HRET HIIN OFFICE HOURS
Using and Analyzing Run Charts

April 4, 2018
Poll: Your Run Chart Experience!

- A. “What’s a Run Chart?”
- B. “I did one in the last five years”
- C. “I don’t do them often, but I know how to make them”
- D. “I make them regularly to support the measures I’m collecting data on”
Poll: What are you hoping to learn today about run charts?

- A. How to make a run chart in excel
- B. What makes a run chart a run chart? Why run chart?
- C. More on the run chart rules for identifying special causes—telling me if the changes I’m making are leading to improvement
- D. Others? Live Chat...
Question #2 of the Model for Improvement

How will we know a change is an improvement?

Question #2 of the Model for Improvement

Five Steps:
1. Define your measures
2. Develop a data collection plan
3. Go out and collect it!
4. You have the data, so now what?
5. Let’s look at it… but how?

Elements of a Run Chart

The Centerline on a Run Chart is the Median

Simple run rules are used to determine if special cause variation is present
What is a Run Chart?

• A line graph of data plotted over time
• Data is kept in time order
  – 8-10 data points needed to get started (10-12 ideal)
• Can see the “story”
• Helps answer questions:
  – How much variation do we have? Is process changing meaningfully over time?
  – Has our change resulted in an improvement?
  – Did I hold the improvement?
• Uses the median as a central tendency
• Control charts indicate special cause and common cause variation BUT you can see signals in run charts using run chart rules—determine if random or non-random!

Adapted from Sue Butts Dion
Understanding Variation
“If I had to reduce my message for management to just a few words, I’d say it all had to do with reducing variation.”

W. Edwards Deming

(while many think solely about moving the average)
Variation

• What is variation?
  – The act, process or result of varying
  – The extent or degree to which something varies

• synonyms:
  – difference
  – disparity
  – dissimilarity
5 Stick People!
Change Hands!!
Variation

• What is variation?
  – The act, process or result of varying
  – The extent or degree to which something varies

• synonyms:
  – difference
  – disparity
  – dissimilarity
## Types of Variation

### Random Variation
- Is inherent in the design of the process
- Is due to regular, natural or ordinary causes
- Affects all the outcomes of a process
- Results in a “stable” process that is predictable
- Also known as random or unassignable variation

### Non-Random Variation
- Is due to irregular or unnatural causes that are not inherent in the design of the process
- Affect some, but not necessarily all aspects of the process
- Results in an “unstable” process that is not predictable
- Also known as non-random or assignable variation
What do these types of variation look like?

- Random Variation
- Non-Random Variation
How Do I Determine if My Change Is Leading to Improvement?

The Run Chart rules that help you decide if your data reflect common cause (random) or special cause (non-random) variation.

...If we are looking to see if our changes led to improvement, we are looking for what type of variation?

Special Cause/Non-Random

American Hospital Association
Rules to Identify Non-Random Patterns  
(in the Data Displayed on a Run Chart)

1. **A shift** in the process: 6 or more consecutive points above or below the median

2. **A trend** in the process: 5 or more consecutive points all increasing or decreasing

3. **An “astronomical” data point**
Examples of Three Run Chart Rules

A Shift: 6 or more

A Trend: 5 or more

An astronomical data point
1. What makes a good run chart?
2. Why do we use the median line?
3. Why do we look at data over time?
4. Why is it important to understand the normal variation in our system?
5. Should we wait to test ideas if our current system isn’t stable?
Examples from Fellows
EXCESSIVE ANTICOAGULATION WITH WARFARIN - INPATIENTS

Baseline Data and Goal - 0 patients

Month/Year
Jun-17 Jul-17 Aug-17 Sep-17 Oct-17 Nov-17 Dec-17 Jan-18

Percentage of inpatients received excessive anticoagulation with Warfarin
0 0 0 0 0 13.33 33.33 40