The Elliot

A Member of SOLUTIONHEALTH

Making Measurement Meaningful

September 22, 2023

New Hampshire Infection Control & Epidemiology Professional Group (NHICEP)

Revision Date: 09.15.2023

Who are we?

Hannah Rudolph

Continuous Improvement Specialist

Elliot Health System

Meagan Smart

Sr. Continuous Improvement Specialist

Elliot Health System

106,000 + covered lives

4,000 + caregivers

4 C.I. Specialists

296 hospital beds

2015 lean journey

Introduction to Mentimeter

Interactive presentation software.

Boosts learning and outcomes

Lets log in

Instructions

Go to

www.menti.com

Enter the code

4839 0176

ICE BREAKER

Learning Objectives

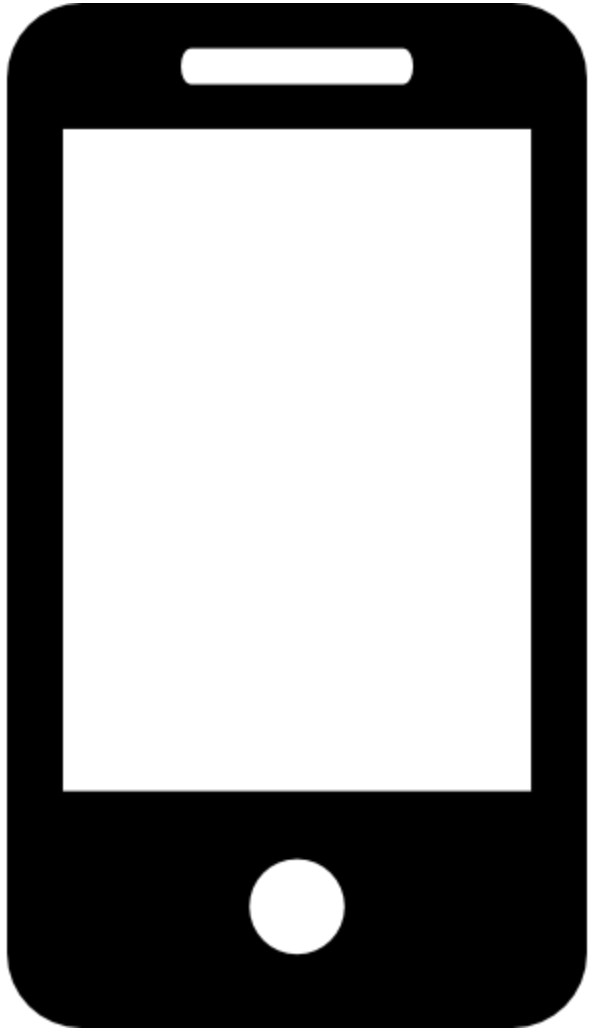
1. Understand the importance of using data to drive improvement
2. Define the types of quality measures
    - Outcome
    - Process
    - Balance
3. Introduce the quantitative tools that can be used for displaying and analyzing data
    - Run Charts
    - Pareto Charts

Mentimeter Poll

Assessing Comfort Data

Polling the Audience: What is your current comfort level with collecting, analyzing and visualizing data?

- Exceptional
- Pretty good
- Some what
- Uncomfortable
- Anything but data!



Types of Measures

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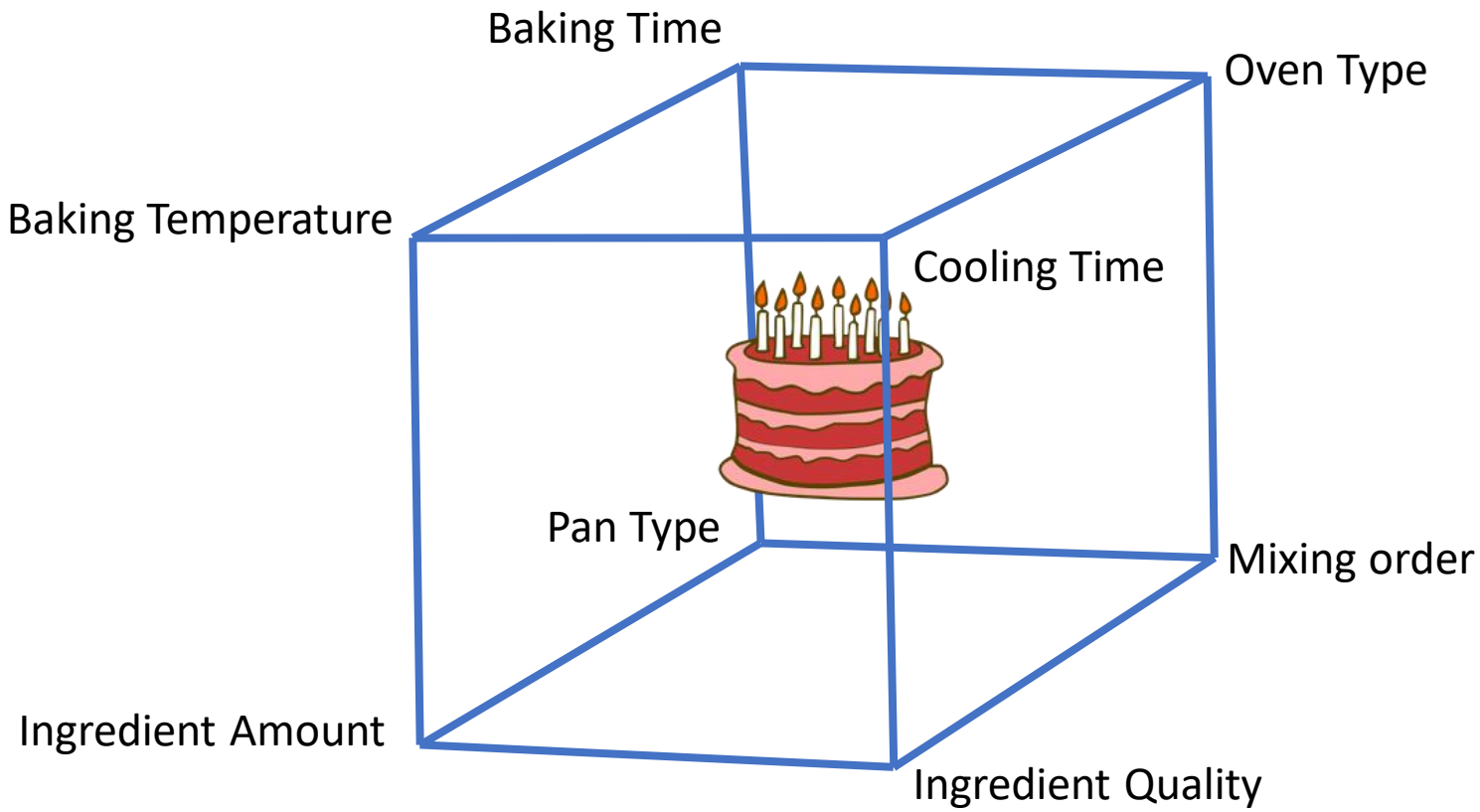
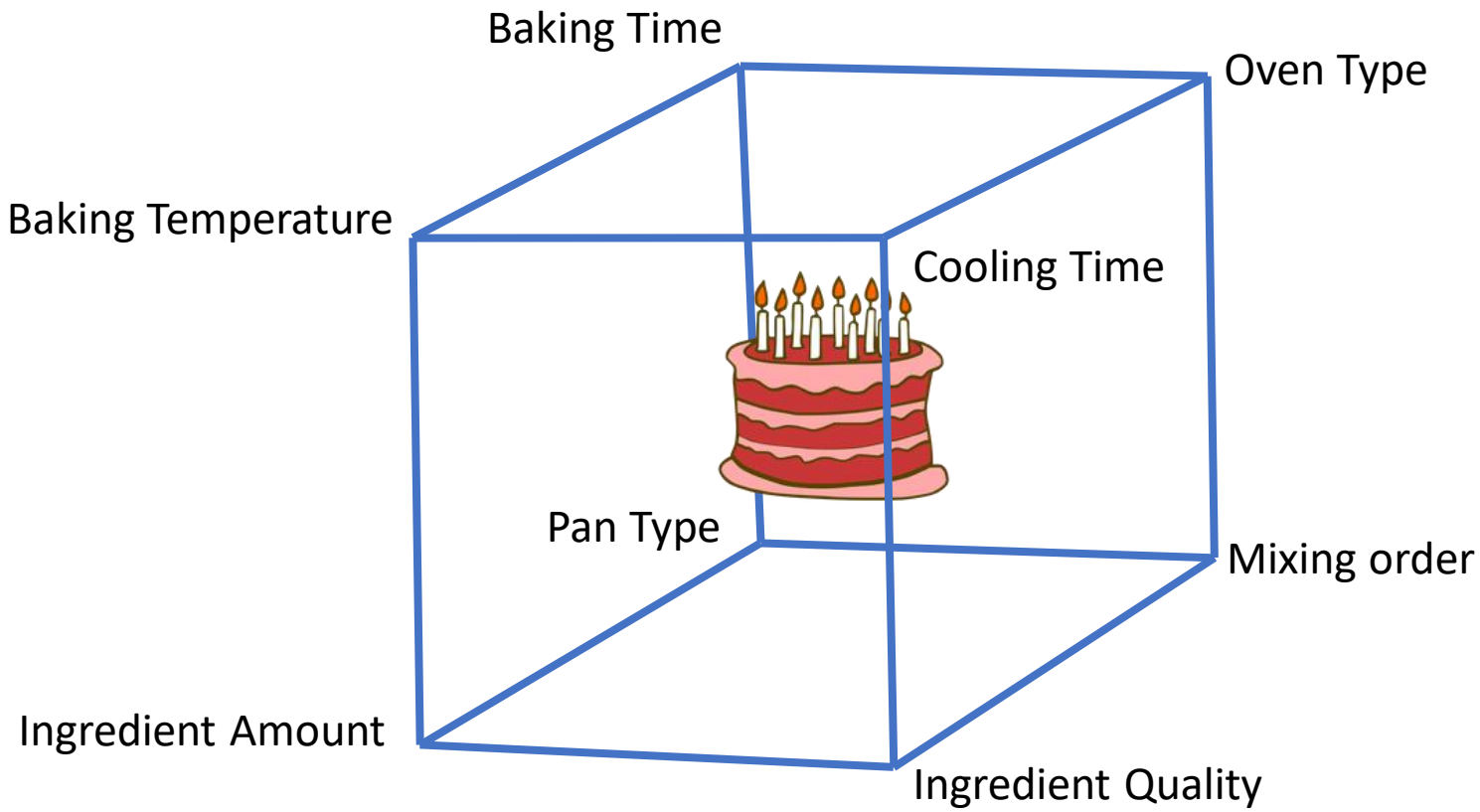
Measure	Definition	Characteristics
Outcome	Reflects how well the **steps** in the system impact a particular outcome metric (maintained internally).	▪ Reflects the aim of the project ▪ Voice of the customer ▪ Often a lag in reporting
Process	Reflects how well the **steps** in the system impact a particular outcome metric (maintained internally).	▪ Easy to collect ▪ Reflects process capability ▪ Helps keeps improvement project on track

