QI Session: Project Review and Run Chart Interpretation

3.25.22

Overview: Roadmap

Date	Lecture Topic
July 2021	**Problem Statement, Age-Friendly Health System Walkthrough**
August 2021	**Setting an aim, identifying your initial and target states**
September 2021	**Performing a gap analysis**
December 2021	**AGS abstract (optional); Healthcare Equity**
January 2022	**Proposing Countermeasures**
February 2022	**Making a Plan**
March 25 2022	**Results (Check) and Next Steps (Act)**
June 2022	**Wrap Up**
June 2022	QI project presentation at Grand Rounds (optional) AGS Abstract submit 2023 (optional)

Other components: Monthly QI check ins about your Project, Modules, Performance metrics on your patient panel (VA Primary Care), M&Ms

A3 (lean) approach to QI

A3 Problem-Solving Report

UC San Diego Health

Title: _____   Date/Revision(s): _____
Owner: _____   Location: _____
Team Members: _____

1. Problem Statement:
What are you trying to solve or improve?

2. Current Condition:
Where do things stand today?

3. Target Condition:
What outcome is required? Remember SMART

4. Gap Analysis:
What is the root cause(s) of the problem?

5. Countermeasures Proposed:
How will your recommended countermeasures affect the root causes to achieve the target?

6. Plan:
What activities will be required for implementation and who will be responsible by when?

7. Results (Check) Next steps (Act):
What did you learn about the results of your experiment vs. the target? What are your next steps?

Agenda

- Project Review and Next Steps

- Run Charts
- Applied example

Project Review

Where we are in our A3

Last Session Action Items

[ ] Feedback from Dr. Poses

[ ] Feedback from patients (ask memory care nurse on whether and how to get feedback from a patient or family about the letter)

[ ] test on a few patients

[ ] Read Run Chart articles

Next Steps

Next Steps on the A3

COUNTERMEASURES (changes) PROPOSED
- describe, predict what will happen

PLAN
- Member, complete by, task
- Communication/education plan

RESULTS
- Metric (process and outcome measures)
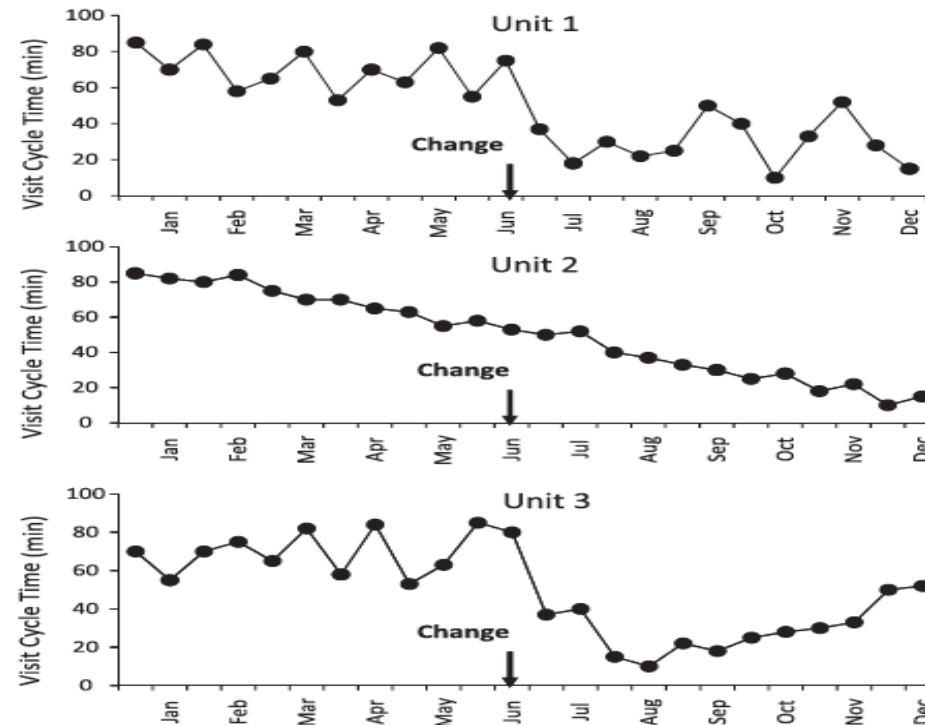- Target
- Time checkpoints: 1, 2, 3

