Basics of Quality Improvement

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Session Time: 3:00 – 3:45

Objectives

- Discuss and understand Quality Improvement Theory

- Recognize the steps in writing an Aim Statement and Quality Measures

- Discuss QI tools such as process diagrams and key driver diagrams

- Bonus: Review the basics of run and control charts (If time permits)

Aims for Improvement

- Institute of Medicine, Crossing the Quality Chasm: Health Care in the 21st century
- Define 6 key dimensions for improvement
  - Safe
  - Timely
  - Effective
  - Efficient
  - Equitable
  - Patient-Centered

Aims for Improvement

- Safe: Avoid injury from the care intended to help
- Timely: Reduce waiting for both patients and those who give care
- Effective: Match care to science; avoid overuse of ineffective care or underuse of effective care
- Efficient: Reduce waste
- Equitable: Close racial and ethnic gaps in health status
- Patient-Centered: Honor the individual and respect choice

Quality Improvement?

Addressing care gaps using practical and robust methodology that can lead to results that are measurable and sustainable.

Quality is a way to ensure we are providing Great Care

- National Committee for Quality Assurance

Atul Gawande on NCQA

Examples of QI Themes

- Decrease Clinic Wait Times
- Improve Diabetes Care
- Establish a Stroke Center Designation
- Be a Level 1 Trauma Center
- Decrease Overuse
- Increase utilization of Evidence Based Medicine
- Diagnosis and treatment of Lower Back Pain

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Selecting a Condition or Area of Care

Consider the following:

- Does it result in high levels of morbidity/mortality?

- Is it high cost?

- Does it result in high rates of health care utilization?

- What is the potential for quality improvement?
  - Usually focus on conditions/areas of care where we suspect performance may not be optimal

- Who would be accountable for improvement?
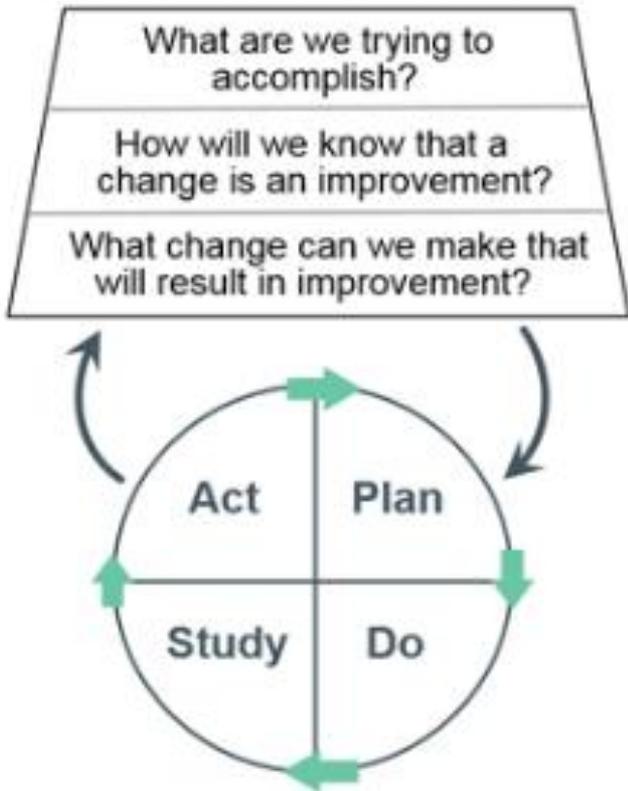 - Do they have control over the mechanisms for improving care?

Review of the Scientific Literature and Expert Consensus Guidelines

- Medline
- CINAHL
- Cochrane Library
- EMBASE
- Web of Science
- BMJ Clinical Practice

- Secondary Searches using Reference Lists
- AHRQ National Guidelines
- Guidelines from National Professional Organizations or other Institutions

Model for Improvement

Model for Improvement

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?

Act   Plan

Study   Do

Part 1:
- Three fundamental questions
- Can be asked in any order

Part 2:
- The Plan-Do-Study-Act (PDSA) cycle to test change in real work settings.
- The PDSA cycle guides the test of a change to determine if the change is an improvement.

Source: IHI, Model developed by Associates in Process Improvement

Model for Improvement

- Emphasizes the difference between making a change and making an improvement.

- Compare change resets a process to "normal"

- Improvement making a change with measurable effect

Applying the Model for Improvement

- Set an aim

- Establish measures

- Identify changes

- Test change

- Implement changes

Setting Aims: What are we trying to accomplish?

- Improvement requires setting aims.

- We can't improve without a clear and firm intention to do so.

- Important to people involved

- Smaller, short-term aims can contribute to bigger ones

Global Goal to AIM

- Start with a theory
  - Ex: Increasing rates of hand hygiene will lead to less disease transmission to patients and thus reduce rates of hospital-acquired infections.

- Decide what your target for your narrower aim.
 - Ex: Increasing rates of hand hygiene

- Get SMART about it.

SMART Aim

- Specific – population of patients affected
- Measurable – give specifics 50% ➔ 70%
- Achievable – People and resources available
- Realistic – Stretch but not impossible
- Timely – Time specific "by June 1st or within 6 mons"

Ex: Increase rates of hand hygiene compliance in SICU from 65% to 85% by Jan 1st.

QI Aim Ideas

- Reduces adverse drug events in critical care by 75% within 1 year.

- Improve medication reconciliation at transition points by 75% within 1 year.

- Increase the number of surgical cases between cases with surgical site infection by 50% within 1 year.