Source: *The Improvement Guide*

Outcome Measures vs. Process Measures



Outcome Measures vs. Process Measures



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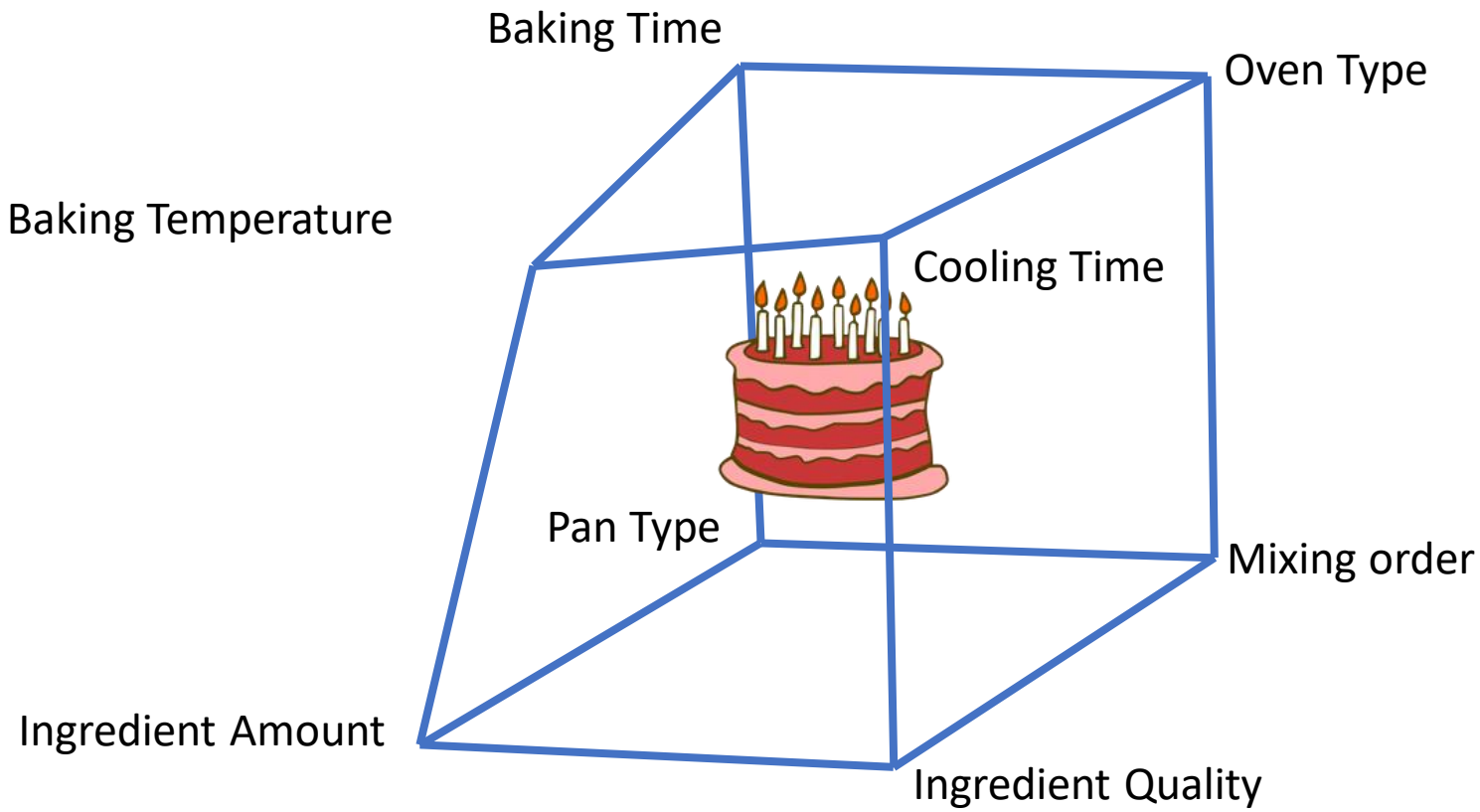
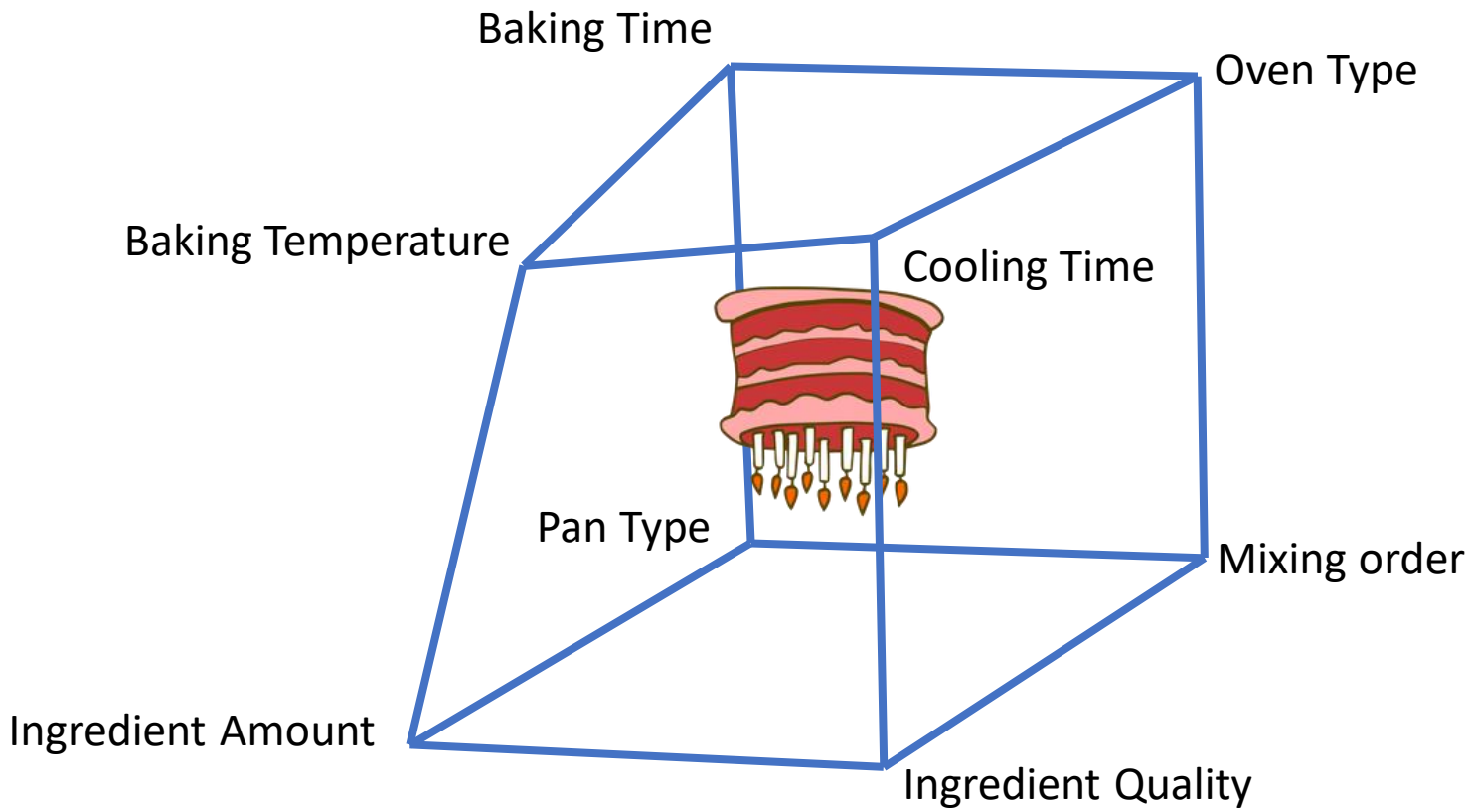


Outcome Measures vs. Process Measures

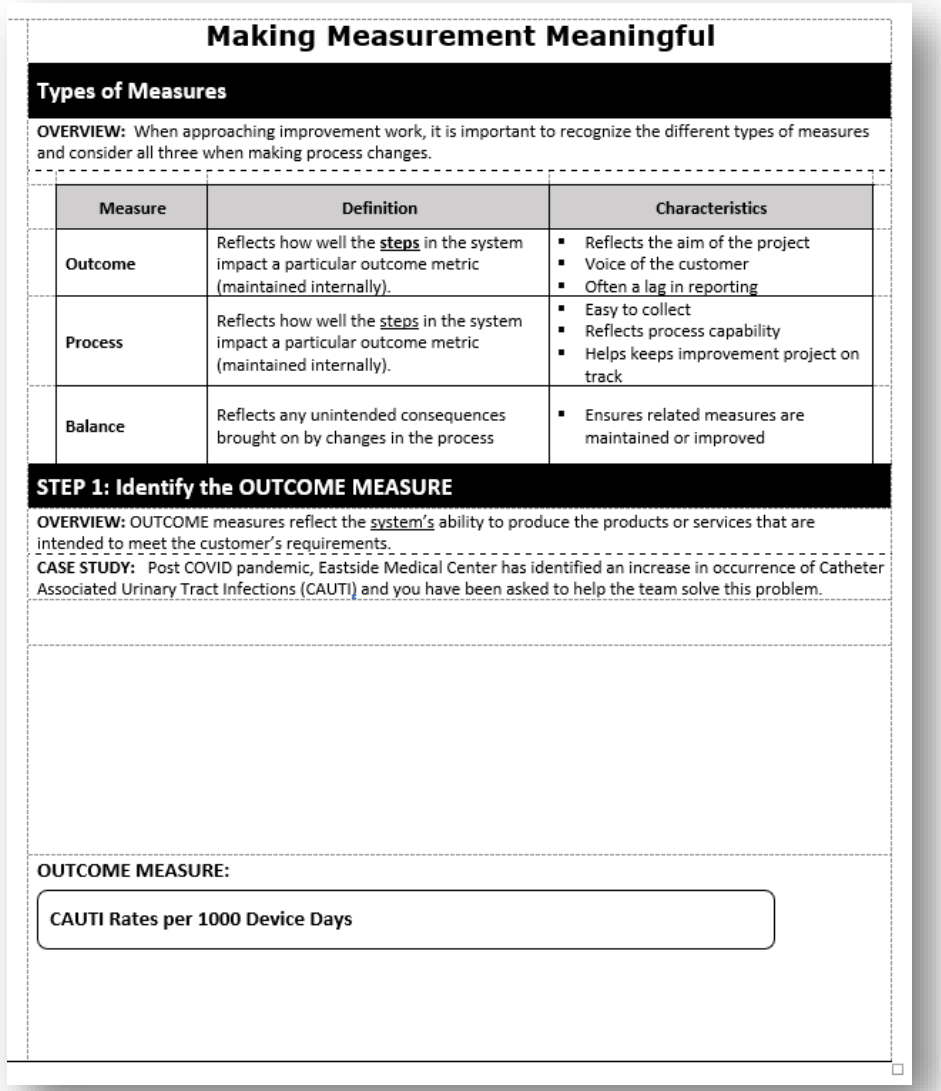


Case Study

Eastside Medical Center

Post-COVID pandemic, Eastside Medical Center has been under significant staffing constraints but is finally regaining normalcy. With improved staffing levels, the nursing leadership team determined it was an appropriate time to launch new improvement work. The leadership team reviewed several HARM metrics and noted an increase in the occurrence of Catheter-Associated Urinary Tract Infections (CAUTI) from the past year.

The national benchmark for performance is 1.00. With the number of CAUTI events increasing and over the benchmark, the nursing team organized an interdisciplinary team to investigate the problem in more detail and hopefully determine the root cause.



Making Measurement Meaningful

Types of Measures

OVERVIEW: When approaching improvement work, it is important to recognize the different types of measures and consider all three when making process changes.

Measure	Definition	Characteristics
Outcome	Reflects how well the steps in the system impact a particular outcome metric (maintained internally).	▪ Reflects the aim of the project ▪ Voice of the customer ▪ Often a lag in reporting
Process	Reflects how well the steps in the system impact a particular outcome metric (maintained internally).	▪ Easy to collect ▪ Reflects process capability ▪ Helps keeps improvement project on track
Balance	Reflects any unintended consequences brought on by changes in the process	▪ Ensures related measures are maintained or improved

STEP 1: Identify the OUTCOME MEASURE

OVERVIEW: OUTCOME measures reflect the system's ability to produce the products or services that are intended to meet the customer's requirements.

CASE STUDY: Post COVID pandemic, Eastside Medical Center has identified an increase in occurrence of Catheter Associated Urinary Tract Infections (CAUTI) and you have been asked to help the team solve this problem.

OUTCOME MEASURE:

