip MD	Inactivate Renew Reprint Modify	
☐		**Allopurinol** 100 mg Tablet 1 Tablet(s) by mouth once a day	04/09/2008 *New*	ZEIDMAN, CARA	60 Tablet	1 (One)		Inactivate Renew Reprint Modify	
☐	nr	**Amoxicillin** 500 mg Capsule Capsule(s) by mouth (Prescribed by Other Provider)	02/13/2008 *Recorded Only*	RENKEN, ANDREA				Inactivate Modify **Allergy Alert**	
☐	nr	**antihypertensive** Dosage uncertain	11/06/2007 *Verified*	O'BRIEN, ROSE				Inactivate Modify	

Macrosystems



Macrosystem Factors

- External Project Sponsorship
- QI Leadership
  CEO, Board, Physicians
- QI and Patient Safety Culture

LESSONS LEARNED

- Identify one relevant contextual factor at each of the macro-,meso-,and microsystem levels
- Are these factors likely to help or hinder your project?
- Develop a strategy to make use of or mitigate these factors to help achieve QI success

Learning Objectives Review

By the end of this workshop, participants will be able to:

- *Apply rapid cycle change methods to a QI project*
- *Construct and interpret a run chart*
- *Identify and leverage contextual factors for QI success*

February – May 2016

- Carry out several improvement cycles to test changes, using prediction and reflection to inform subsequent cycles
- Continue data collection to see if your changes are leading to improvements in your outcomes

NEXT STEPS

- All projects are due for presentation on Friday, May 27 from 1:00 – 4:00 pm
- Poster and Abstract turned in at time of presentation
- Abstract to be 300 – 500 word summary of your project
- We will have three awards of:
  - Impact Award
  - Innovation Award
  - Education Award

AWARD JUDGES

- Dr. Ralph Whatley, Chief Quality Officer
- Michael Parish, VP of Quality and Patient Safety
- Cynthia Smith, Director of Quality and Patient Safety
- Kathleen Baudreau, VP Clinical Risk Management and Patient Engagement
- Dr. Jon Sweet, Interim Chair, Dept of Medicine
- Dr. Jeri Lantz, Section Chief, Internal Medicine