- Reduce waiting time to see urologist by 50% within 9 months.
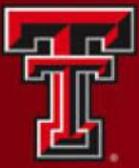
Forming the Team

- Include the right people on a process improvement team is critical to a successful improvement effort.

- Teams vary in size and composition.

Forming the Team

- First, review the aim.

- Second, what system will be affected by the improvement efforts?

- Third, include members familiar with all the different parts of the process

  – Managers, administrators

  – Physicians, pharmacists, nurses, front line workers

  – Executive sponsor who takes responsibility for the success of the project

Individual and Group Time (5 mins)

- Global Goal

- Aim

- Team Members

Science of Improvement: Establishing Measures

- How will we know that a change is an improvement?

- Measurement is a critical part of implementing changes

- Measures tell a team whether the changes they are making actually lead to improvement.

- There's a difference with measure for improvement compared to research

Types of Measures

- Different from measuring for research
  - Goal to gather enough data to inform whether to adapt, adopt, or discard an idea.
- Outcome Measures
- Process Measures
- Balancing Measure

Outcome Measures

- Where are we ultimately trying to go?
- How does the system impact the patients, their health and wellbeing?
- How does it impact stakeholders such as payers, employees, or the community?
- Diabetes: Average hemoglobin A1c
- Access: # of days to 3rd next available appointment
- ICU percent unadjusted mortality
- Adverse drug events per 1,000 doses

Process Measures

- Are we doing the right things to get there?
- Are the parts/steps in the system performing as planned?
- Diabetes: % of patients whose hemoglobin A1c level was measured twice in the past year
- Access: Average daily clinician hours available for appointments

Balancing Measures

- Are changes designed to improve one part of the system causing new problems in other parts of the system?

- For reducing time patients spend on ventilator after surgery: Make sure reintubation rates are not increasing

- For reducing patient length of stay in the hospital: Make sure readmission rates are not increasing

Guidelines vs. Quality Measures?

Clinical Guidelines	Quality Measures
Comprehensive: Cover virtually all aspects of care for a condition	**Targeted:** Apply to specific clinical circumstances where there is evidence or strong expert consensus regarding a process-outcome link
Prescriptive: Intended to influence provider behavior prospectively at the individual patient level	**Observational:** Measure provider behavior at an aggregate level; applied retrospectively
Flexible: Intentionally leave room for clinical judgment and interpretation	**Precise:** Precise language that can be applied systematically to ensure comparability across different sites of care

Six Key Steps to Developing Quality Measures

1. Select a condition or area for measure development
2. Conduct a review of the scientific literature and expert consensus guidelines
3. Consider potentially relevant data sources
4. Draft quality measure statement(s)
5. Consider factors related to the measure denominator
6. Consider factors related to the measure numerator

Consider Potentially Relevant Data Sources

- Administrative Records

- Patient Survey

- Medical Records

Exercise: What's wrong with this measure?

- <u>Data Source</u>: Medical Records Data

- All children presenting to the ED with an acute exacerbation of asthma should have had their SaO_2 measured as part of their initial assessment

Improved

- Children evaluated in the ED with an acute exacerbation of asthma *during the past 12 months* should have had their SaO_2 measured as part of their initial assessment *within 30 minutes of arrival to the ED*

Exercise: What's wrong with this measure?

- <u>Data Source</u>: Medical Records Data
- Children with asthma should have received SABA in the first hour of treatment, and then one per hour thereafter

Improved

- *Children/adolescents seen in the ED with an acute exacerbation of asthma during the past 12 months* should have received *a maximum of three inhaled* SABA treatments in the first hour of the ED stay and then one per hour thereafter

Exercise: What's wrong with this measure?

- <u>Data Source</u>: Medical Records Data
- All patients diagnosed with community acquired pneumonia during the past 12 months should have had the severity of their illness assessed based on overall clinical appearance and behavior
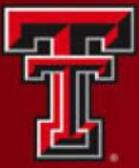
Improved