Run Charts

-
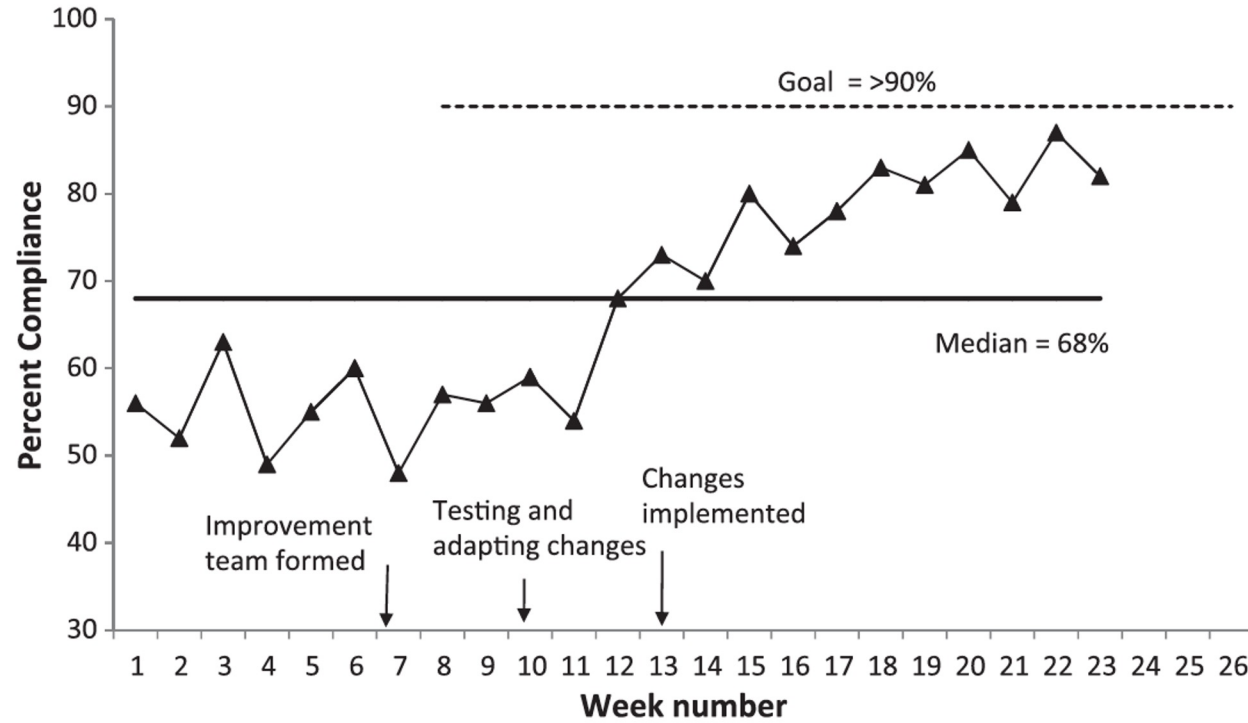
Figure 1 Example of a run chart demonstrating compliance with a standard procedure.