CAUTI Rates per 1000 Device Days

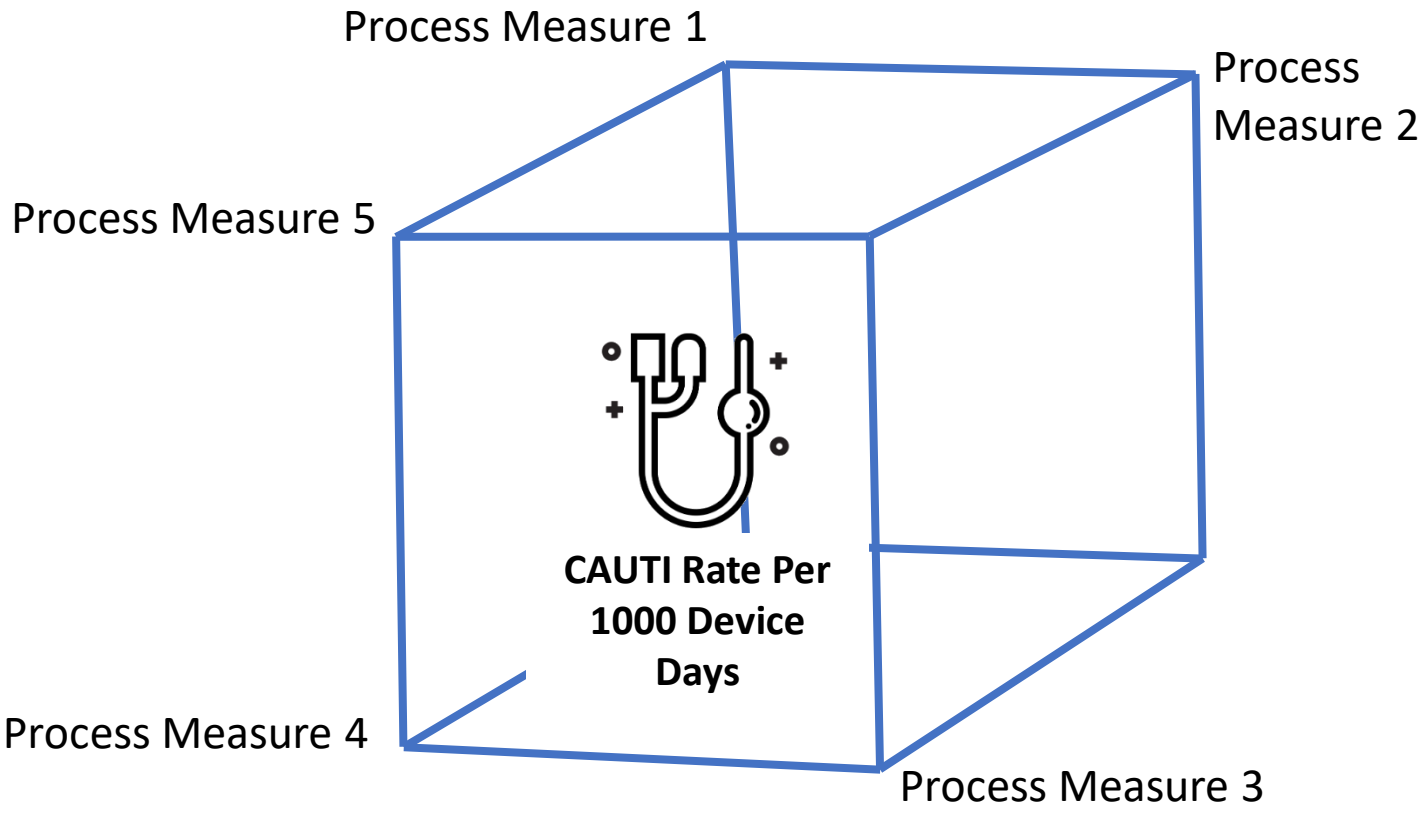
Worksheet Exercise: 3 Minutes

STEP 2: Converting Outcome Measures to Process Measures

What process steps have the biggest impact on CAUTI Prevention?

Consider how you might measure that?

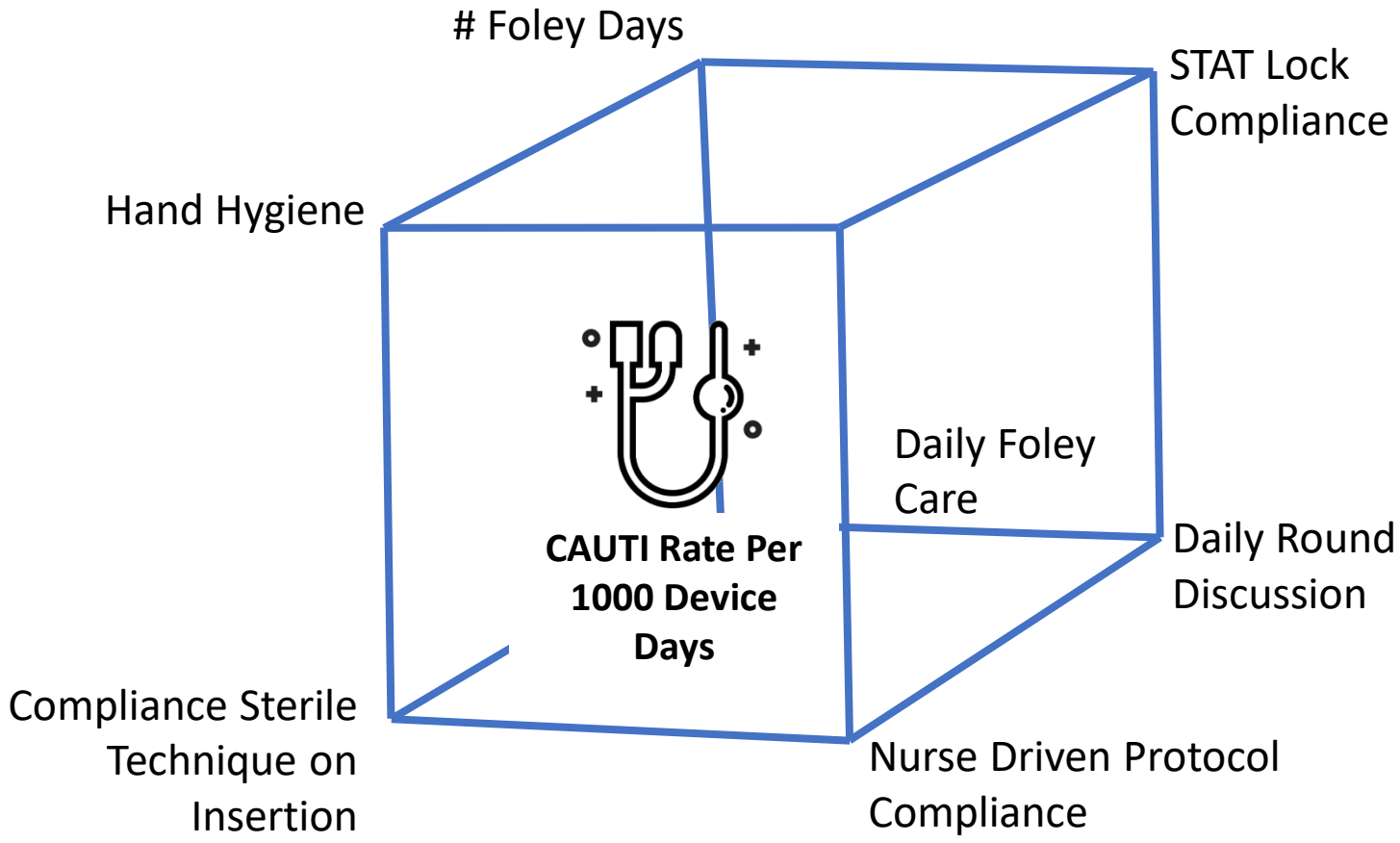
- # of occurrences
- % compliance



Group Discussion: 3 Minutes

STEP 2: Converting Outcome Measures to Process Measures

What process measures did you identify?



Types of Measures

Measure	Definition	Characteristics
Outcome	Reflects the impact that the **system** has on the status of the patient (often reported to government and commercial payers).	▪ Reflects the aim of the project ▪ Voice of the customer ▪ Often a lag in reporting
Process	Reflects how well the **steps** in the system impact a particular outcome metric (maintained internally).	▪ Easy to collect ▪ Reflects process capability ▪ Helps keeps improvement project on track
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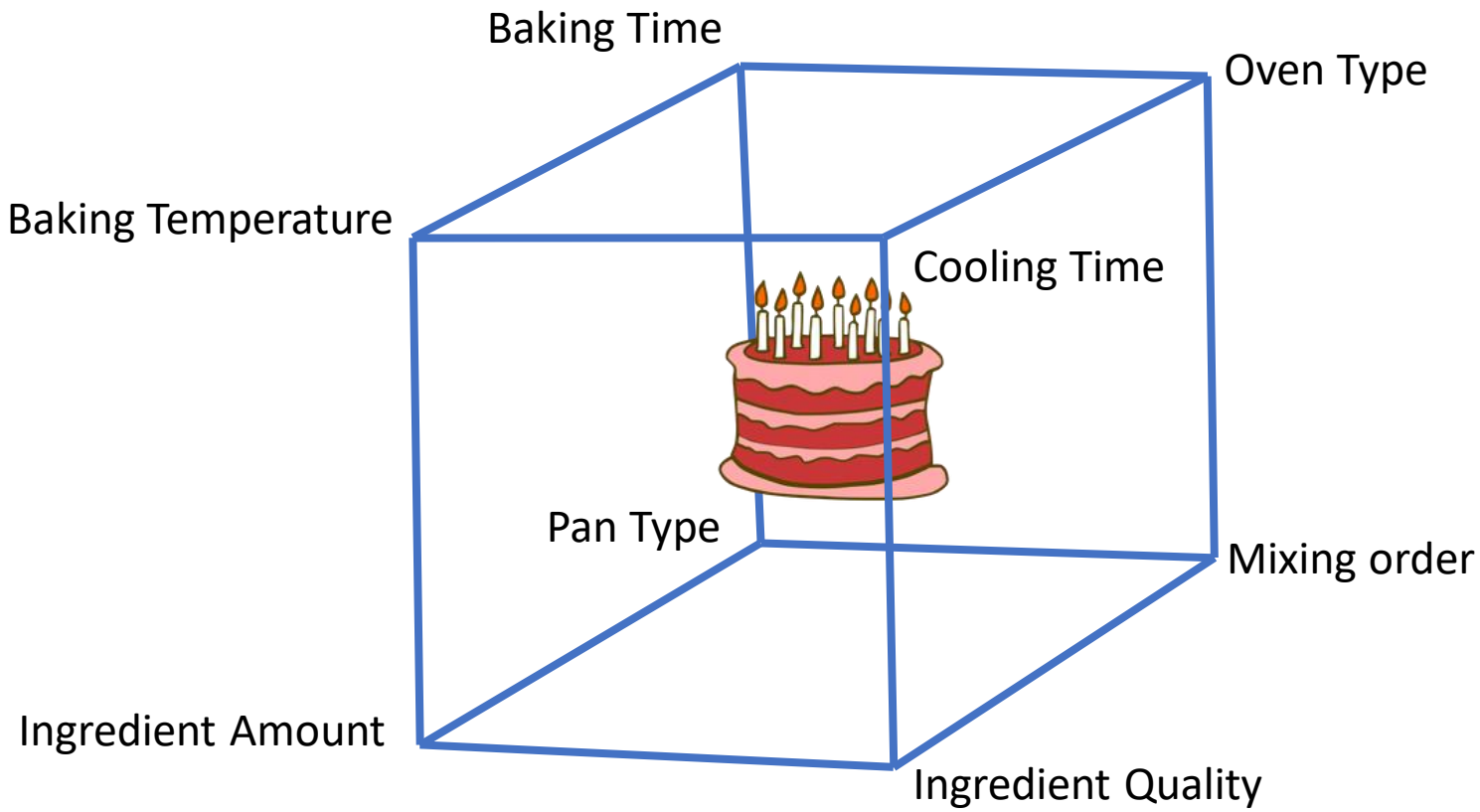
Source: *The Improvement Guide*

Process Measures vs Balance Measures



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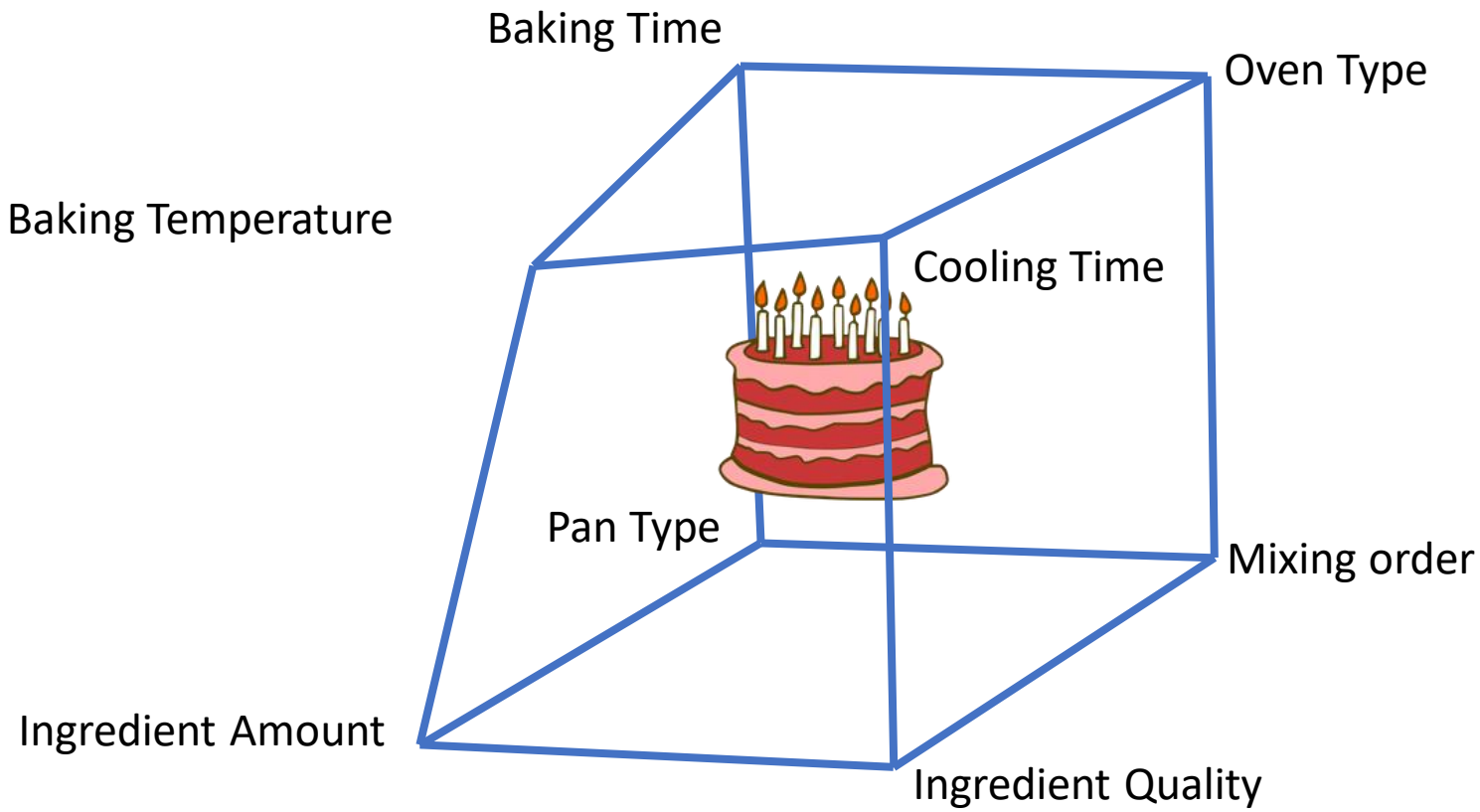