- All patients diagnosed with community acquired pneumonia *in the hospital setting* during the past 12 months, should have had the severity of their illness assessed *at the time of admission based on the presence or absence of the following signs/symptoms:*
  - *Elevated respiratory rate*
  - *Retractions*
  - *Lethargy*
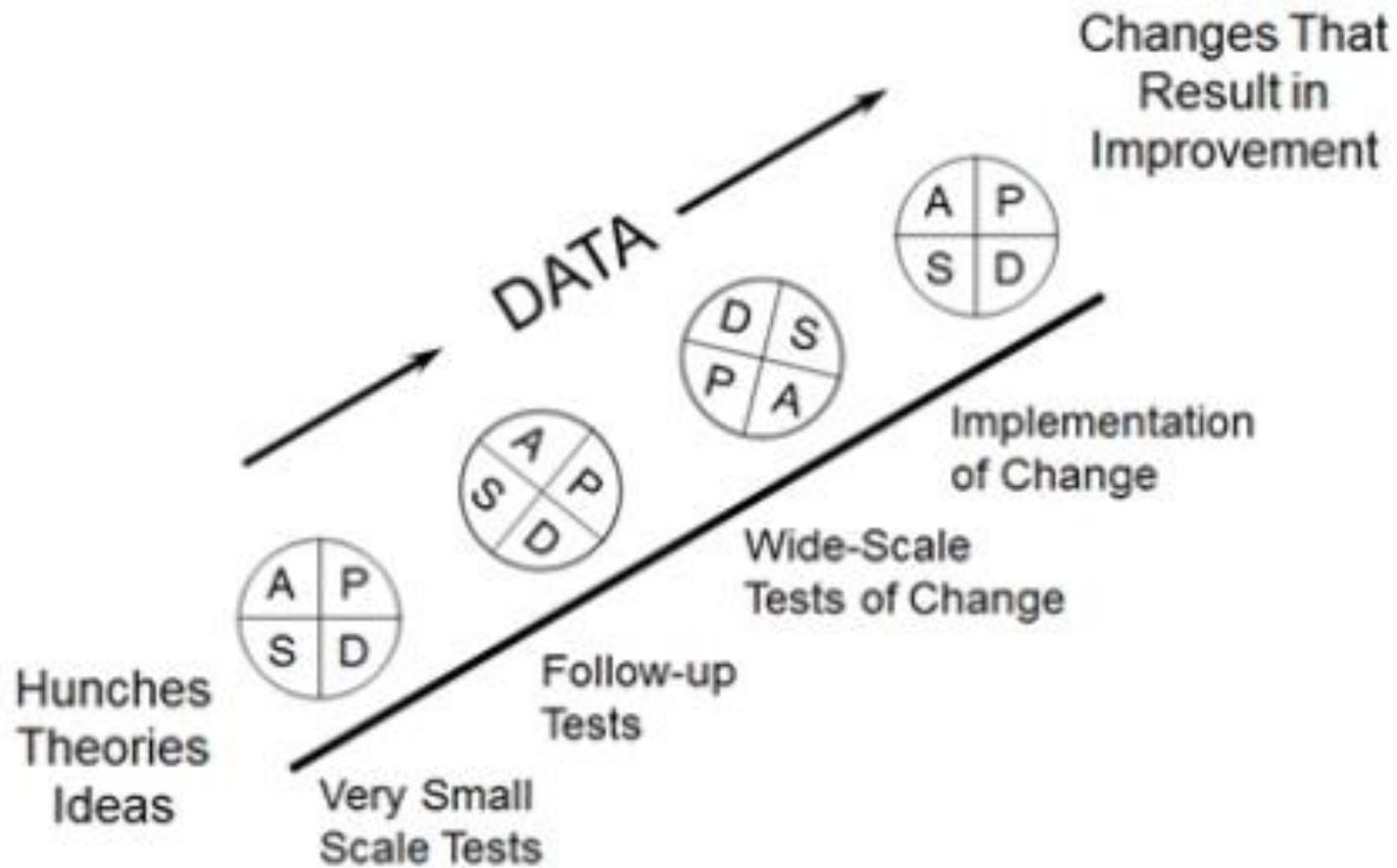 - *Oxygen saturation <90%*

Individual/Group Time

- Measure
- Denominator
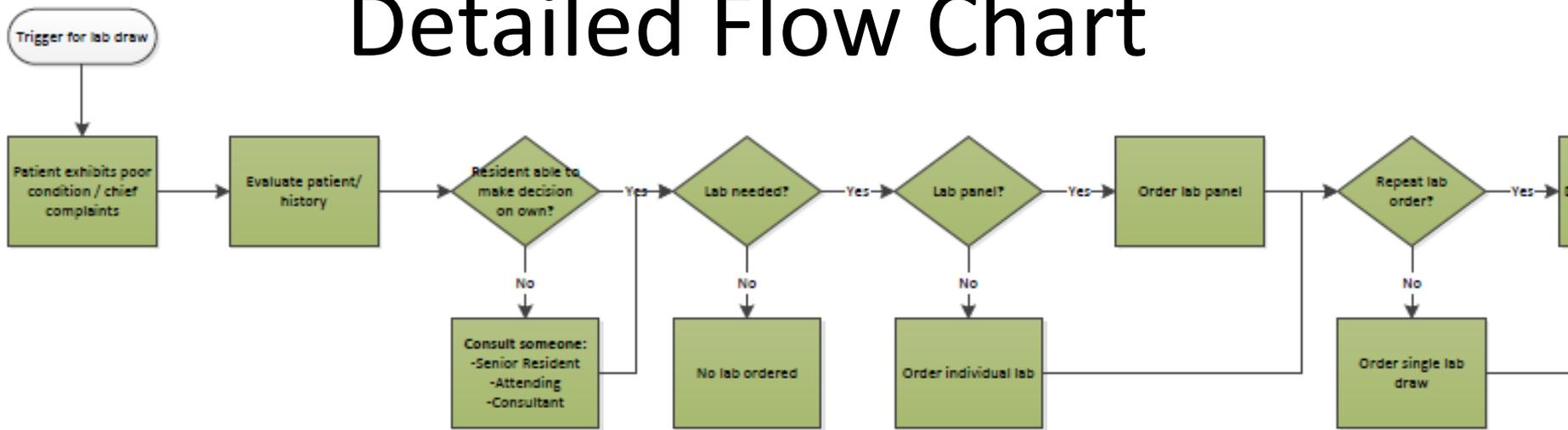- Numerator
- Outcome or Process Measure
- Balancing Measure

Tools for Developing Improvement Strategies

- Review PDSA/PDCA
- High-Level Block Diagram
- Detailed Flow Chart

*Record system how it currently exists, not as one believes it to be ➜These steps become targets for intervention