Value of time-ordered data (QI run chart) vs. summary stats (traditional research)
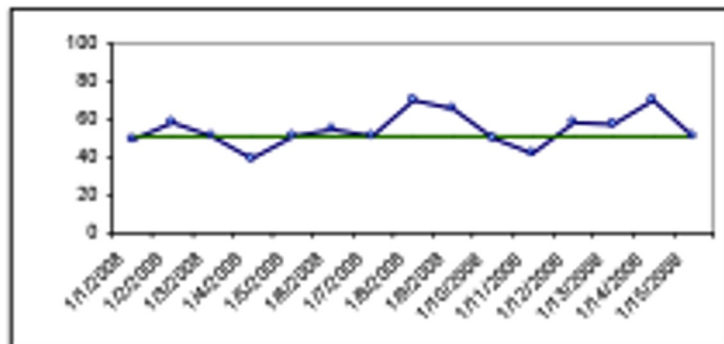
Traditional Research

QI Research

Cycle Time Results for Units 1, 2 and 3

Avg. Before Change SD = 11.36 — 70

Avg. After Change SD = 13.15 — 30

$t(22) = 7.88, p < .001$
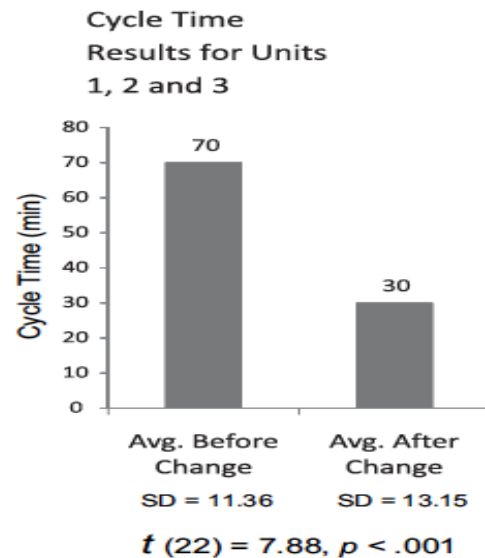
Unit 1: sustainable improvement achieved

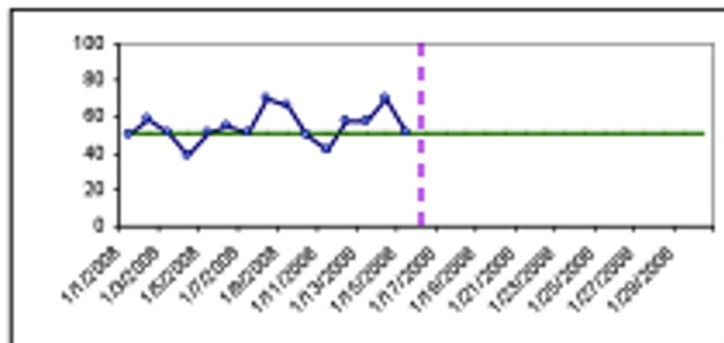Unit 2: same bar chart, but improvement was occurring BEFORE the intervention