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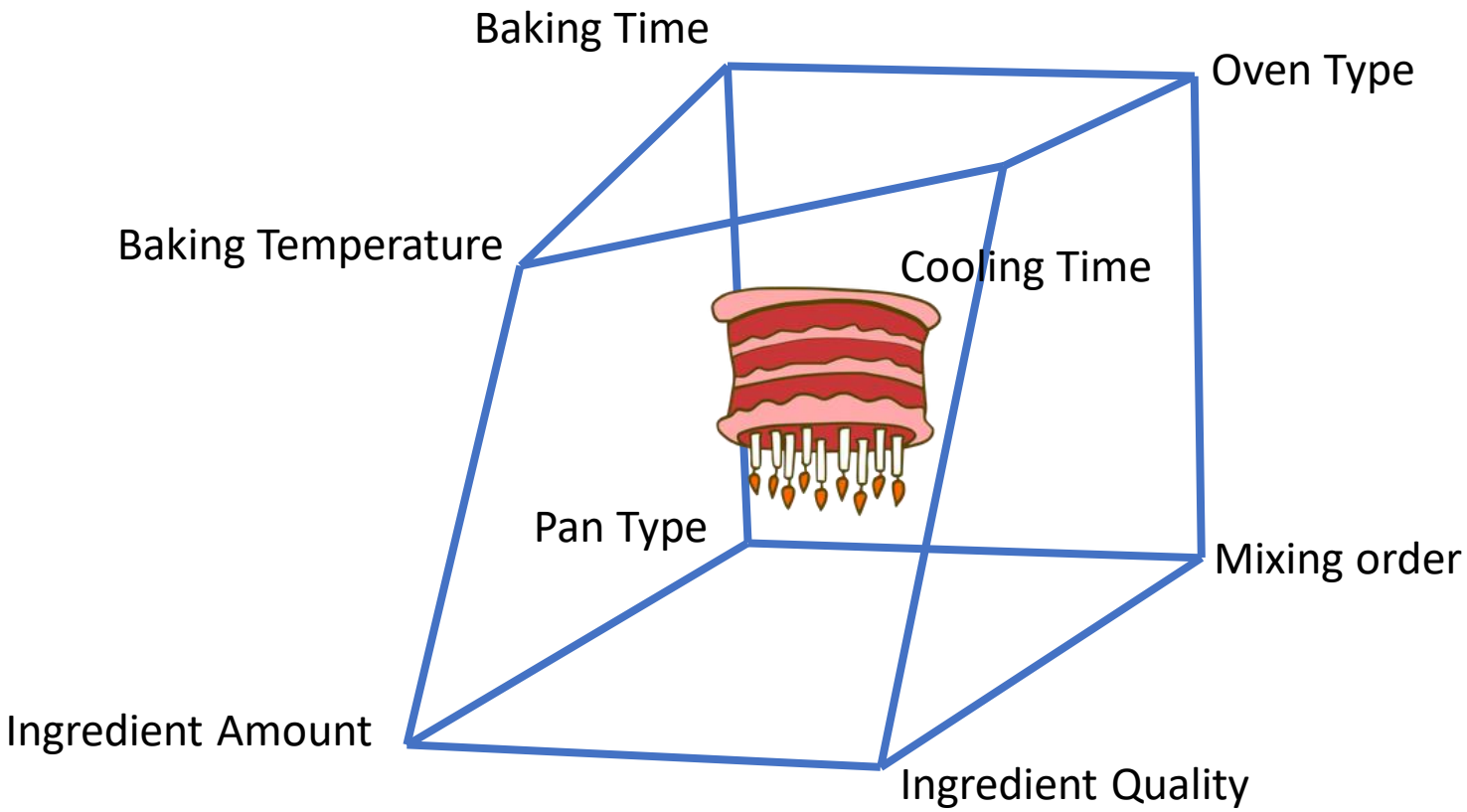


Worksheet Exercise: 2 Minutes

STEP 3: Identify your Balance Measures

Take a few minutes and brainstorm balance measures.

What other measures might you monitor during your improvement work to ensure there aren't any unintended consequences?

Worksheet Exercise: 2 Minutes

STEP 3: Identify your Balance Measures

Nurse Driven Protocols

# of Foley Days

STAT Lock Compliance

Daily Foley Care

Process Measures

# of Urine Cultures

Total Costs

Supplies

Nursing Time/Workload

Balance Measures

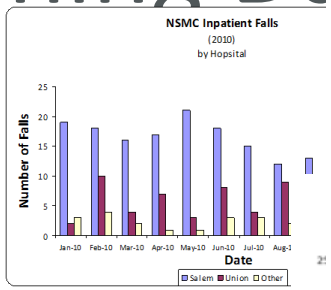
Chart Selection & Analysis

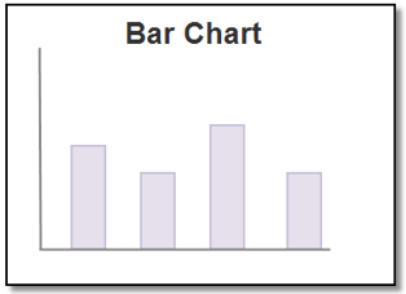
Purpose of a Chart (Graph)

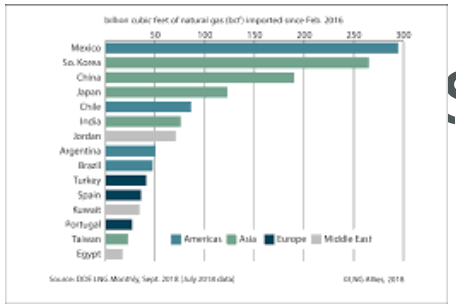
A chart (or graph) is a visual representation that converts raw data into useful information for managerial decision making; it can be used:

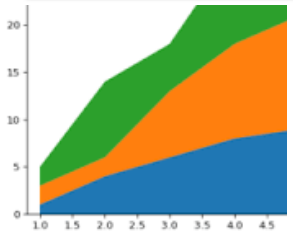
1. to **Compare**
2. to show the **Variation**
3. to show **Trends** over time
4. to explain **Parts of the Whole**
5. to understand the **Relationship**

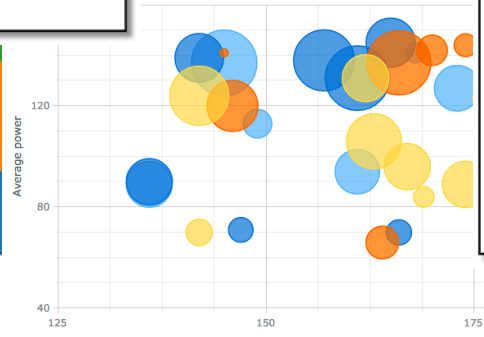
Graphing Data: Commonly s in QI

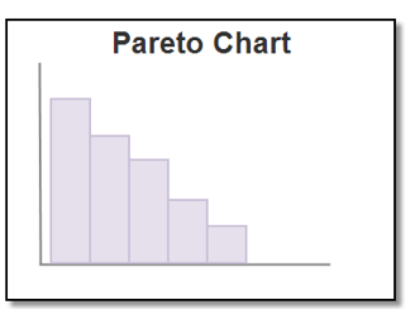


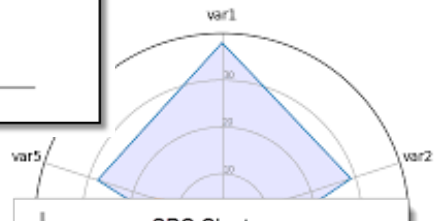


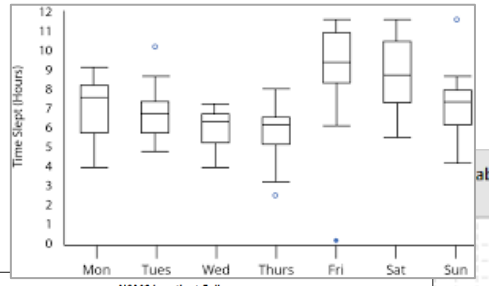


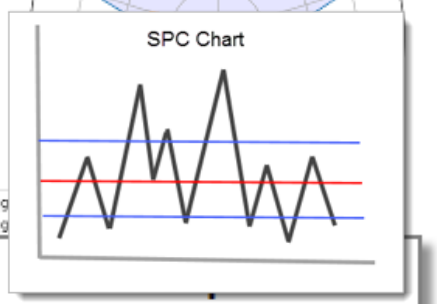


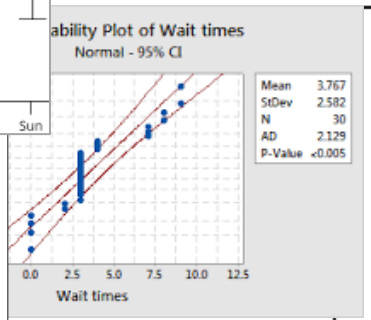


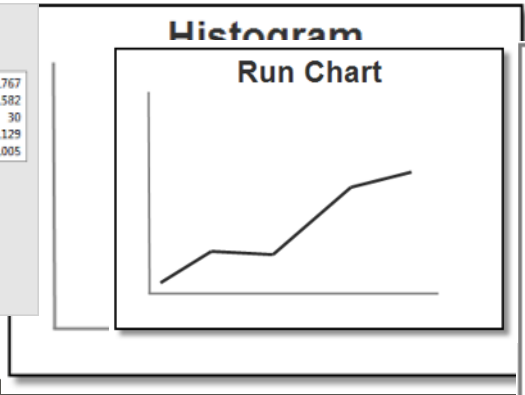


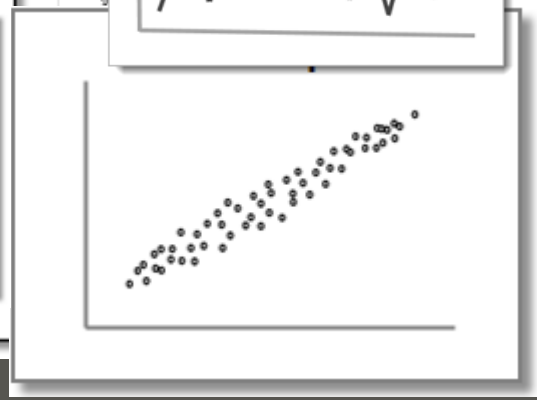


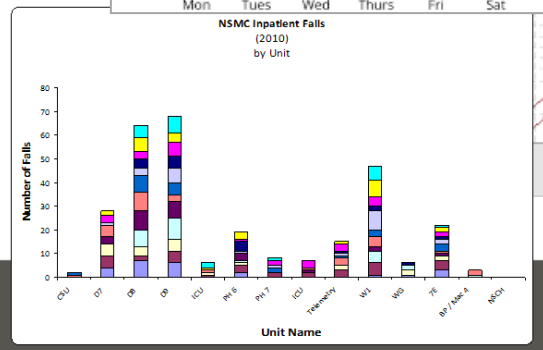












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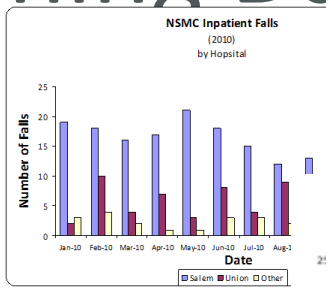
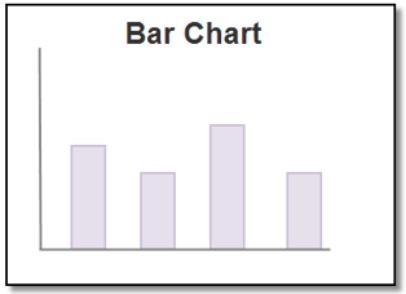
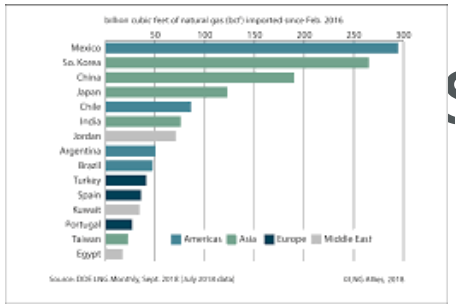
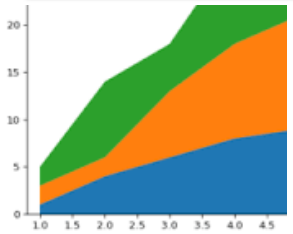
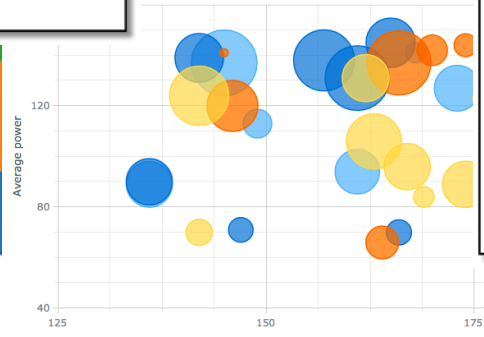
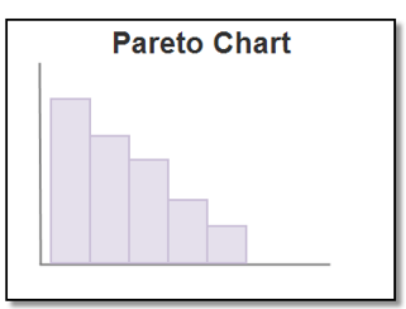