- Failure Mode and Effects Analysis (FMEA)
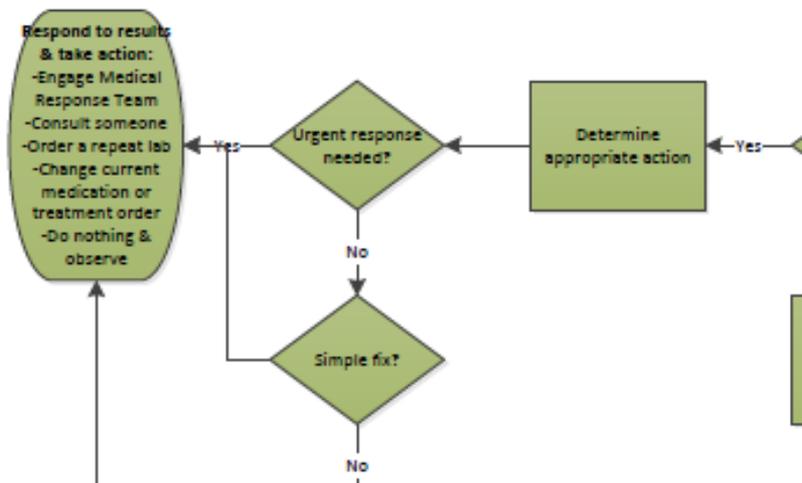- Supplier-Customer Flowchart
- Swim-Lane Diagram

Changes That Result in Improvement

DATA

Implementation of Change

Wide-Scale Tests of Change

Hunches Theories Ideas

Follow-up Tests

Very Small Scale Tests

Detailed Flow Chart

Trigger for lab draw

Patient exhibits poor condition / chief complaints → Evaluate patient/ history → Resident able to make decision on own? —Yes→ Lab needed? —Yes→ Lab panel? —Yes→ Order lab panel → Repeat lab order? —Yes→

Resident able to make decision on own? —No→ Consult someone: -Senior Resident -Attending -Consultant

Lab needed? —No→ No lab ordered

Lab panel? —No→ Order individual lab

Repeat lab order? —No→ Order single lab draw

Legend

RESIDENT
NURSE
LAB

Respond to results & take action: -Engage Medical Response Team -Consult someone -Order a repeat lab -Change current medication or treatment order -Do nothing & observe ←Yes— Urgent response needed? ←— Determine appropriate action ←Yes—

Urgent response needed? —No→ Simple fix? —No→

Mike Tchou's work to reduce unnecessary electrolyte tests in hospitalized children

Failure Mode Effects Analysis

Medication Dispensing Process

| Steps in the Process	Failure Mode	Failure Causes	Failure Effects	Likelihood of Occurrence (1-10)	Likelihood of Detection (1-10)	Severity (1-10)	Risk Profile Number (RPN)	Actions to Reduce Occurrence of Failure
Orders are written for new medications.	The first dose may be given prior to pharmacist review of the orders.	Medication ordered may be available and easily accessed in the dispensing machine.	Patient may receive incorrect medication, incorrect dose, or a dose via incorrect route.	6	5	1	30	Assign clinical pharmacists to patient care units so that all medication orders can be reviewed as they occur.
Orders are written to discontinue a medication or change the existing order.	Orders are written to discontinue a medication or change the existing order.	All doses needed for a 24-hour period are delivered to the drawer. Drawer is not changed until next routine delivery. 24-hour supply of refrigerated medications is delivered. Multi-dose vials may be kept in the patient-specific drawer. Medications are available in dispensing machine.	Patients may receive medications that have been discontinued or the incorrect dose of a medication that has been changed.	10	5	5	250	Schedule pick-ups of discontinued medications, including refrigerated medications, twice per day. Use dispensing machine screen to verify all information regarding current and discontinued medications prior to each administration.
Orders are written for a non-standard dose of a medication.	Nursing staff may prepare an incorrect dose when manipulating the medication.	Staff prepare the dose using medications from the dispensing machine and manipulate them to get the dose ordered.	Patient may receive an incorrect dose.	3	5	4	60	Prepare all non-standard doses in the pharmacy and dispense each as a patient-specific unit dose.