Unit 3: same bar chart, but improvement NOT sustained

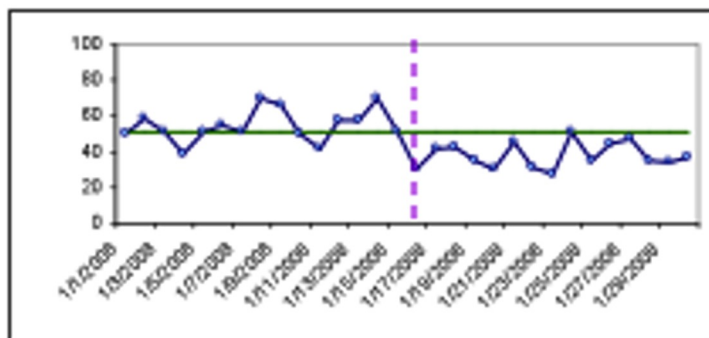# Testing a Change with a Run Chart

1. Plot the baseline
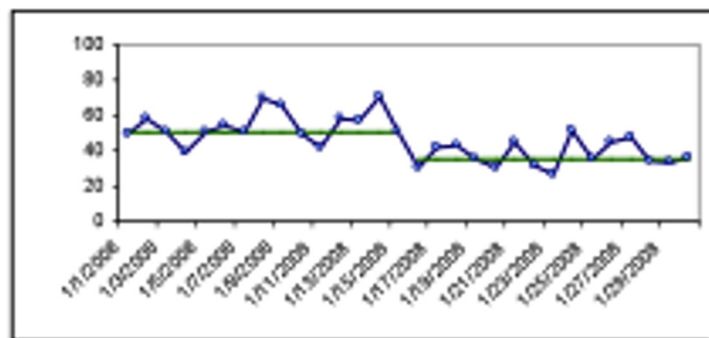

2. Extend the median & begin the test

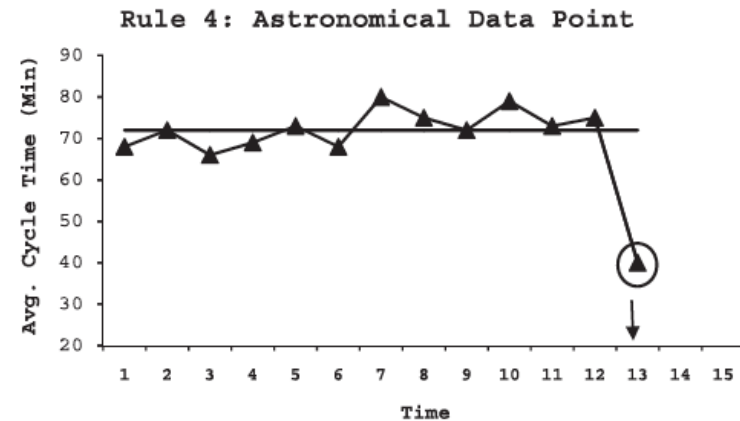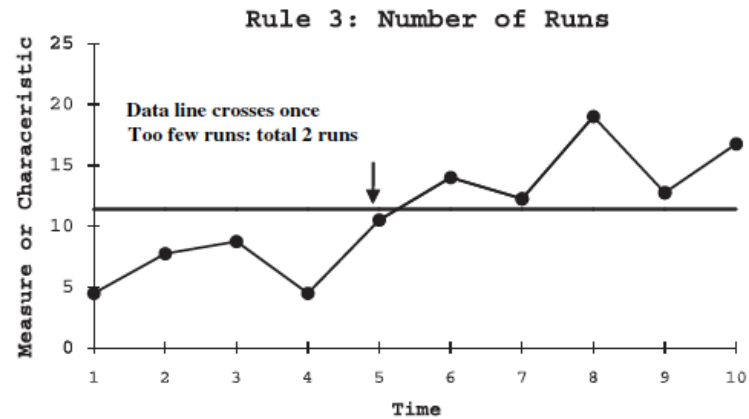# Testing a Change with a Run Chart
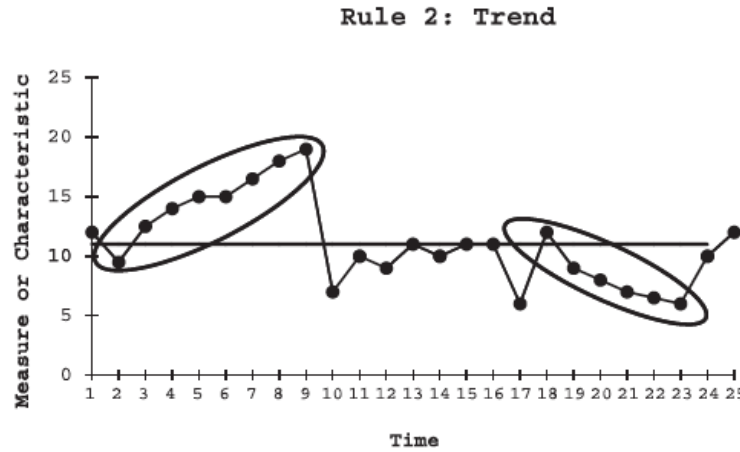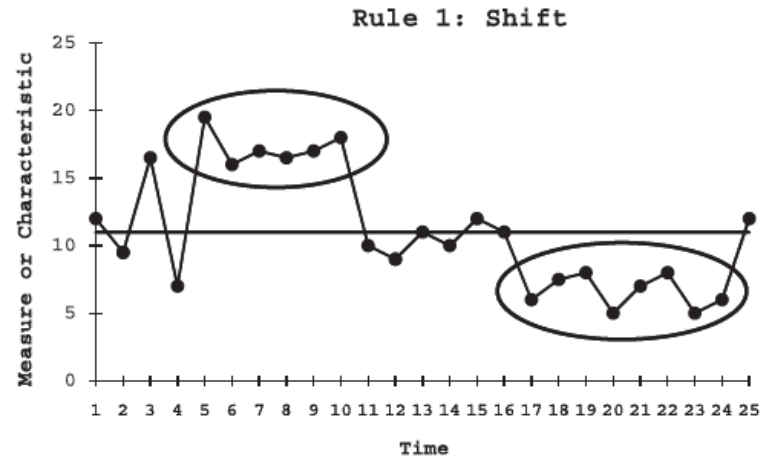
3. Continue to plot data following the change