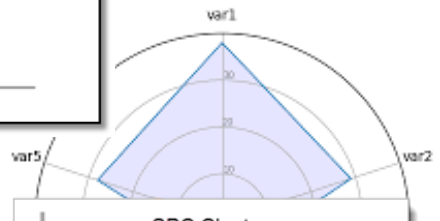


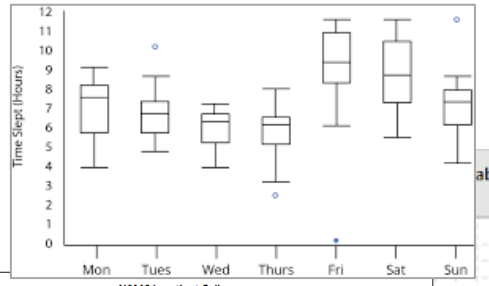


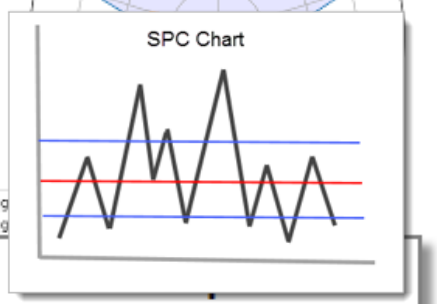


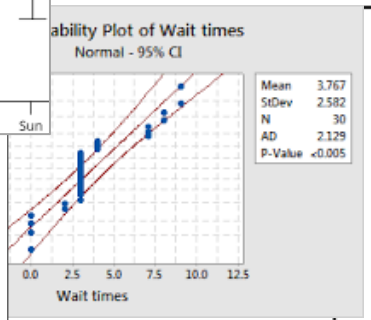


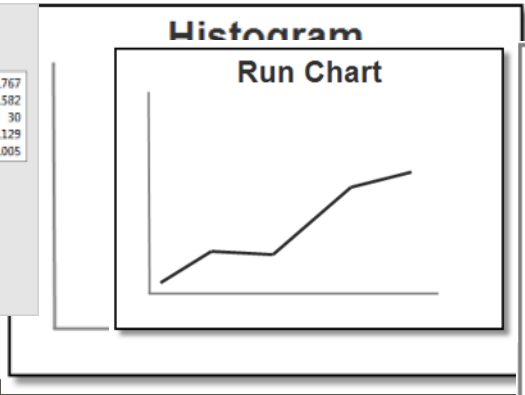


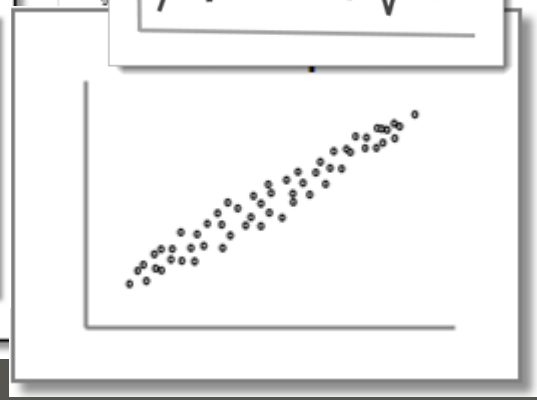


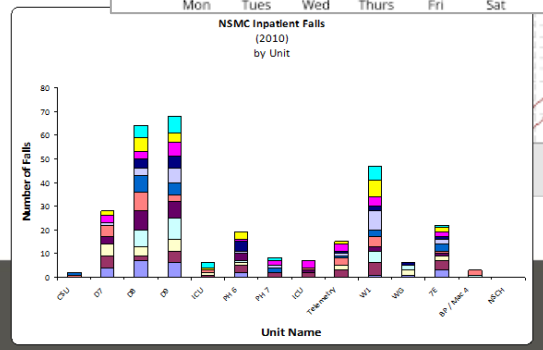




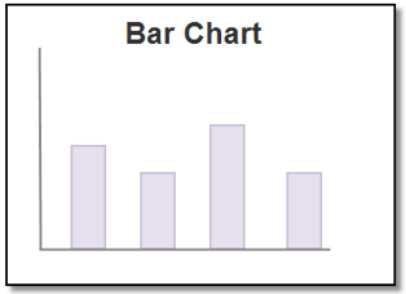


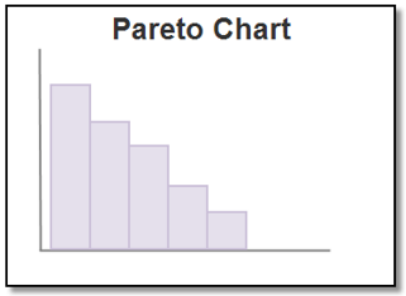


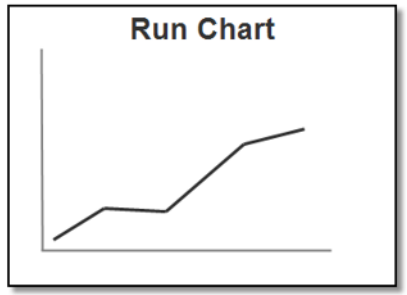




Graphing Data: Commonly used tools in QI







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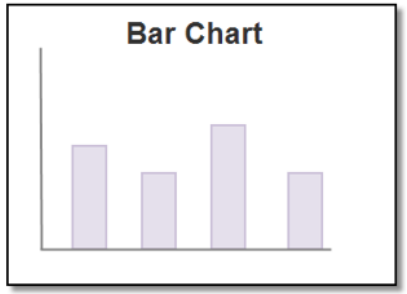

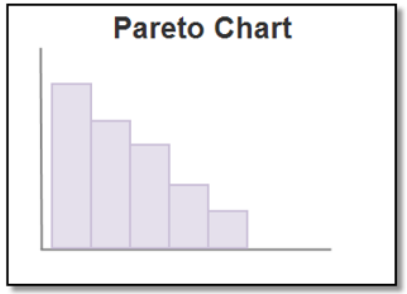

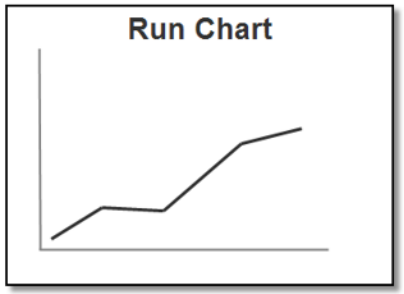

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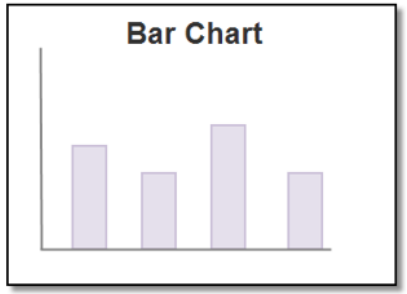
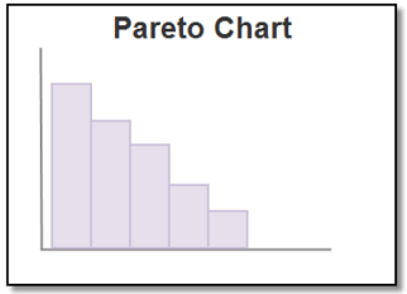
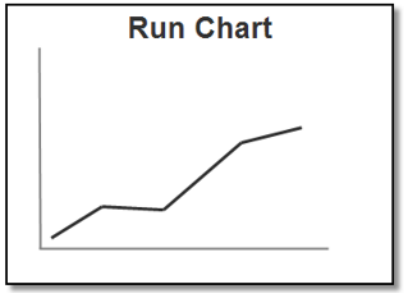
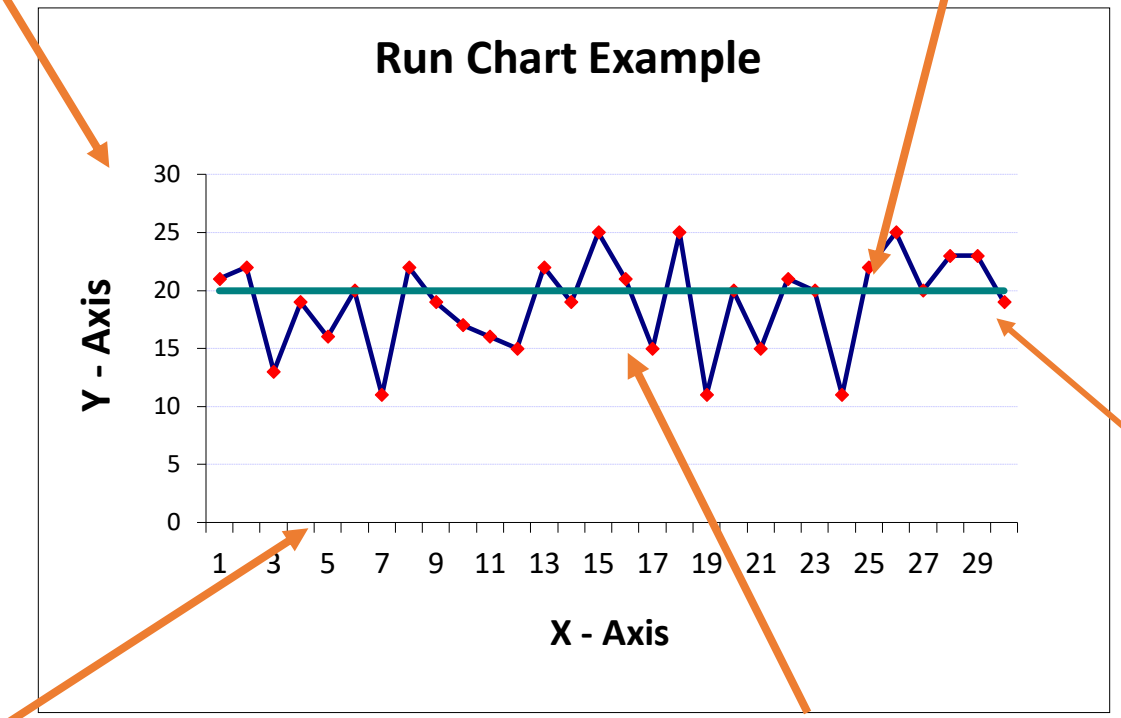
	**Comparing parts of the whole (in a non prioritized fashion)**	Used to identify the most frequent problems or causes of problems
	**Comparing parts of the whole (in a prioritized fashion)**	Used to identify prioritization
	**How data *behave* over time**	Shows trends or other patterns that occur over time

Run Charts – to show a trend over time

Run Chart Features

Vertical axis shows the numerical value or count

Data points plotted in time order



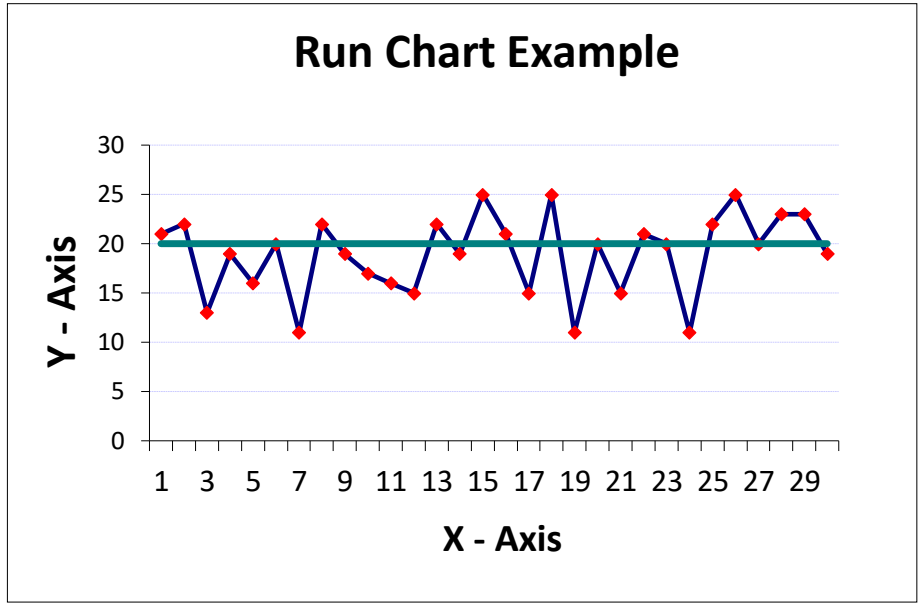
Data points "typically" centered around the MEDIAN

Horizontal axis indicates time

Points are connected by a line to aid in visual interpretation

Uses for Run Charts?