Key Driver Diagram
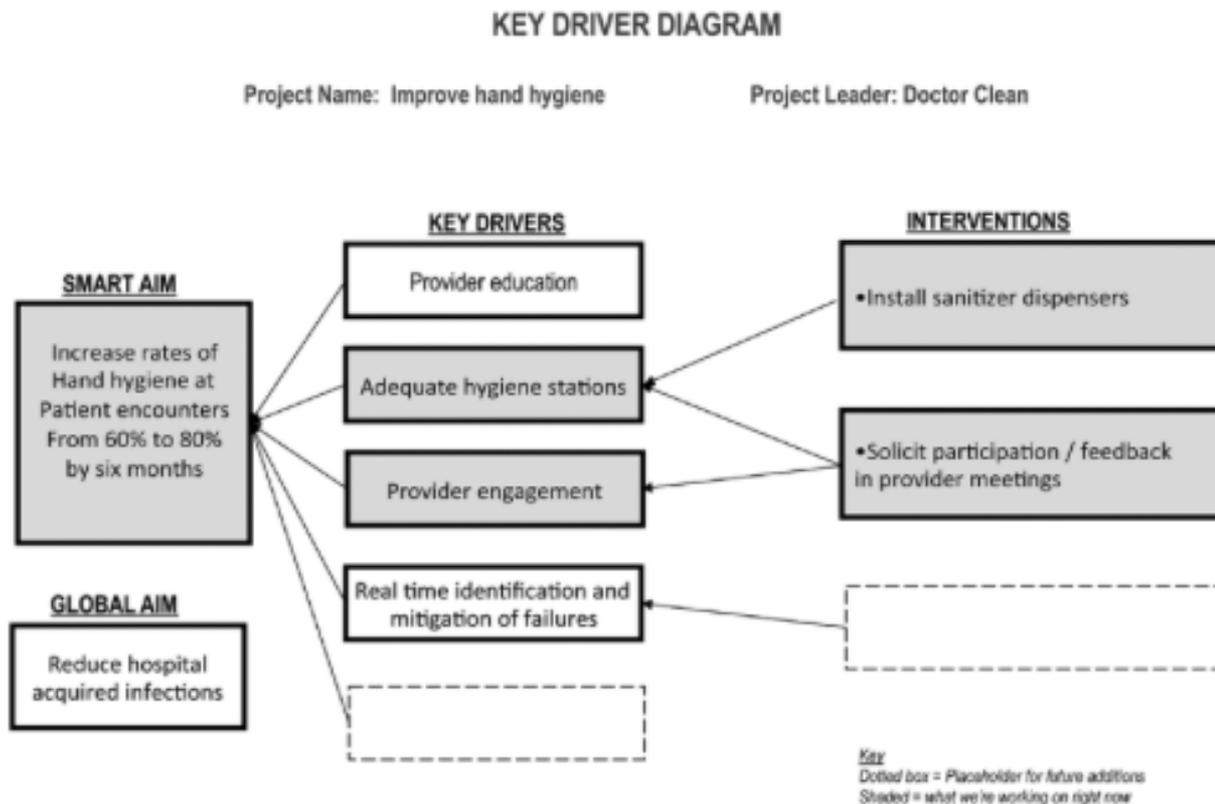
Figure 3. Key driver diagram for project to improve hand-hygiene rates.

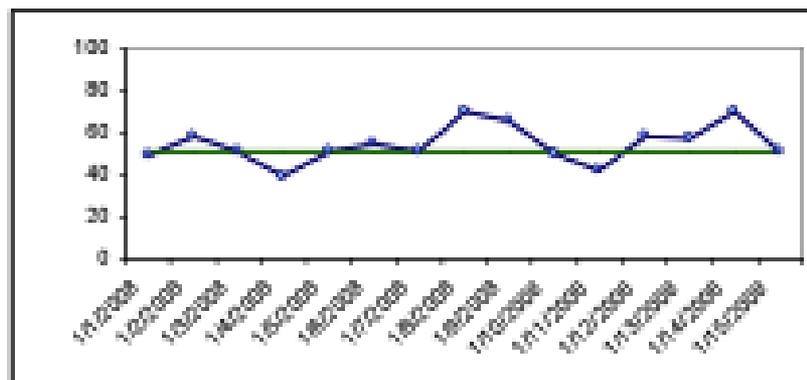