

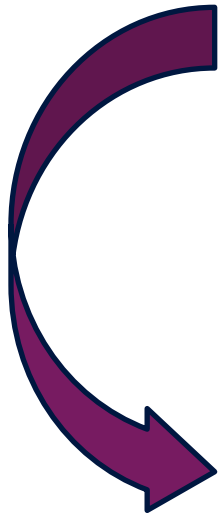
UPMC | Donald D. Wolff Jr.
Center for Quality,
Safety, and Innovation

Understanding a Run Chart 101

QI Tools for Looking at Data over Time

Run chart

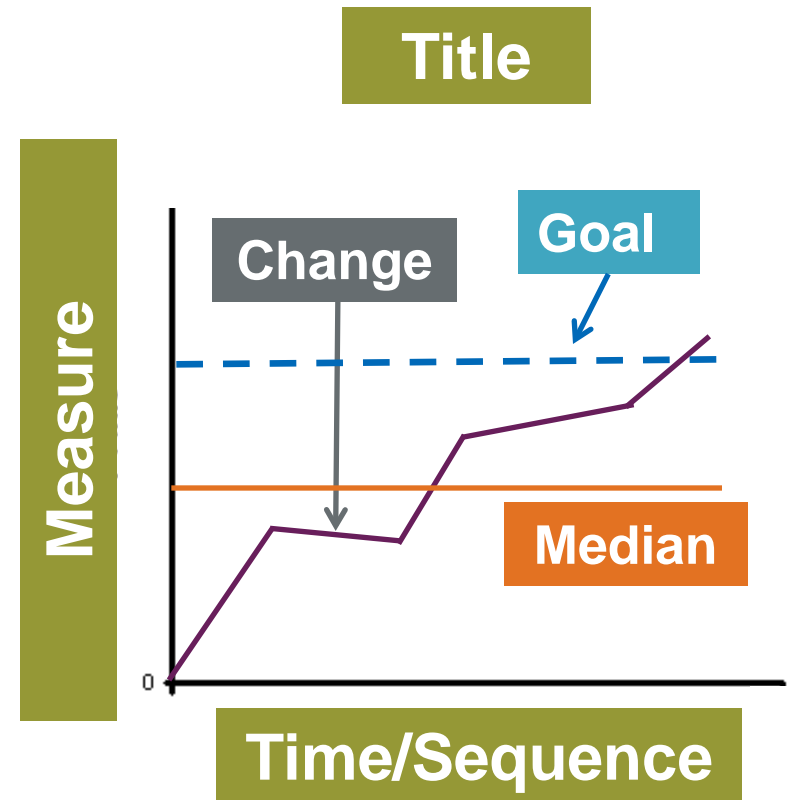
Control chart



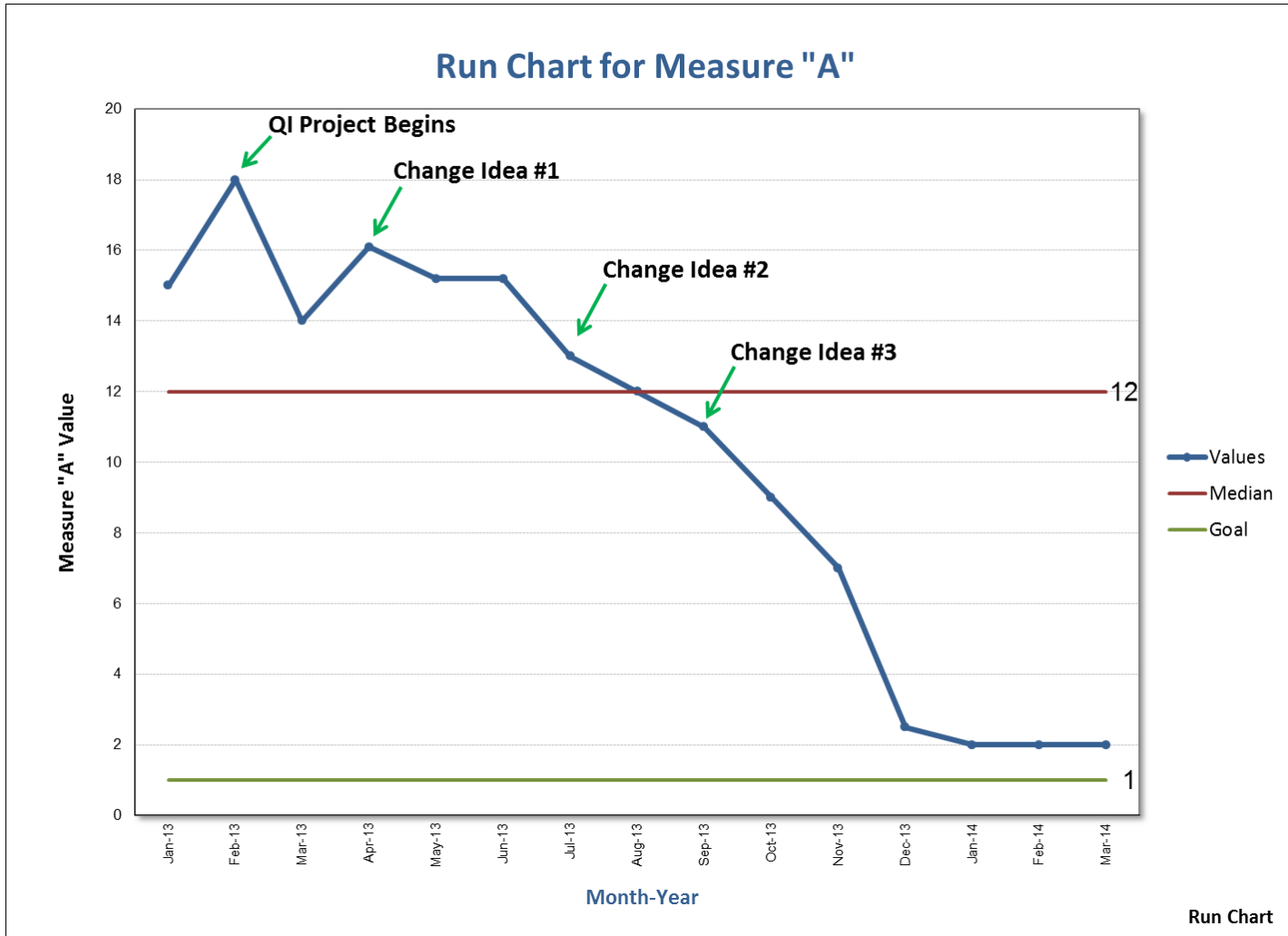
**Where have we been,
where are we now, and
how far are we from our goal?**

Displaying Data: The Run Chart

- ❖ x and y axes
- ❖ Label axes
- ❖ Title chart
- ❖ Add data and goal
- ❖ Median will generate
- ❖ Show start of change
- ❖ Include baseline and post- change data