- Display data to make process performance visible
- Establish if a change resulted in improvement
- Monitor process changes for sustainment

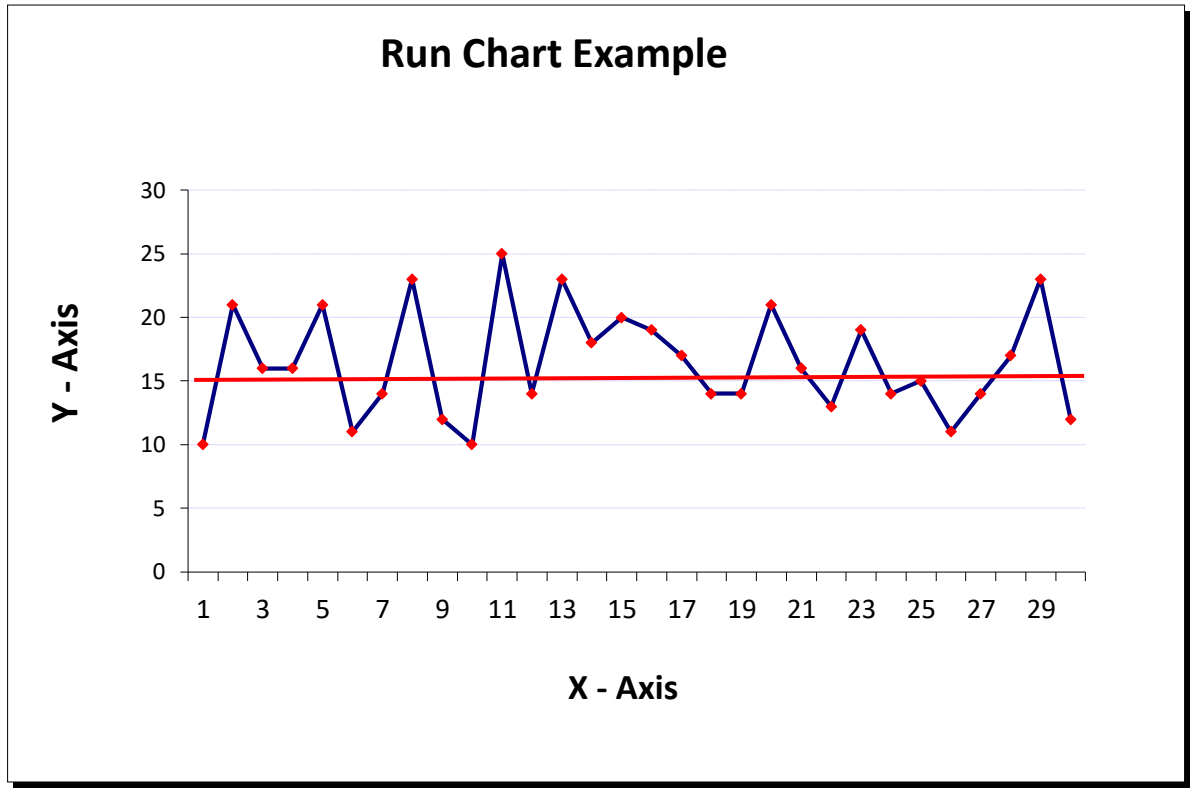


A run chart should include at least 10-15 data points before applying any of the run chart rules.

Analyzing Run Charts

Knowing the Median – helps to understand the types of variation

- Common Cause Variation:
  - Inherent/ Predictable to the process
  - Due to regular, natural changes
  - Controlled by managing the process
- Special Cause Variation:
  - Not inherent to the process
  - Due specific changes to the process
  - Controlled by managing the individual or moment



If you don’t understand variation…..

You might be tempted to:

- Deny the data (doesn’t fit my reality!)
- See trends where there are none
- Try to explain natural variation as special events
- Blame or give credit to people for things they have no control over
- Distort the process
- Kill the messenger!

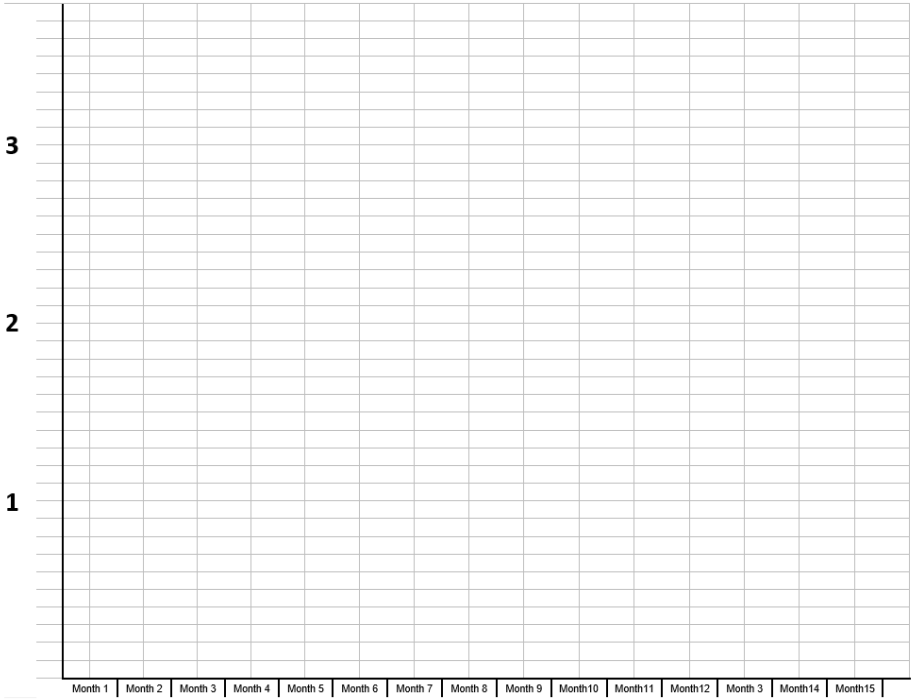
Worksheet Exercise: 3 Minutes

Step 4: Build your run chart

Using the baseline data provided, create a run chart.

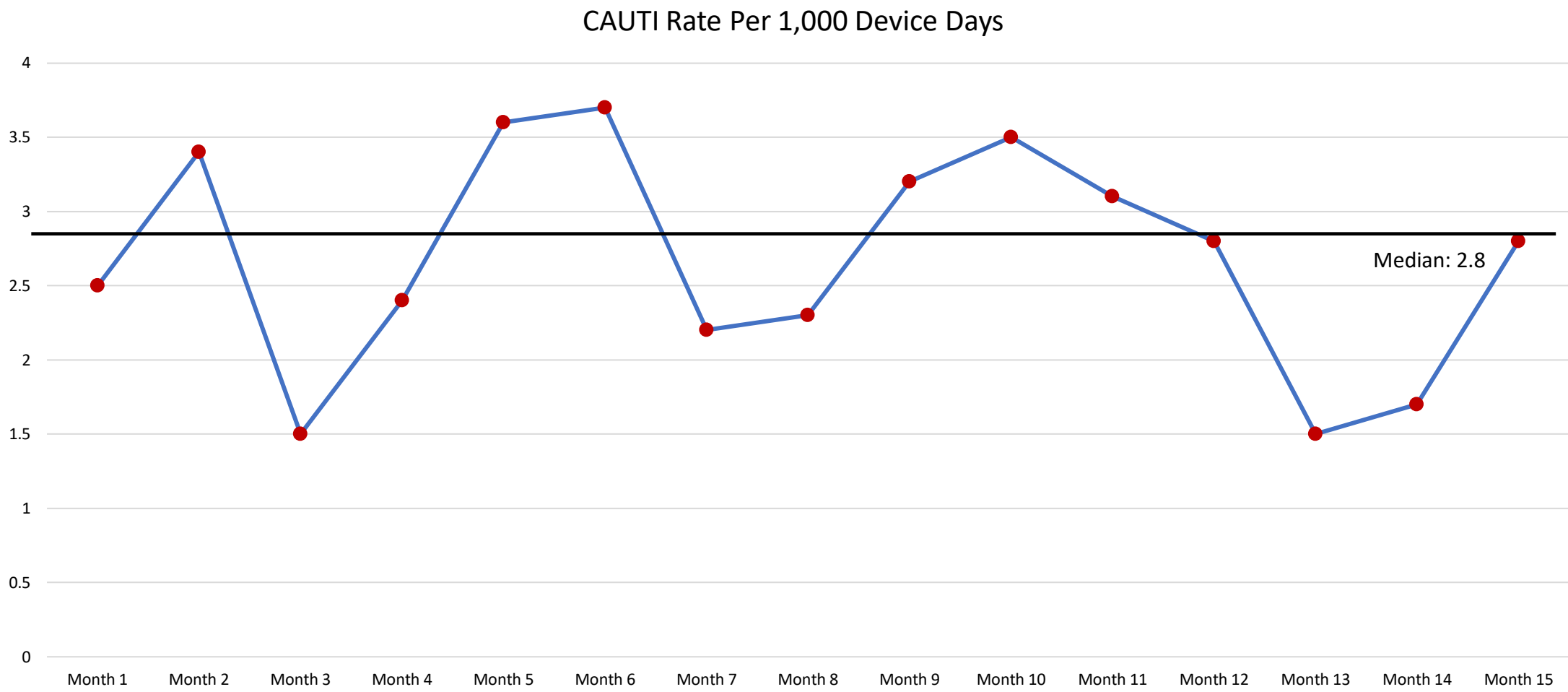
Be sure to add the Median ( ).

Month #	CAUTI Rate	Month #	CAUTI Rate	Month #	CAUTI Rate
Month 1	2.5	Month 6	3.7	Month 11	3.1
Month 2	3.4	Month 7	2.2	Month 12	2.8
Month 3	1.5	Month 8	2.3	Month 13	1.5
Month 4	2.4	Month 9	3.2	Month 14	1.7
Month 5	3.6	Month 10	3.5	Month 15	2.8



Worksheet Exercise: 3 Minutes

Step 4: Build your run chart

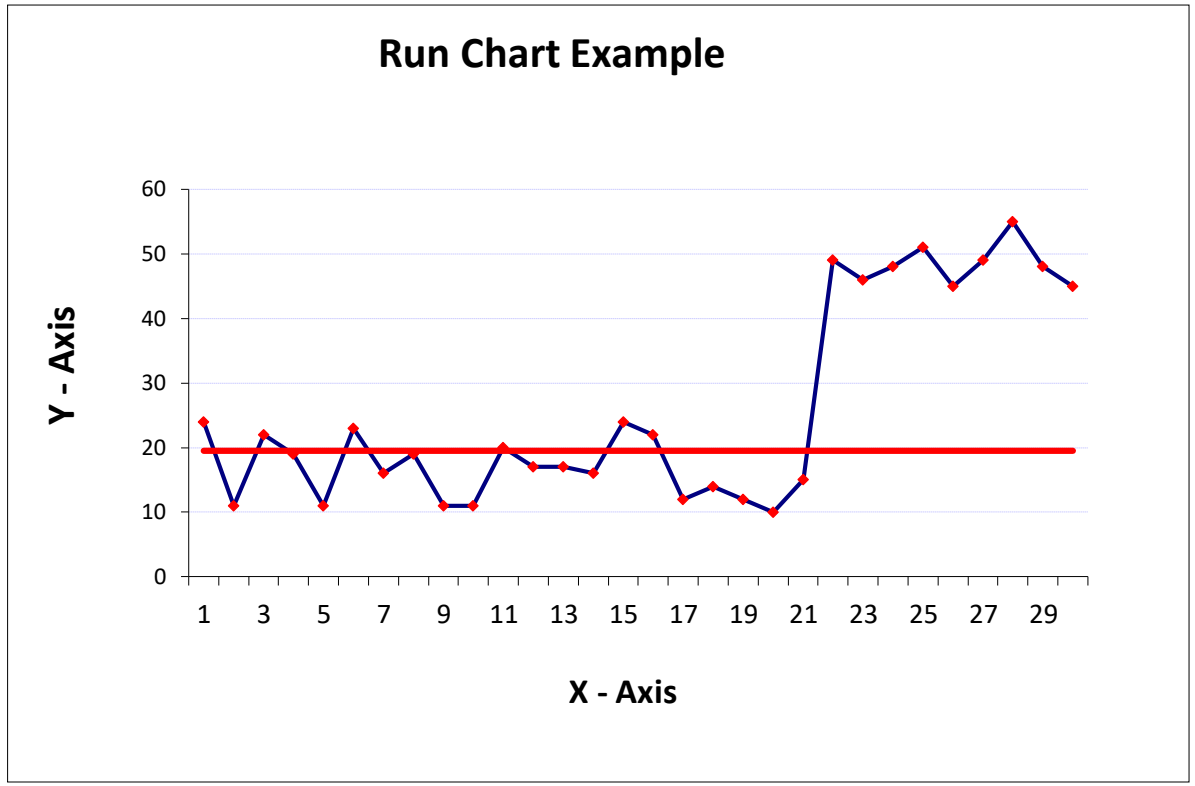


Analyzing Run Charts

Shifts

Six or more consecutive points all above or below the median.