Shaughnessy, JPIDS 2017
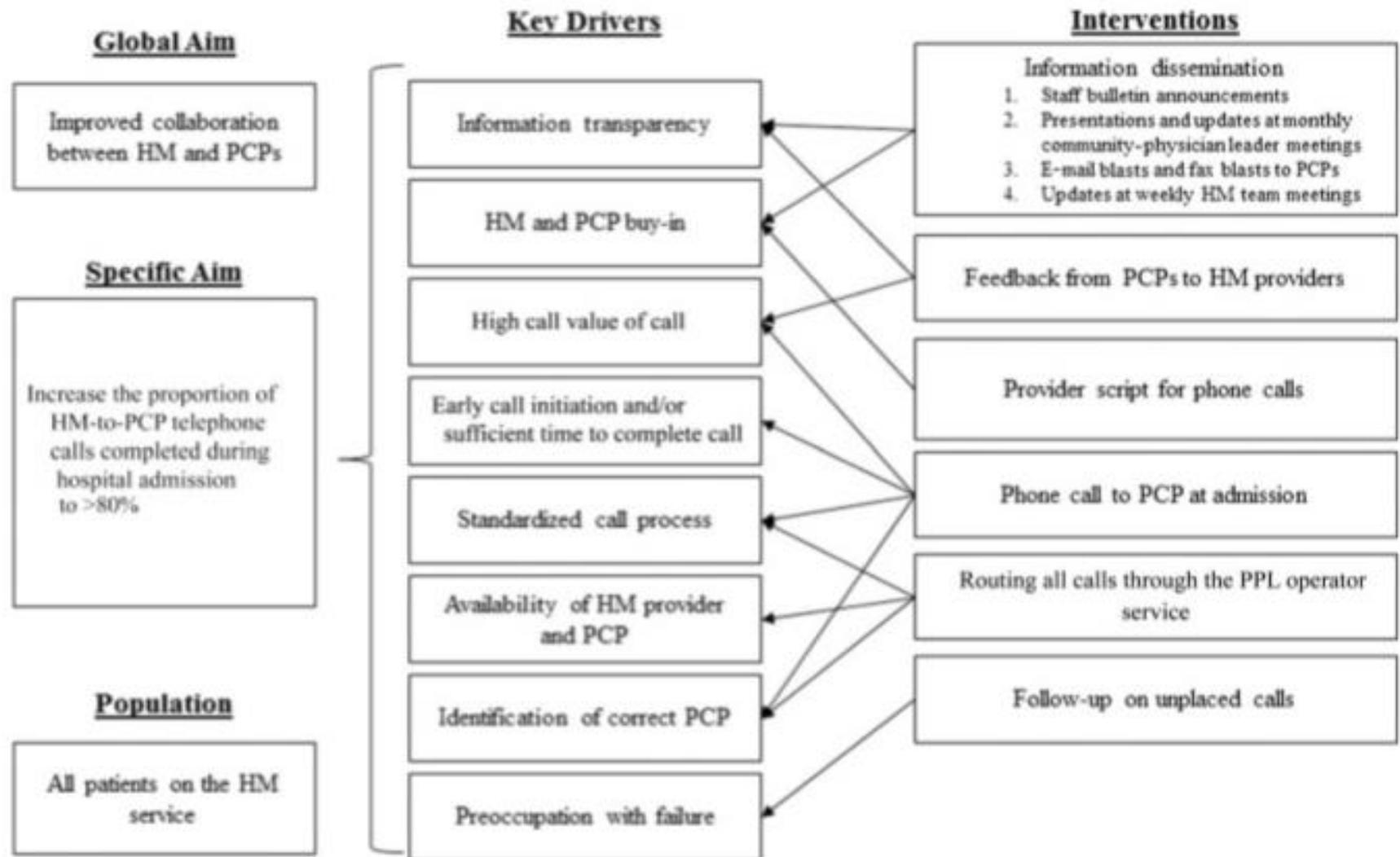
Plotting Data Over Time – Run Chart
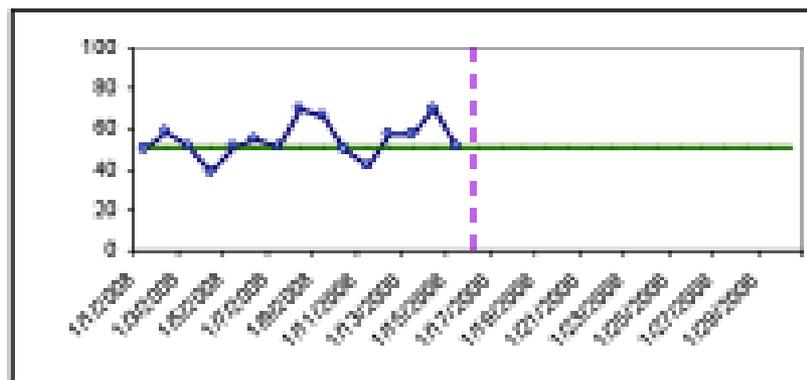