4. Apply the rules

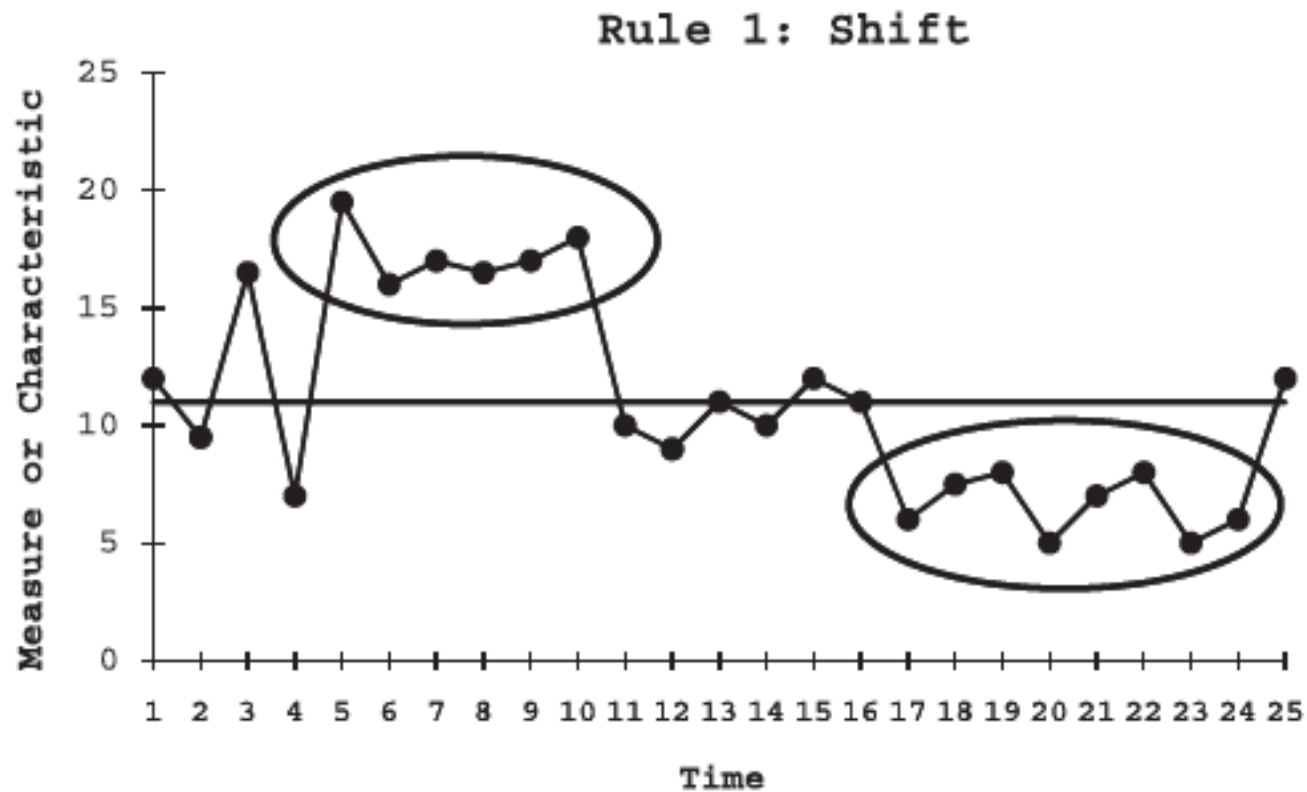5. If there was a signal, re-plot with new median