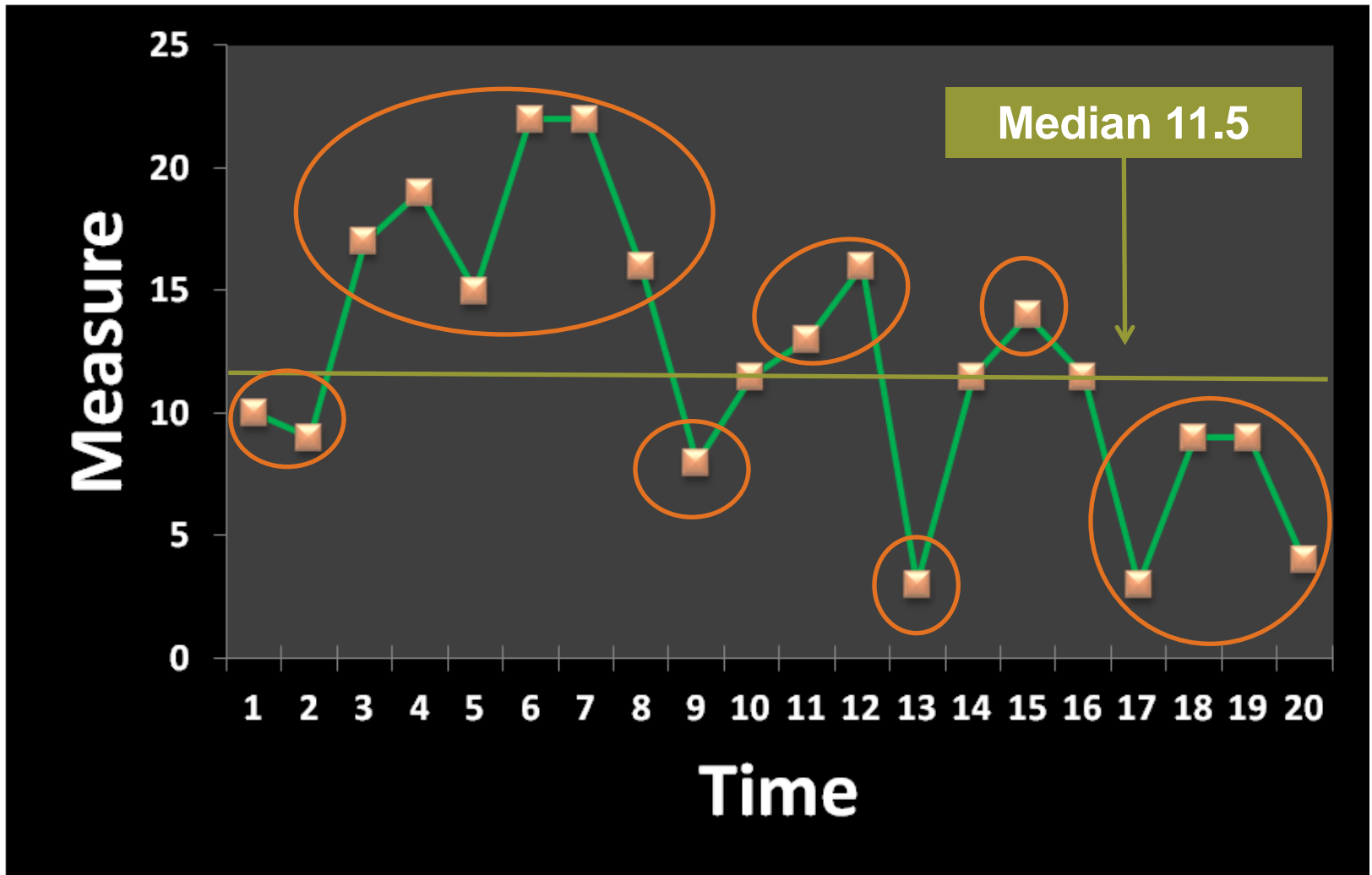
Run Chart



What is a Run?

- ❖ **One or more consecutive data points on the same side of the median**
- ❖ **Called a run chart because the data line “runs” back and forth across the median**
- ❖ **Don’t include points falling on the median**
- ❖ **Count # of clusters of data and circle them **or** count # of times the line crosses the median and add 1**