ED 'Walk Aways' Over Time
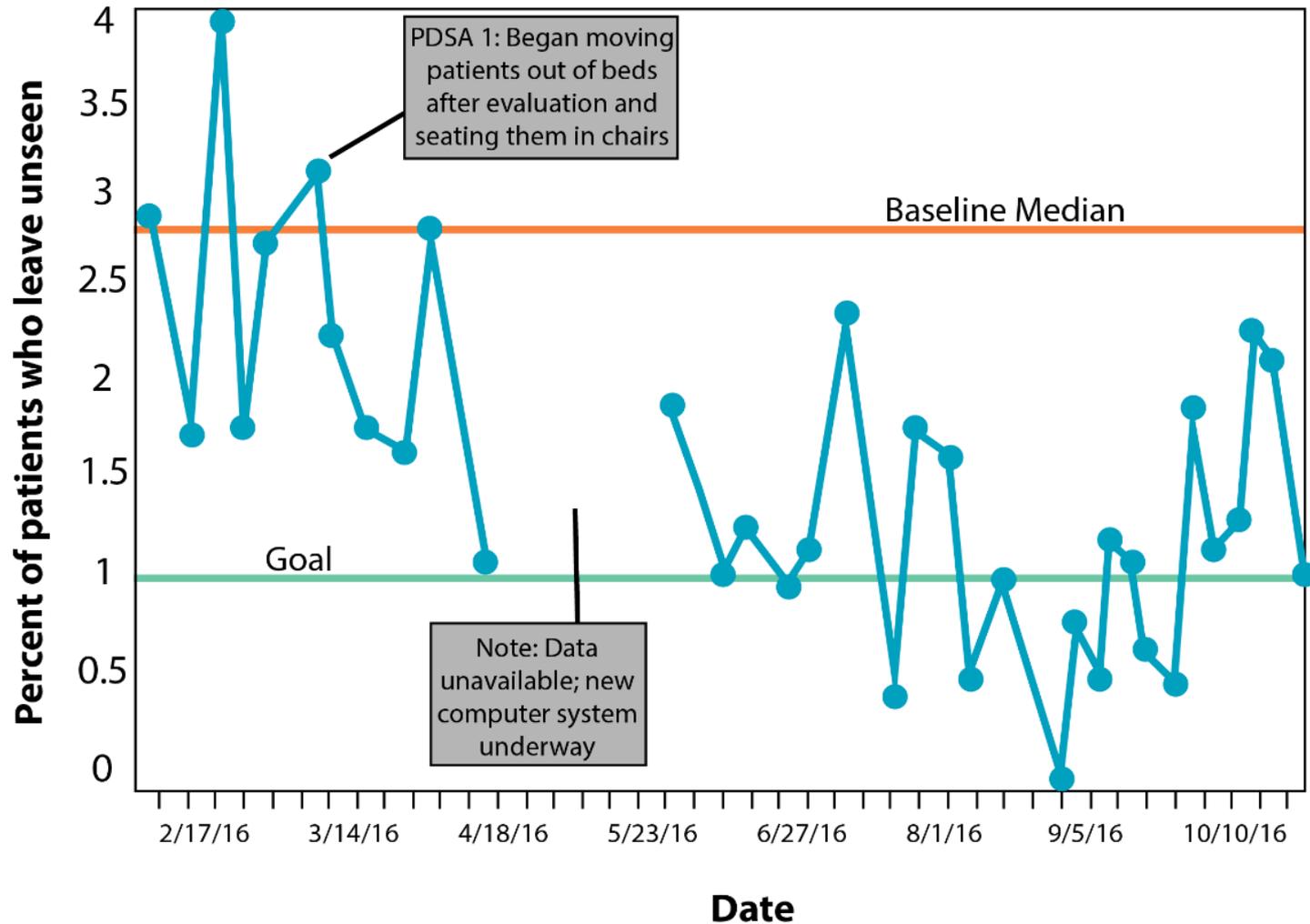
Testing a Change with a Run Chart
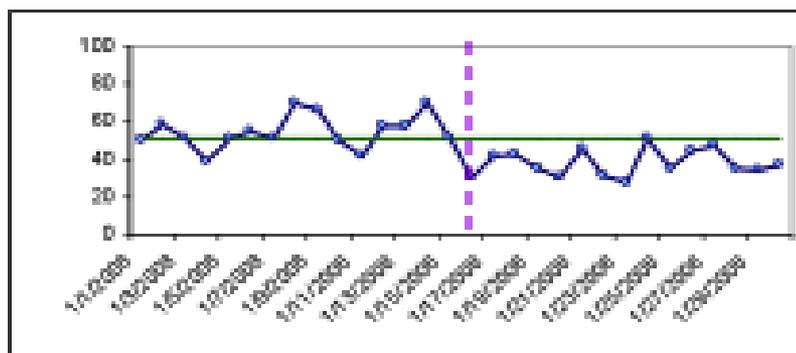
1. Plot the baseline
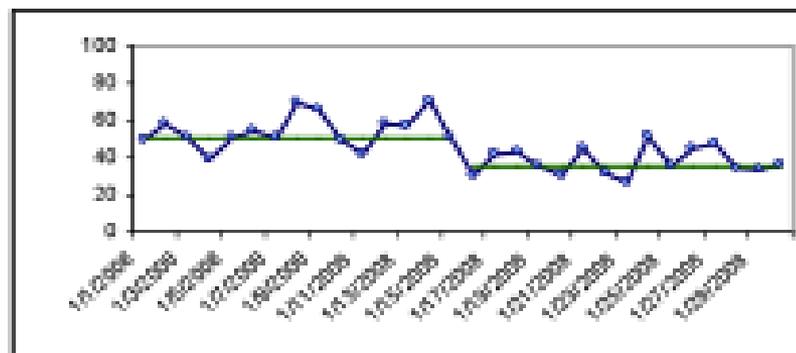