Rules for Interpretation-
Perla et al., BMJ Qual Saf 2011

Goal of rules is to find a signal, or **non-random signals in the data** that represents the impact of your change on the system
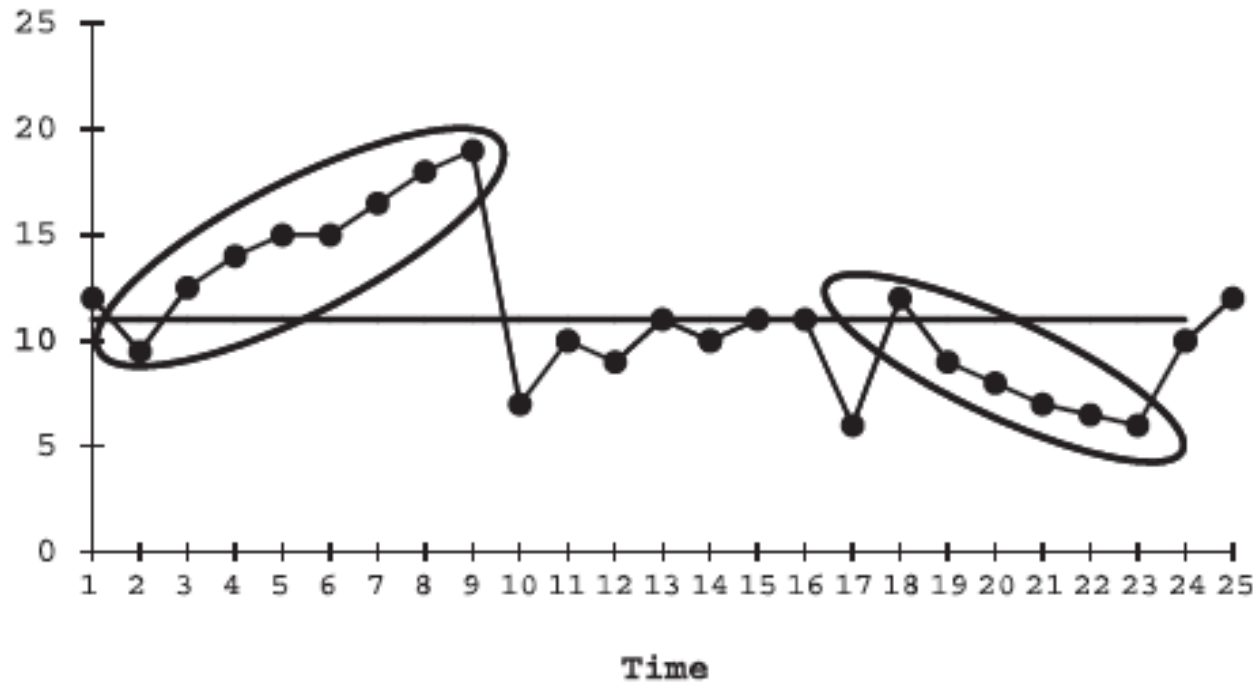
Rule 1: shift