Counting Runs



Rules to Detect Non-Random Variation

Shift

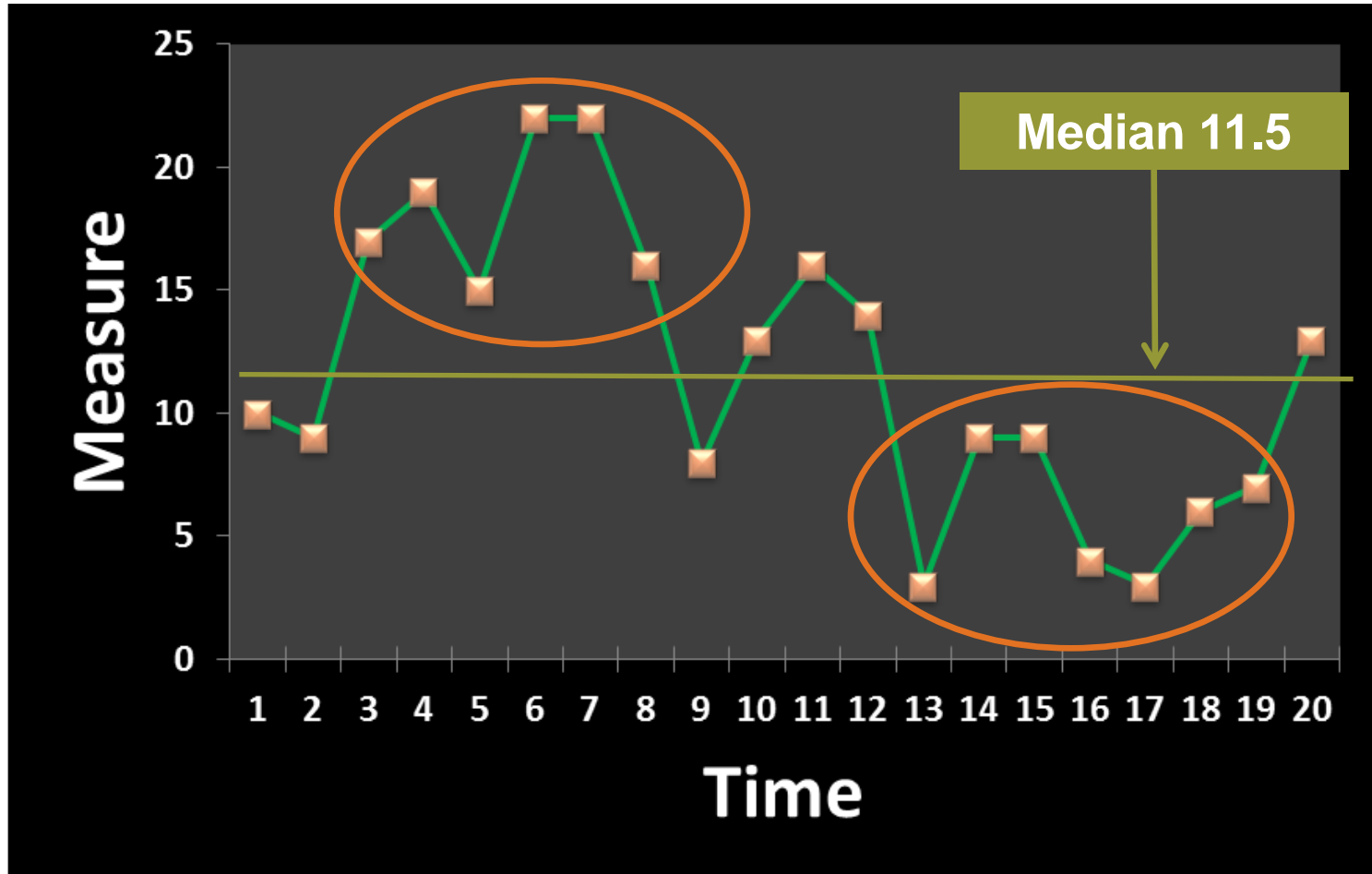
Trend

**Too many or
too few runs**

**Astronomical
data point**

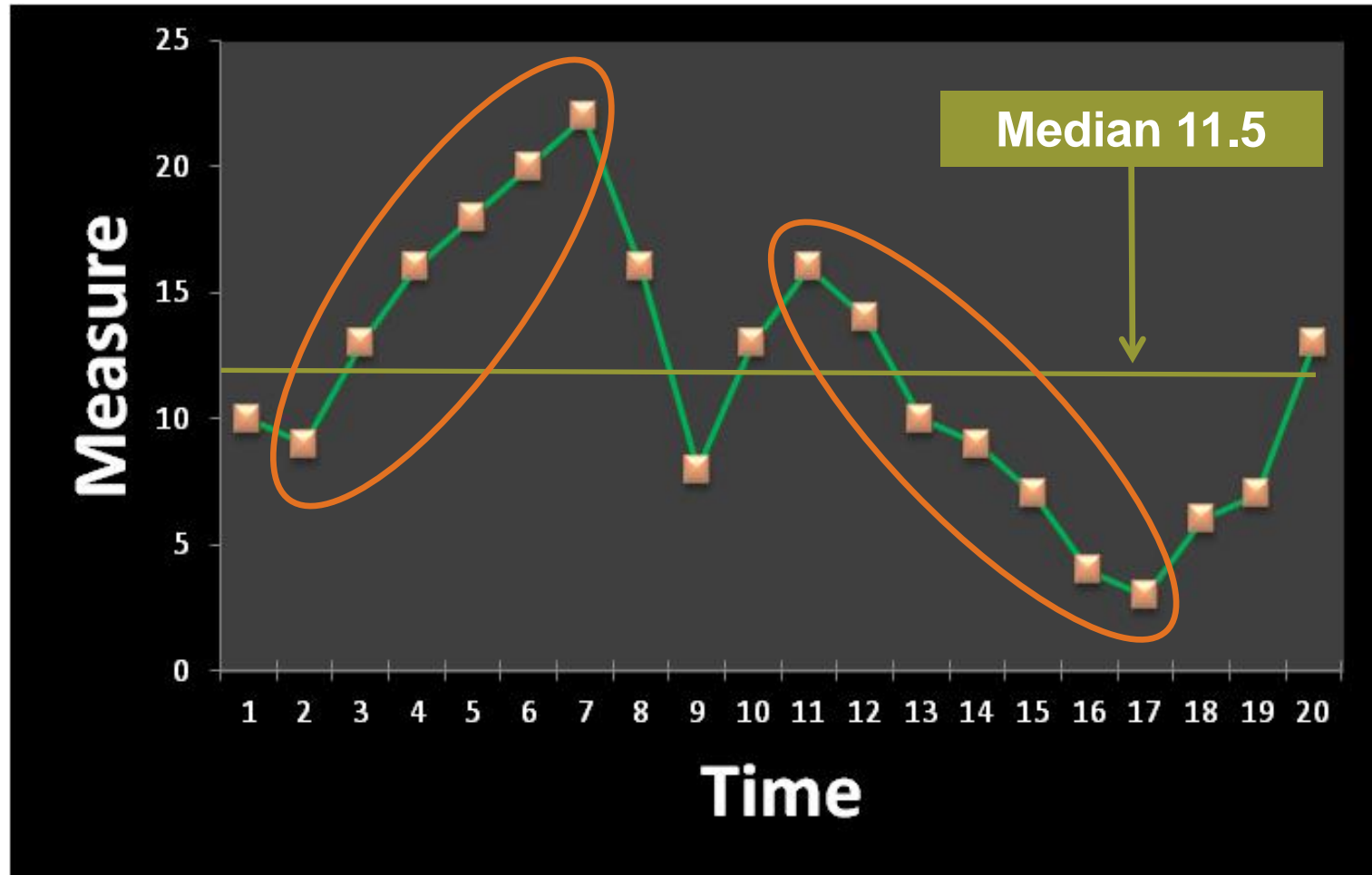
Rule 1: Shift

6 or > consecutive data points all above or all below median