2. Extend the median & begin the test

Testing a Change with a Run Chart

3. Continue to plot data
   following the change

4. Apply the rules

5. If there was a signal,
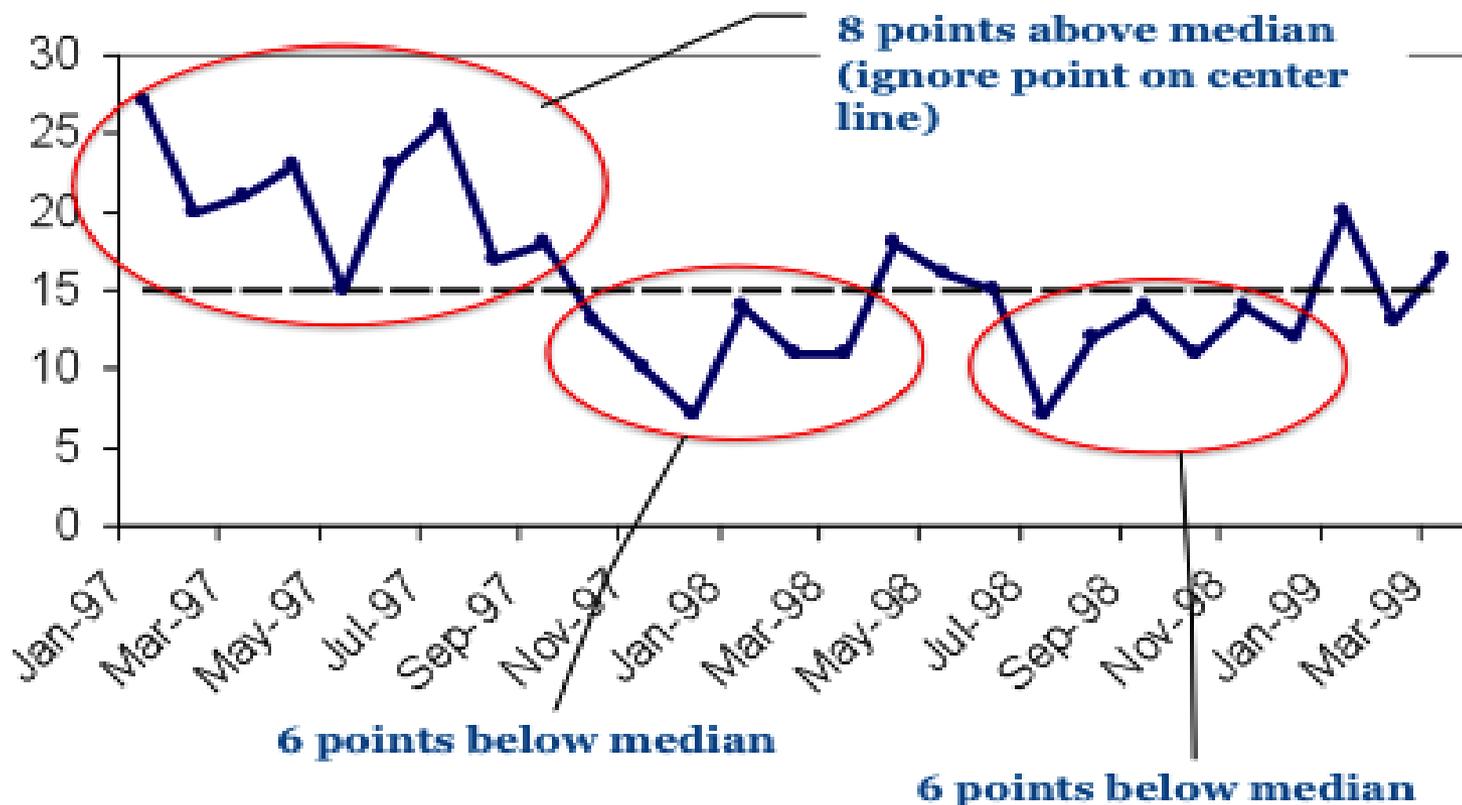   re-plot with new
   median

A Run

- A run is a sequence of consecutive points which all lie on the same side of the line
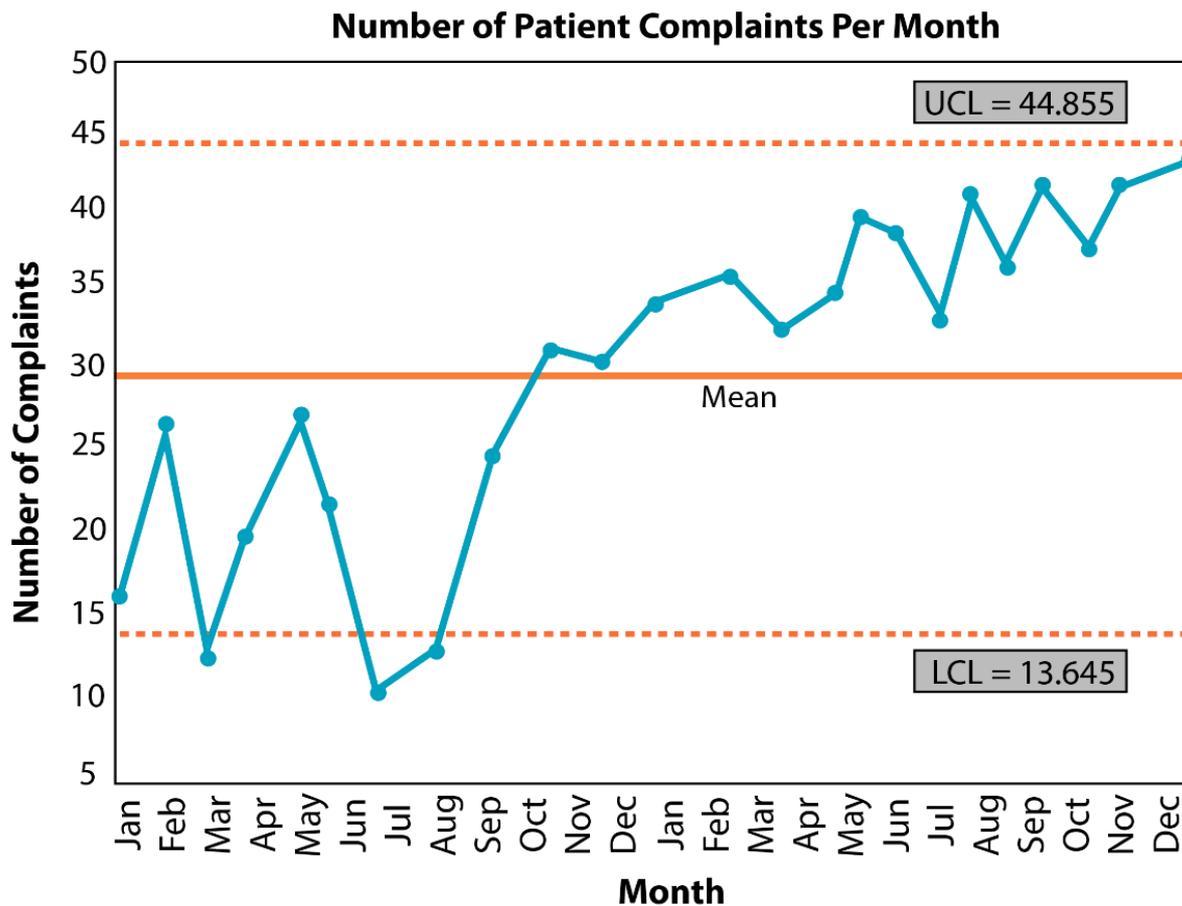
- Ignore points exactly on the line!

Control Chart

There's so much more to learn…

- Static Vs. Dynamic Data
- Driver Diagrams
- Family of Measures
- Cause and Effect Diagrams
- Divergent & Convergent Thinking
- Force Field Analysis
- Pareto Analysis
- And much more…

IHI resources

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Special Thanks…

- Faculty Development Team – Dr. Kupesic and Dr. Mulla

- The other speakers

- IHI – Tons of great free QI education and toolkit

- APA QSIS Program