Six or more consecutive points either all above or all below the median.
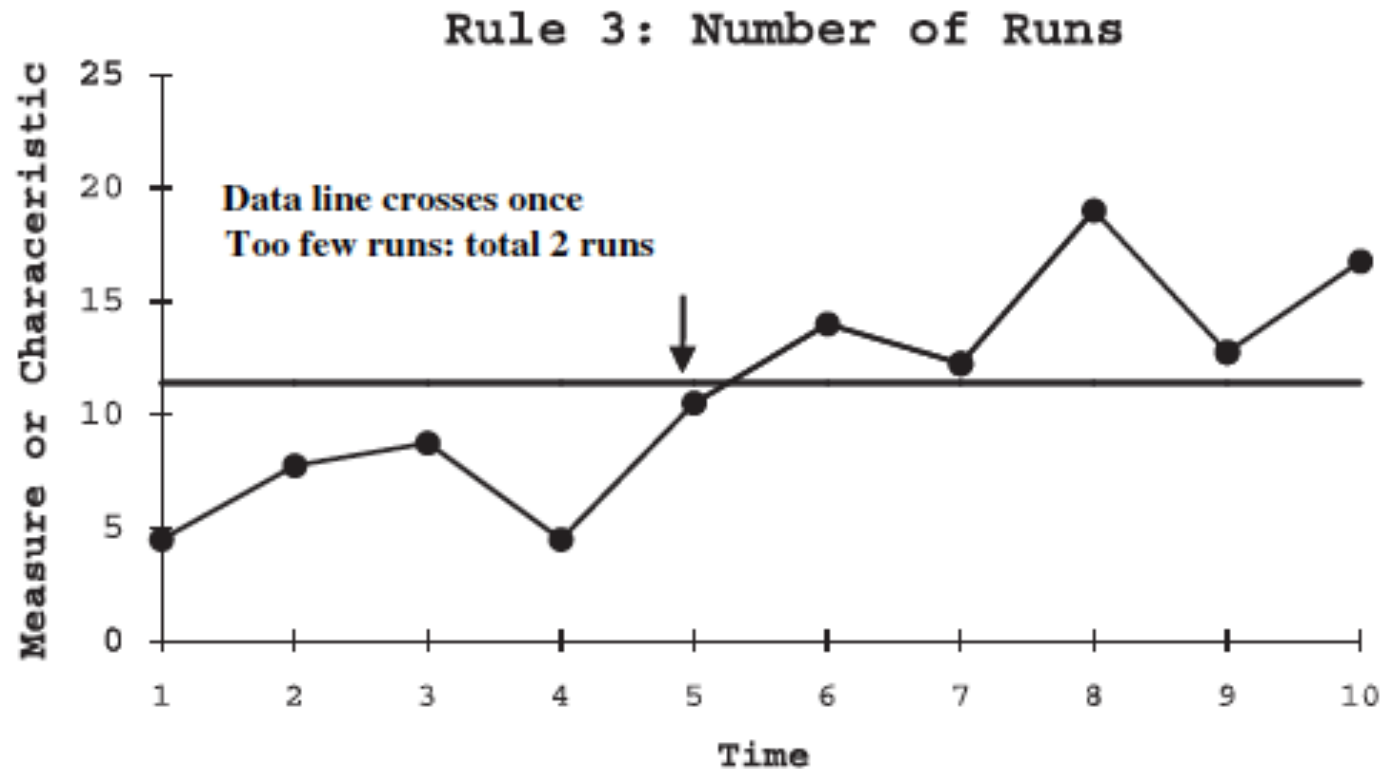
Rule 2- trend

Rule 2: Trend

Five or more consecutive points all going up or all going down.

Rule 3- Number of Runs

A run is a series of points in a row on one side of the median. A non-random pattern is signaled by too few or too many runs, or crossings of the median line.