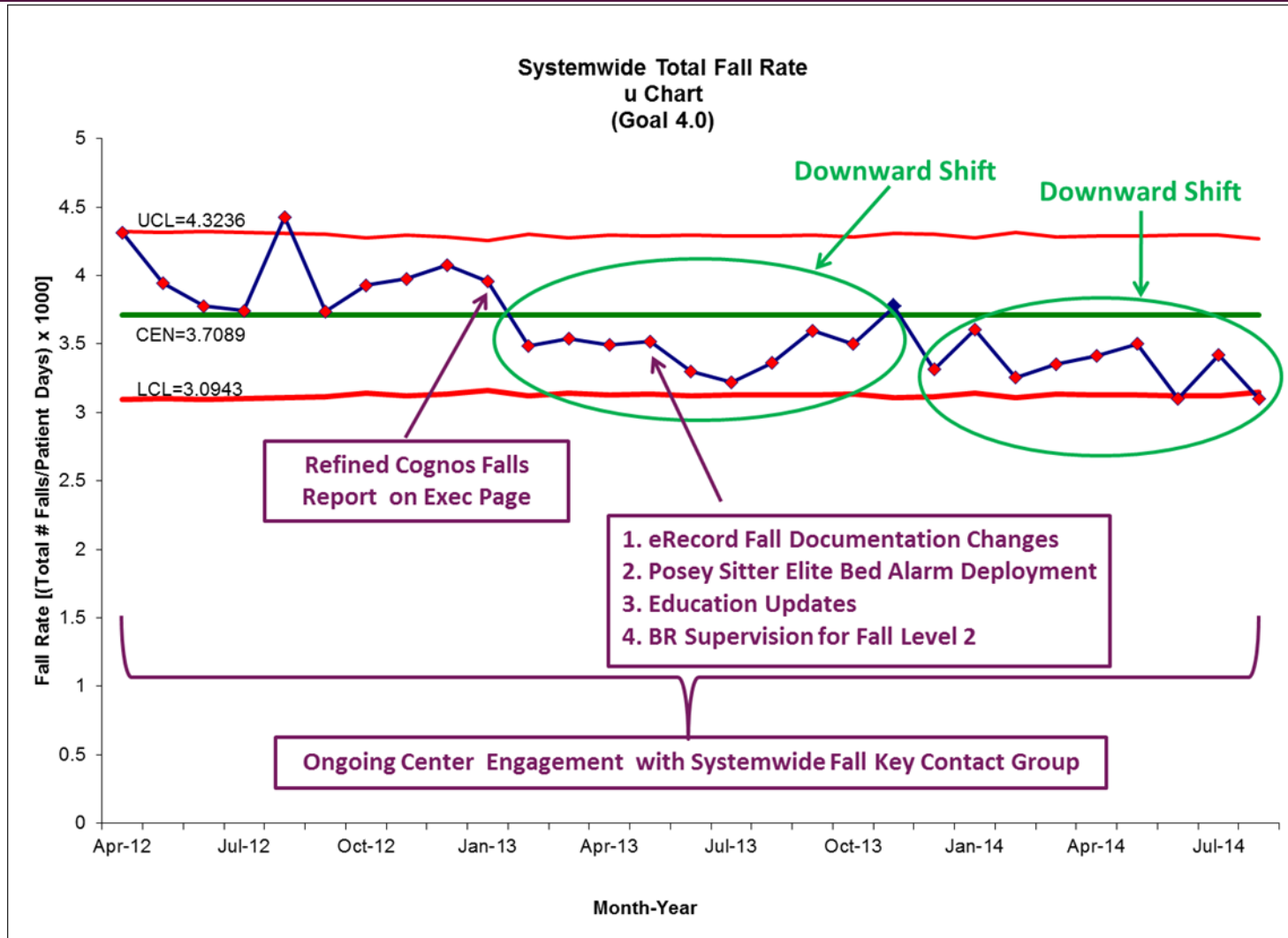


Rule 2: Trend

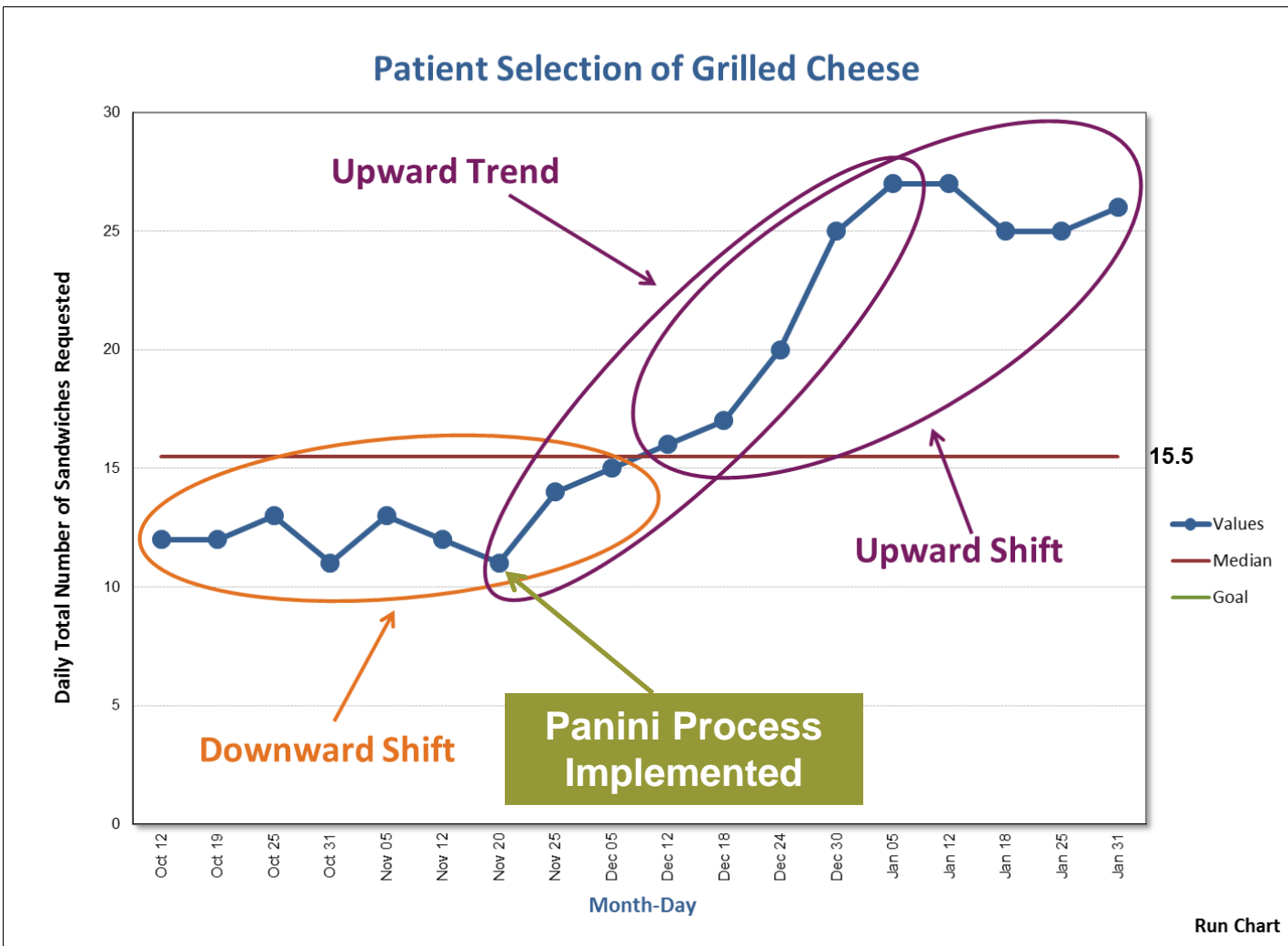
5 or > consecutive data points all going up or all down



Falls Control Chart

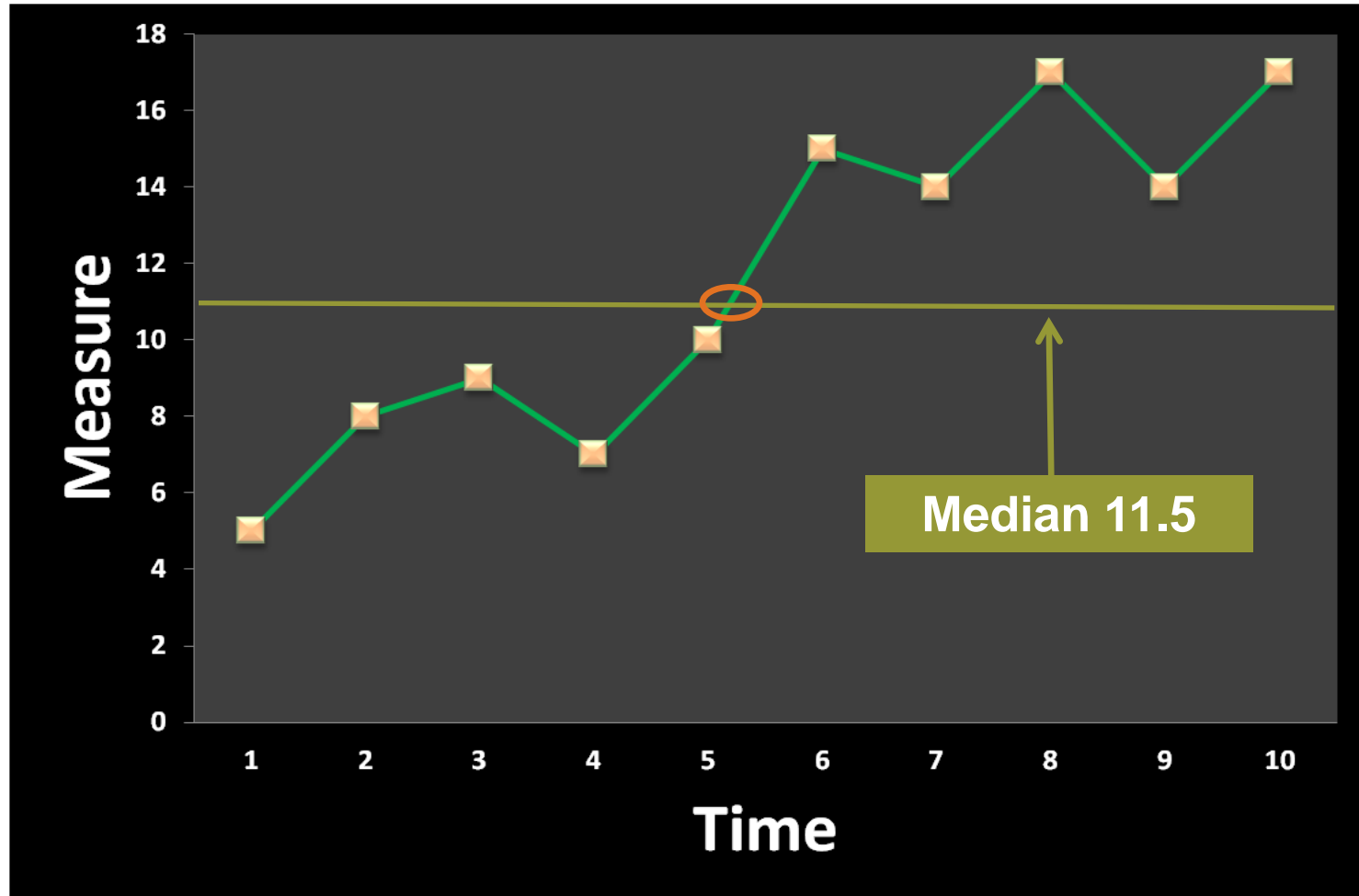


Run Chart (Process Measure)