- A process shift will generally occur quickly and as a result of a dramatic change in the process.
- This occurs when the **average** of the process has increased or decreased.

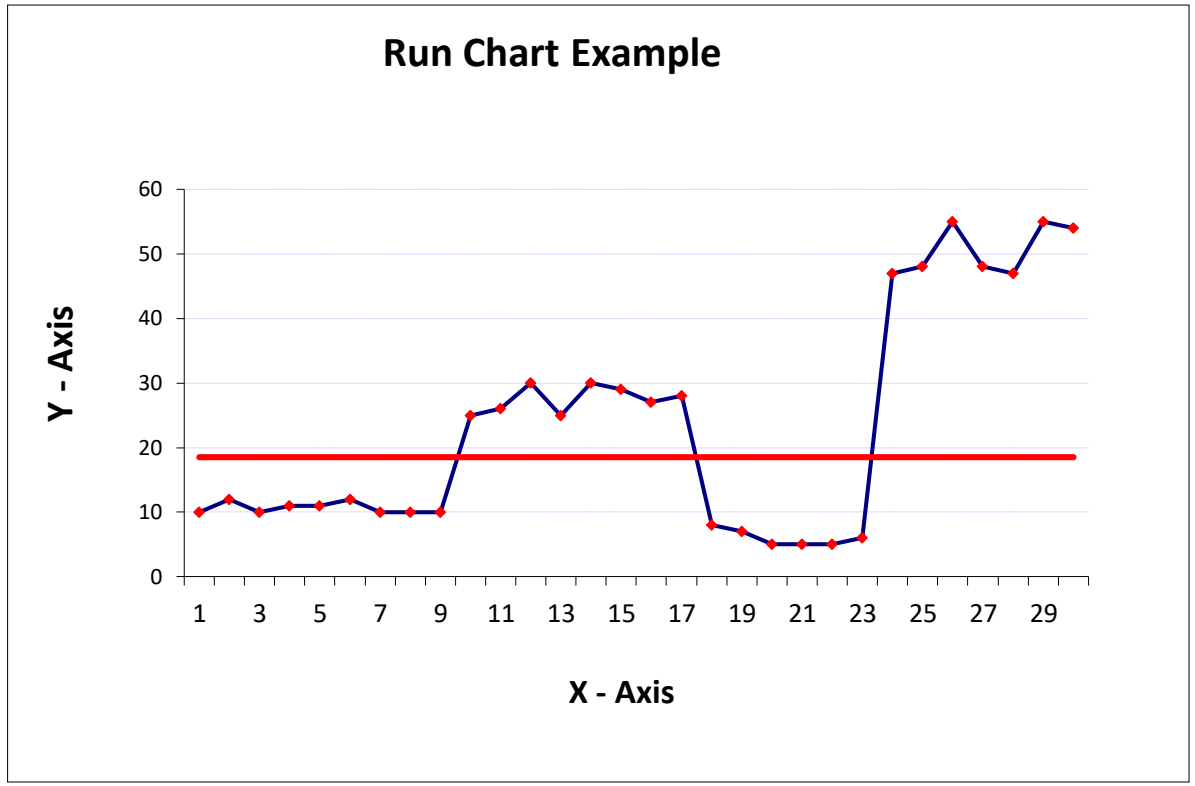


Analyzing Run Charts

Clusters

Groups of points on one side of the median or the other.

- This occurs when there is a **shift** in the process average or a cyclical pattern.

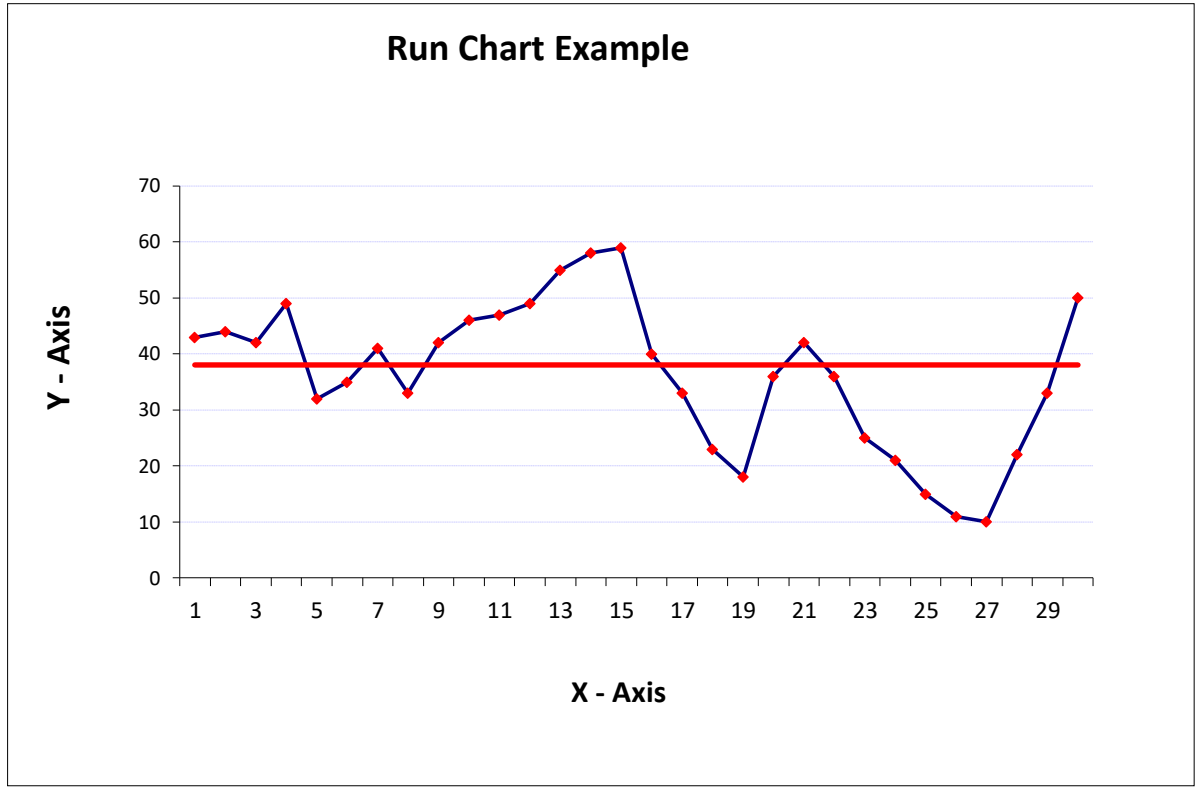


Analyzing Run Charts

Trends

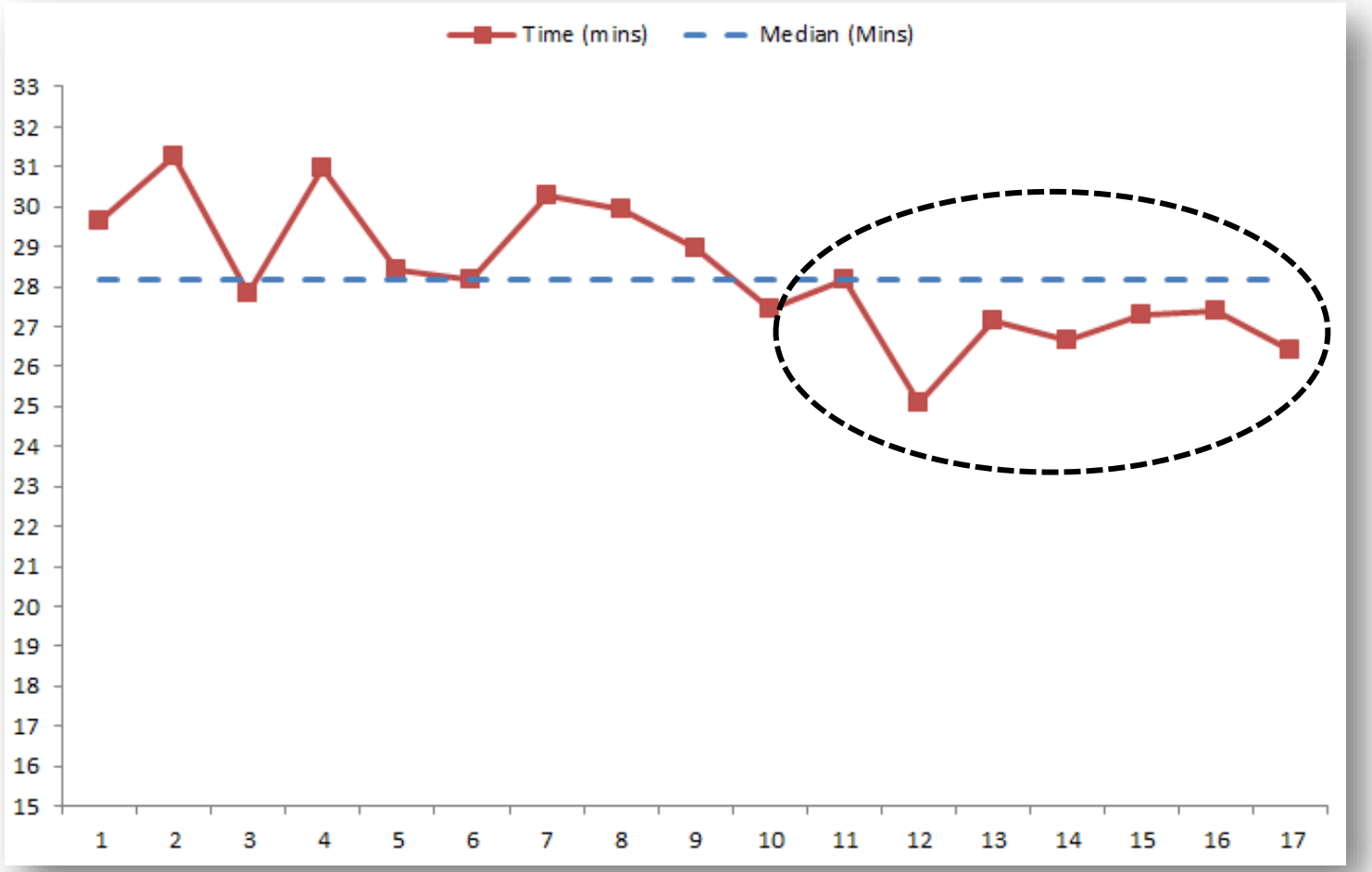
Six or more points in a row are decreasing or increasing.

- A trend is a series of changes that occur to processes over time.