Table for determination of too many or too few runs

Total number of data points on the run chart that do not fall on the median	Lower limit for the number of runs (< than this number runs is 'too few')	Upper limit for the number of runs (> than this number runs is 'too many')
10	3	9
11	3	10
12	3	11
13	4	11
14	4	12
15	5	12
16	5	13
17	5	13
18	6	14
19	6	15
20	6	16
21	7	16
22	7	17
23	7	17
24	8	18
25	8	18
26	9	19
27	10	19
28	10	20
29	10	20
30	11	21
31	11	22
32	11	23
33	12	23
34	12	24
35	12	24

Table 1 Checking for too many or too few runs on a run chart. Table is based on about a 5% risk of falling the run test for random patterns of data

Depending on the number of data points, a certain number of runs are expected IF the process is random

Rule 4- Astronomical Data Point

Rule 4: Astronomical Data Point
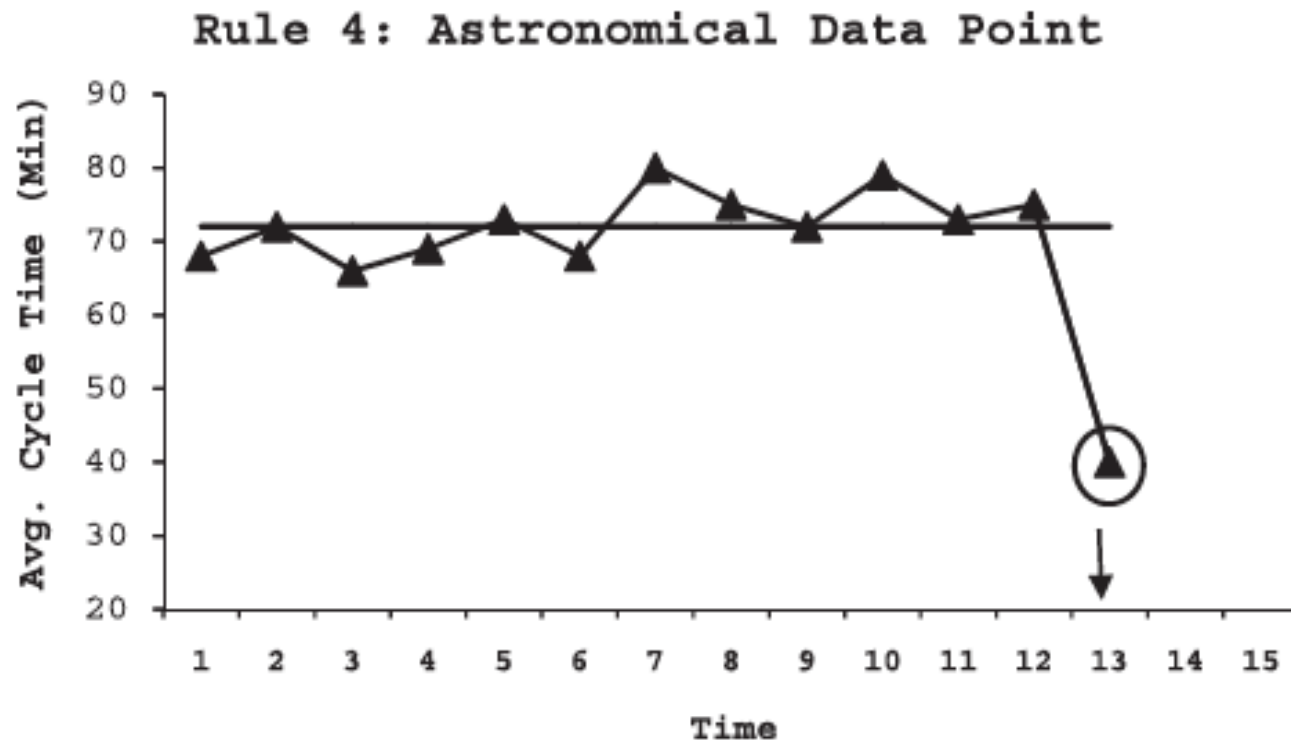
One that is obviously, even blatantly, different from the rest of the points; all studying the chart would agree that the point is unusual

Applied Example

- Excel Template with fellows example

Summary

- Run charts are an easy way of displaying time-ordered data that help you assess the impact of a quality improvement intervention

- More helpful than summary statistics for assessing the true impact and sustainability of a change that you made

- You don't have to memorize the rules. Consider googling rules for run charts or referencing Perla et al., 2011 BMJ Qual for a great summary of how to do run charts and apply their rules