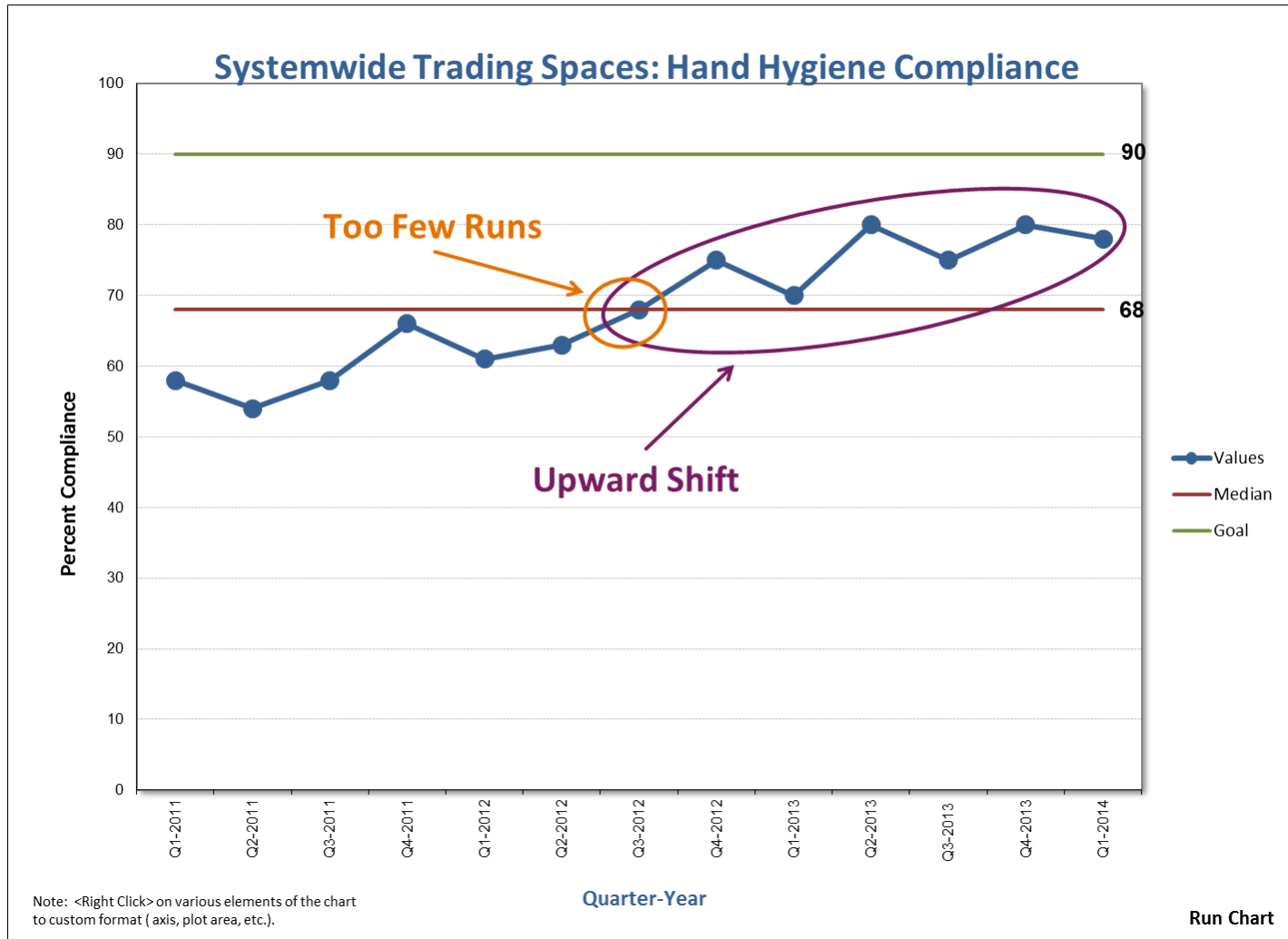


Rule 3a: Too few runs

Data line crosses median too few times

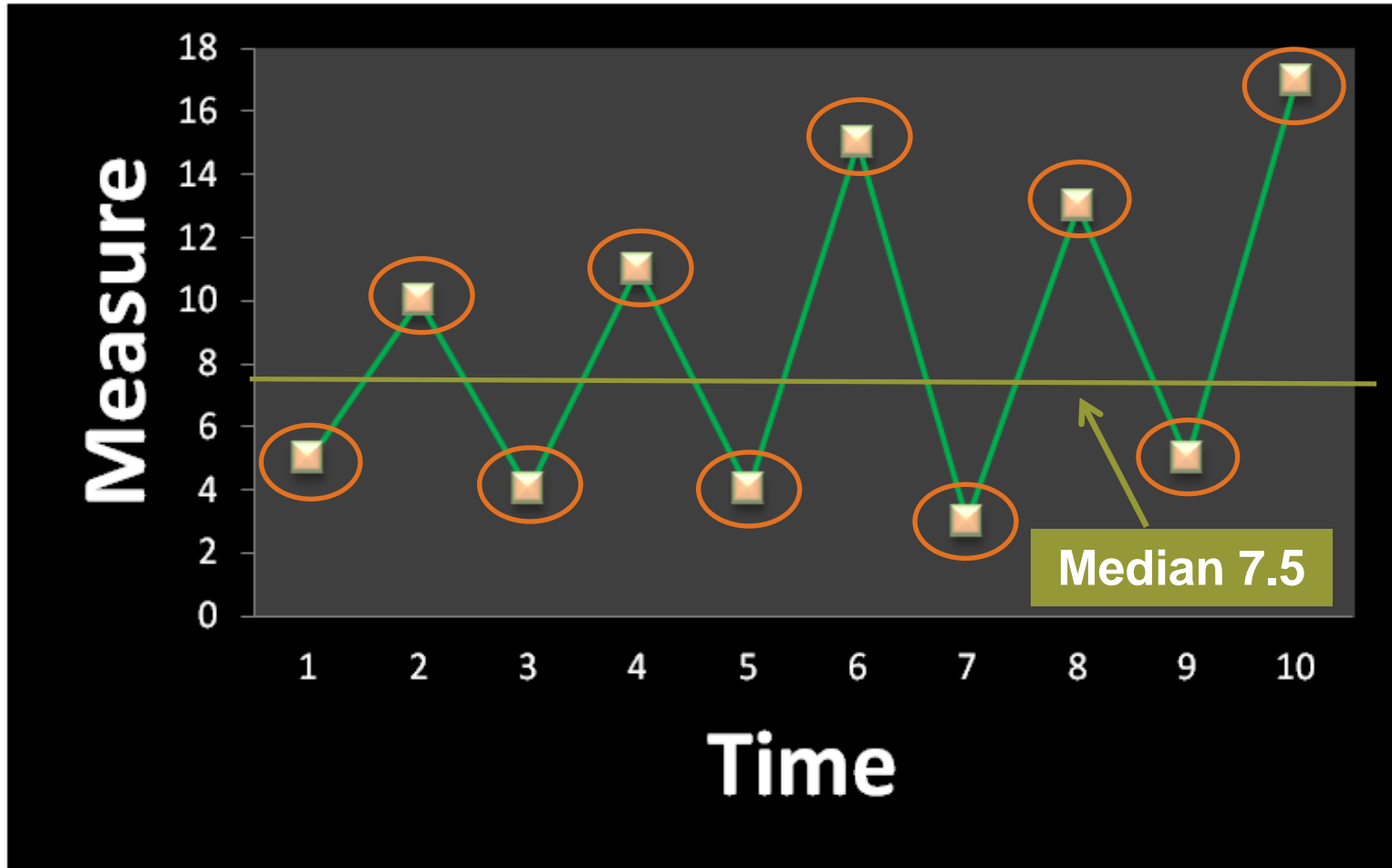


Run Chart (Process Measure)

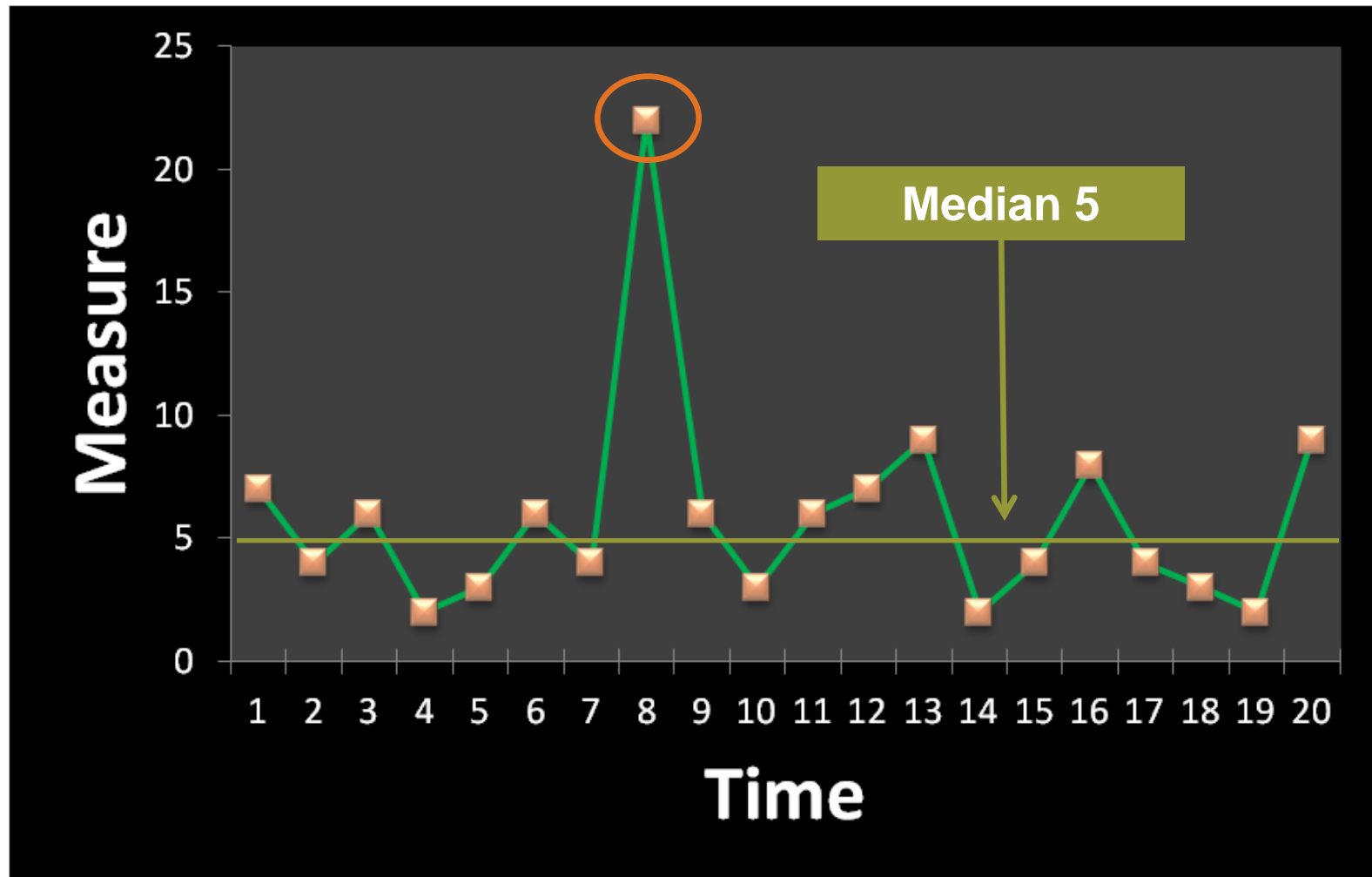


Rule 3b: Too many runs

Data line crosses median too many times



Rule 4: Astronomical data point



Run Chart Template: Tab 1

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Run Chart Template

Enter your chart title and axis labels below.

Chart Title: <TITLE>

Horizontal (X) Axis Label: <DATE> (unit of time or sequence) *For example: Hour, Day, Shift, Week, Month, Quarter, etc.*

Vertical (Y) Axis Label: <WHAT I AM MEASURING> (what is being measured) *For example: Number of Infections, Percent of Labs Received within 24hrs, Average Wait Time in Minutes, Number of Appointments per Day, etc.*

Enter the date of measurement in this column.

Enter the measurement value in this column.

	Date	Measurement Value	Median	Goal
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Enter the goal value in this cell.

Static versus Dynamic Views of Data

Static: Before/After Data

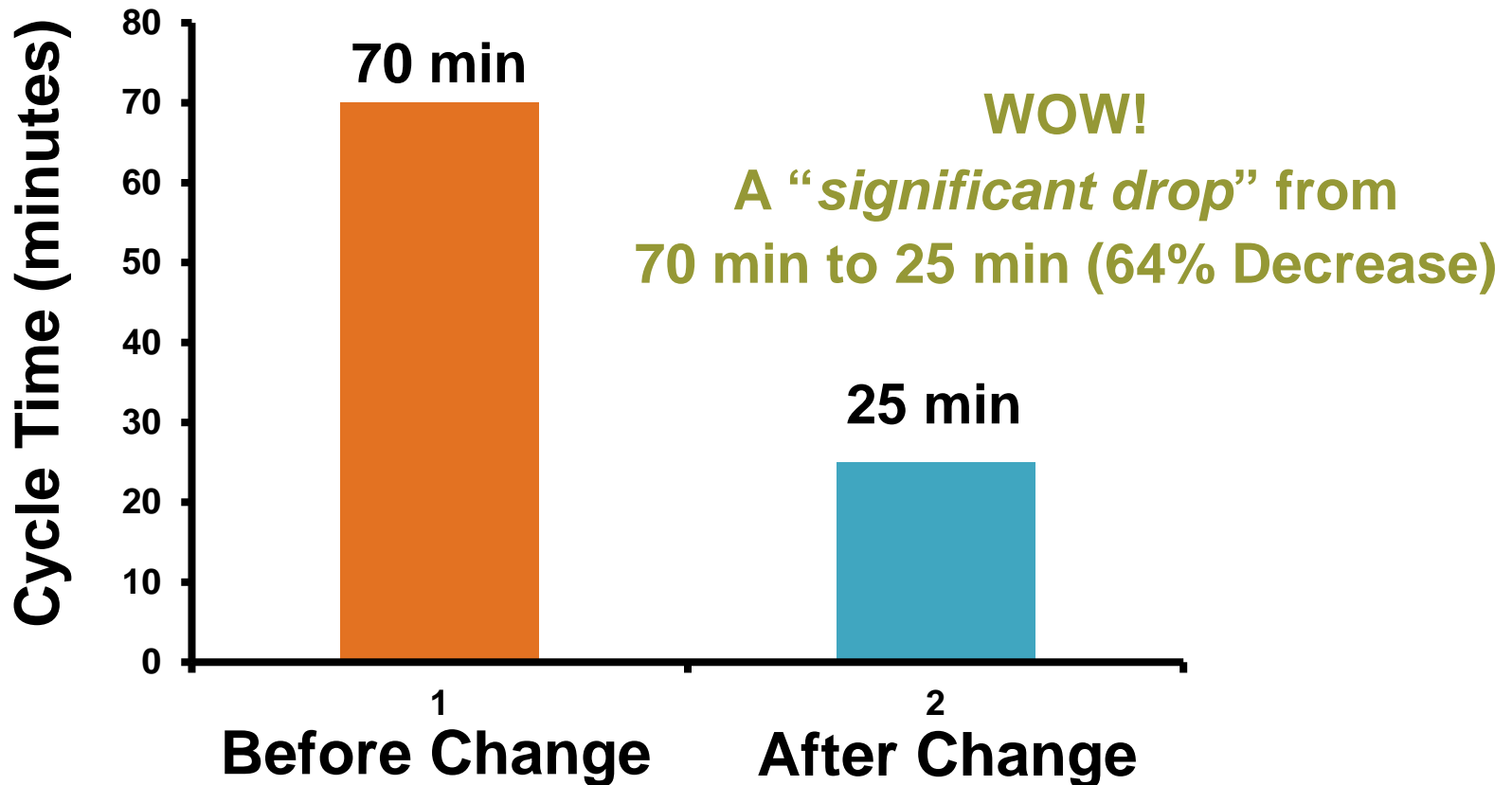
- ❖ Can mask behavior of the process
- ❖ May lead us to make incorrect decisions

Dynamic: Time Ordered

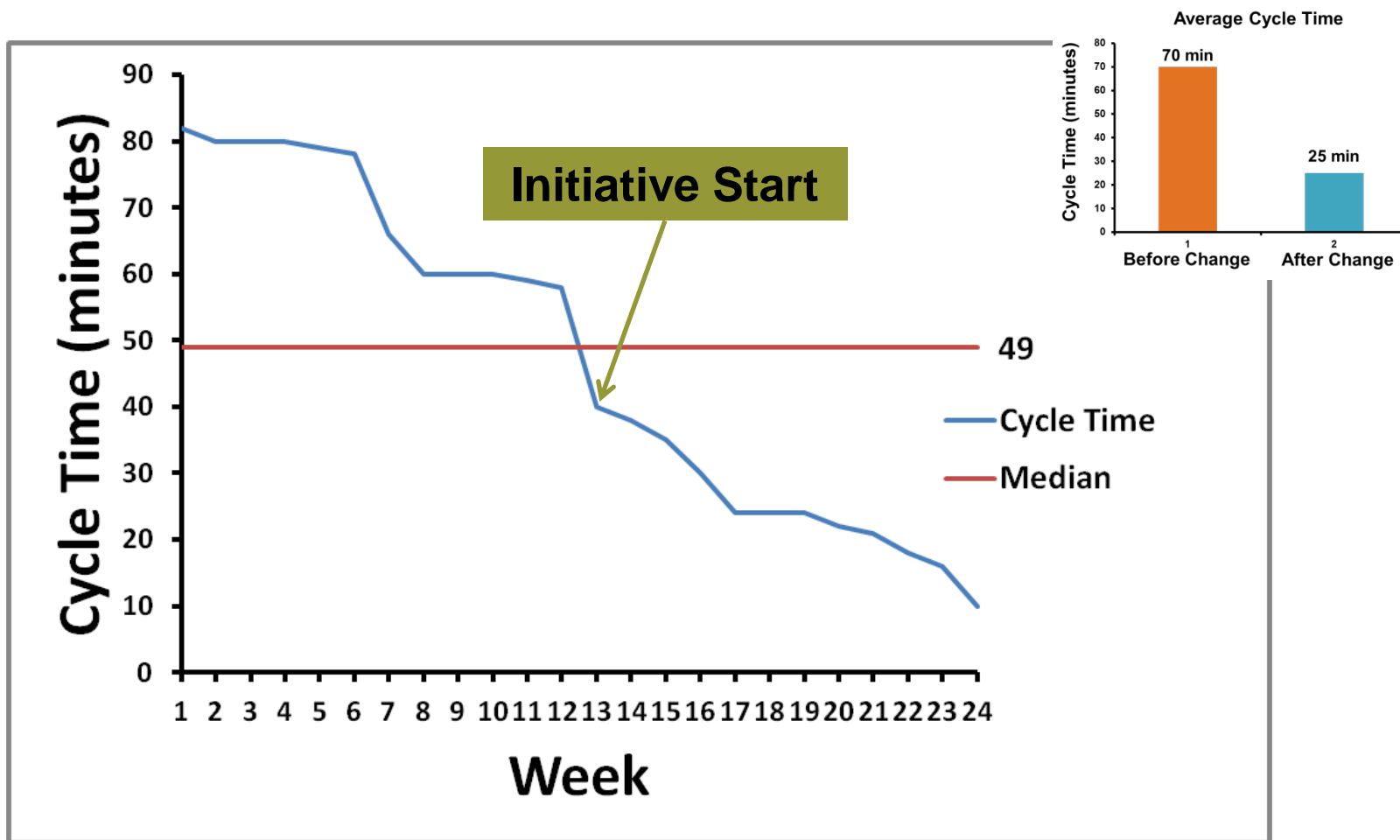
- ❖ Reveals behavior of the process
- ❖ Help us to make informed decisions more quickly

Static View

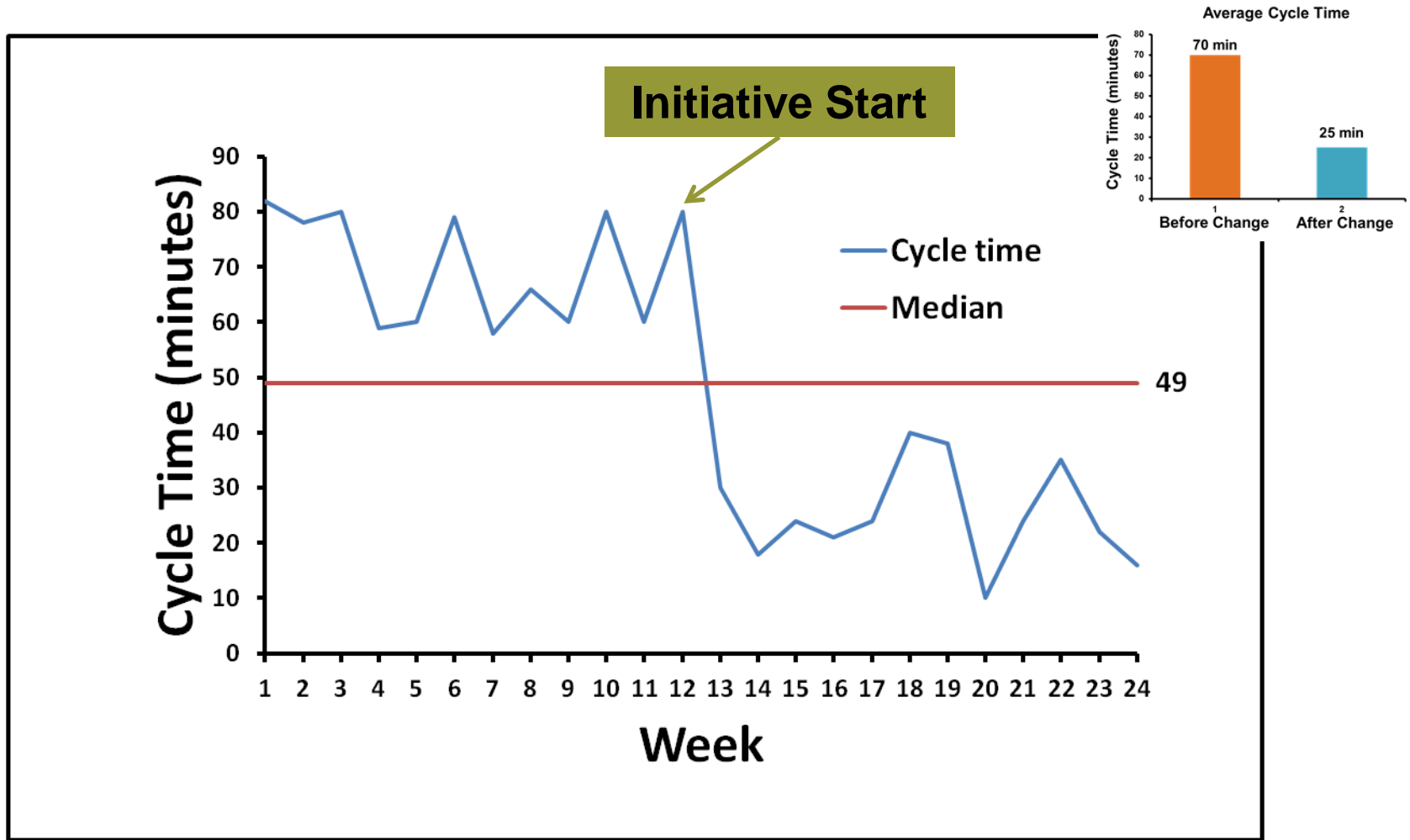
Average Cycle Time



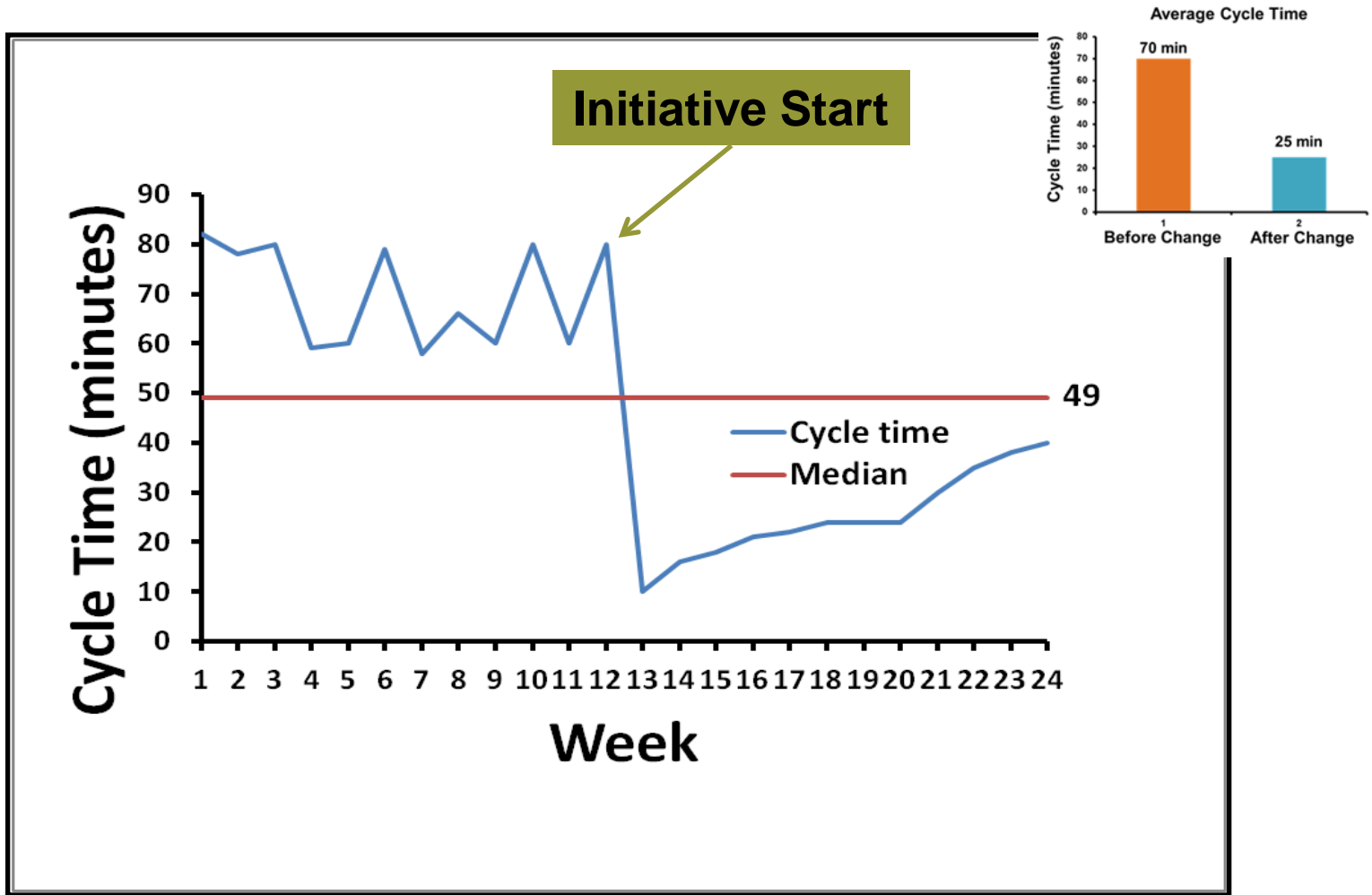
Dynamic View: Run Chart 1



Dynamic View: Run Chart 2



Dynamic View: Run Chart 3



Selected References

1. Benneyan JC, Lloyd RC, Plsek PE. Statistical process control as a tool for research and healthcare improvement. *Qual Saf Health Care*. 2003; 12: 458-464.
2. Perla RJ, Provost LP, Murray SK. The run chart: A simple analytical tool for learning from variation in healthcare processes. *BMJ Qual Saf* ; 2011; 20: 46-51.

Questions?

Contact information:

Linda W. Higgins, PhD, RN

412-268-0813

higglw@upmc.edu

Or

Kate Brownlee, MPM

412-647-5737

brownleek2@upmc.edu

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