Mentimeter Poll

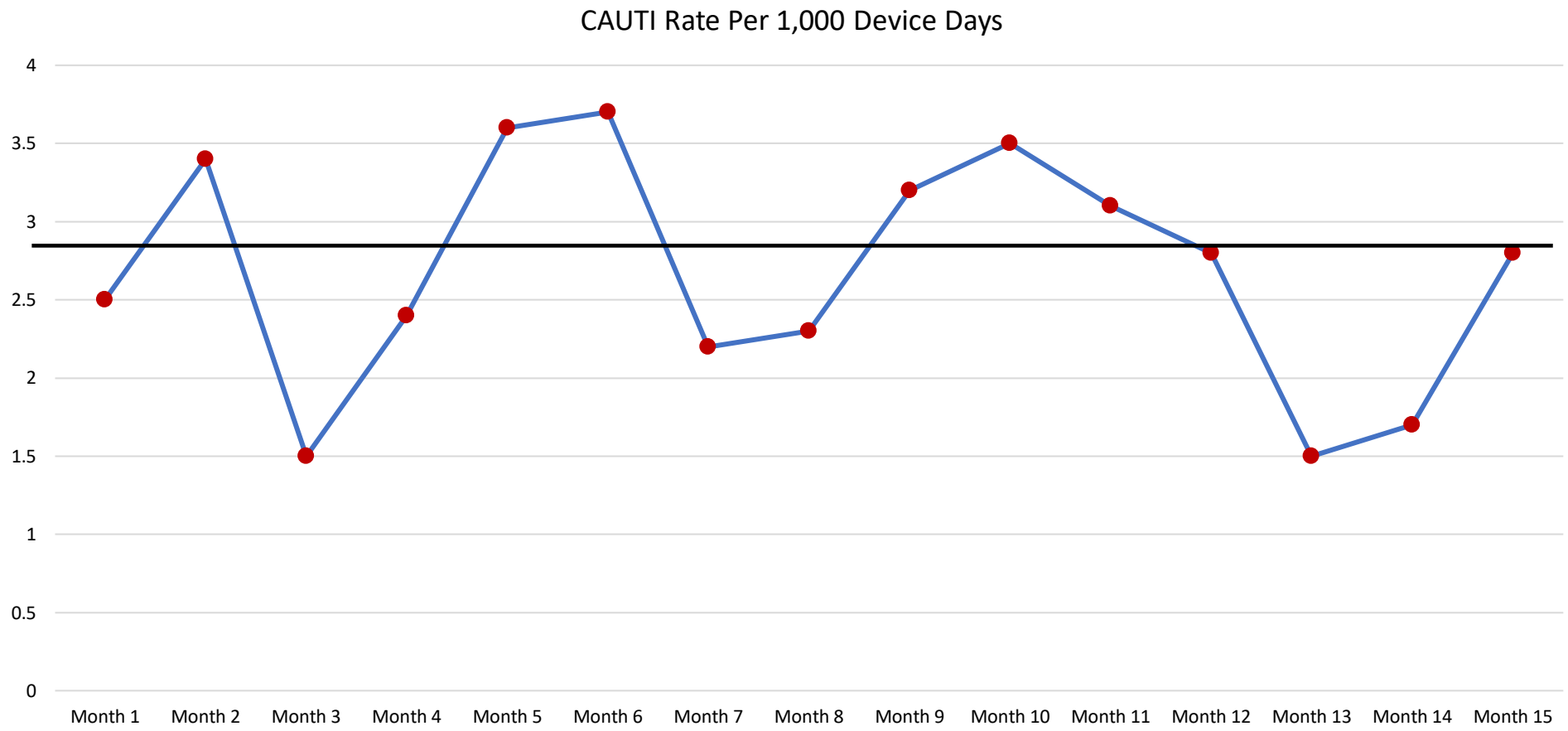
Applying our Learning….



Which rules apply here?

Mentimeter

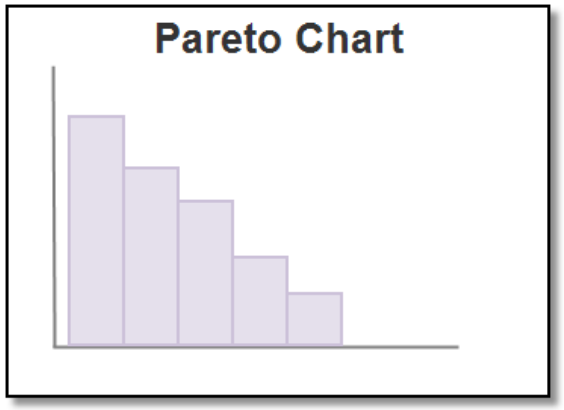
Step 5: Assess your baseline run chart



Which rules apply here?

Pareto Charts

Break into parts



What do you want to do?

You want to show:

- How various parts comprise the whole
- Identify which problem should be studied.
- Which potential causes of the problem are most significant.

Type of Chart: Pareto Chart

Break down data to analyze amount & cumulative percentage

Examples:

- Patients by age, acuity, location
- Results by patient unit

Pareto Principle

Vilfredo Pareto discovered that:

That 20% of the factors account for 80% of the results.

- The 20% may be referred to as the "**Vital Few**"
- The remaining 80% may be referred to as the "**Trivial Many**"

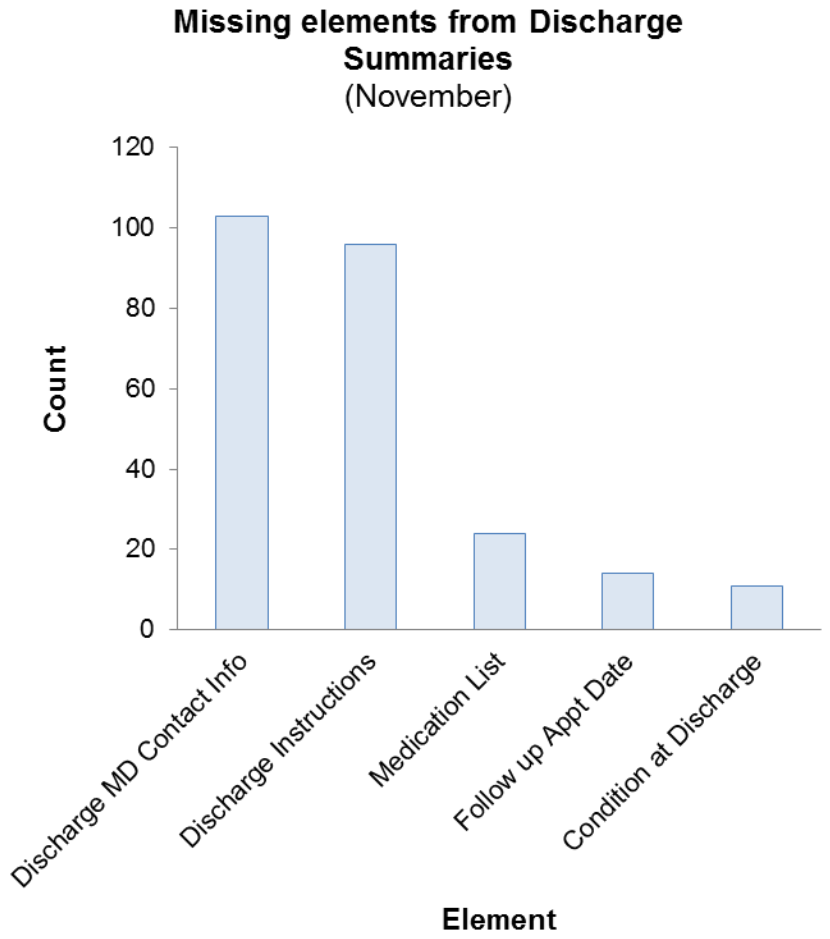
The Pareto principle:

- implies that we can frequently solve a problem by identifying and attacking the "vital few" (20%) sources.
- can be applied to most systems and processes.
- is used to dissect a large problem into smaller pieces

Pareto Chart

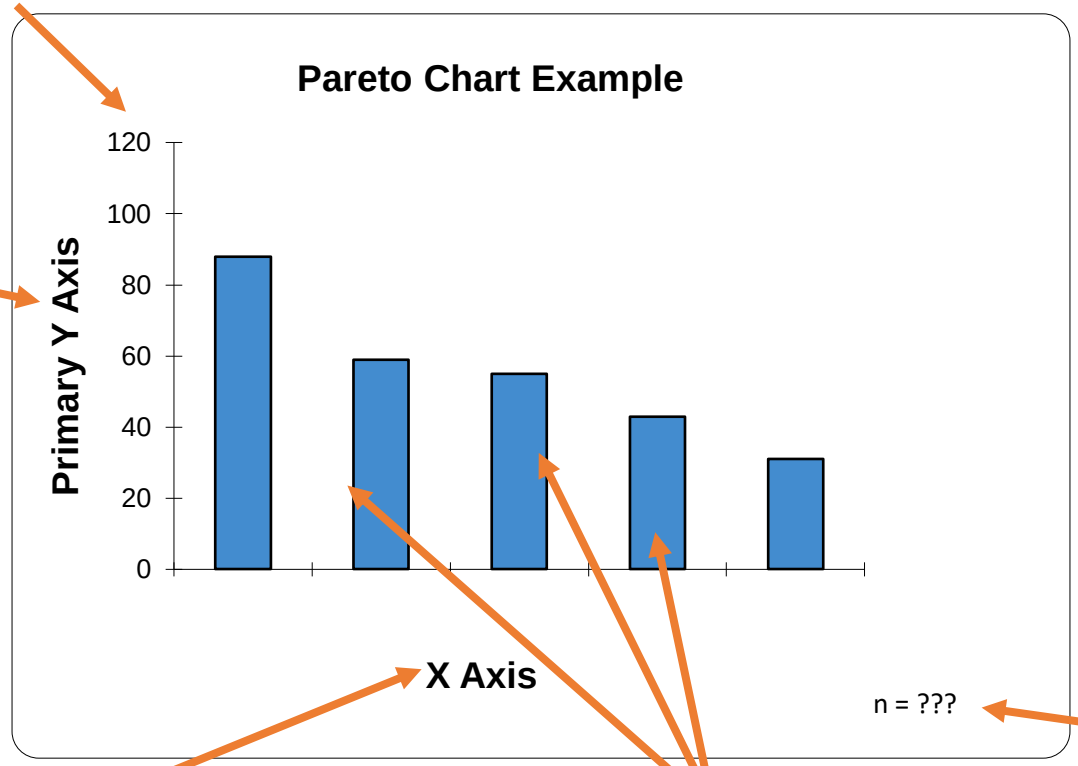
Pareto Charts are specialized bar charts that separate data into ‘prioritize’ columns that represent the quantity of a variable for each category.

- The visual height of the bars quickly communicates the value, importance, or effect of a category.
- Data is arranged in descending order.



Pareto Chart – version 1

Never > the count of the largest condition



Primary Y axis shows the numerical value or count

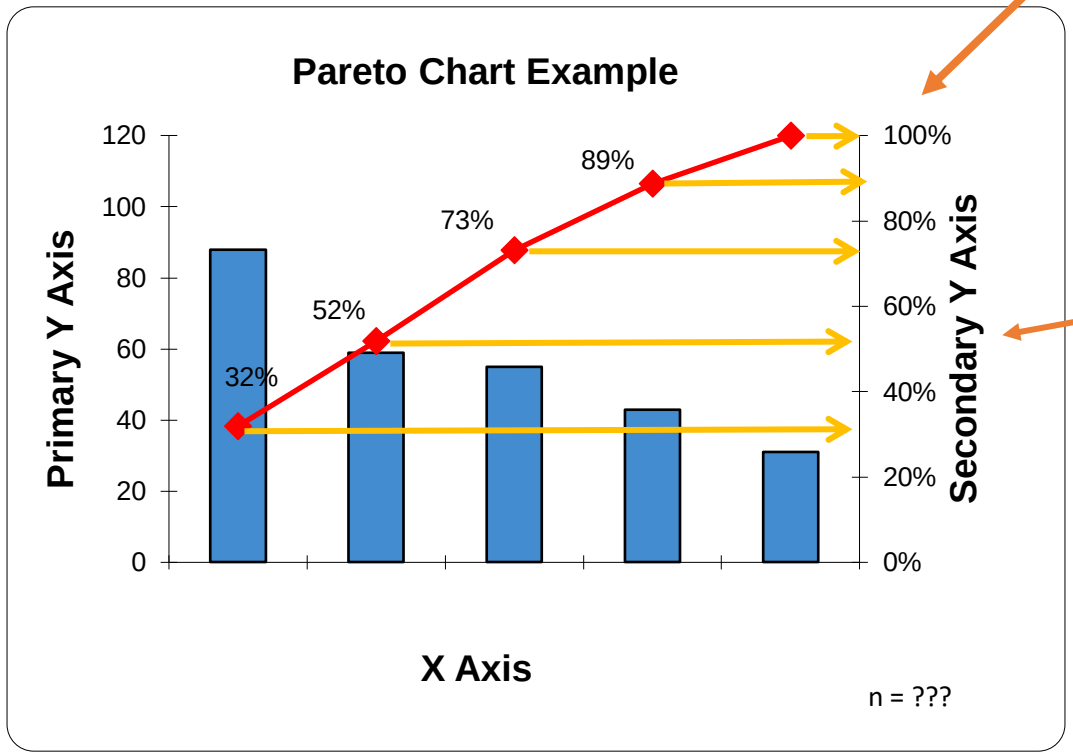
Provides to sample size

Horizontal "X" axis indicates each condition

Data are arranged in descending order

Pareto Chart – version 2

Never > 100%

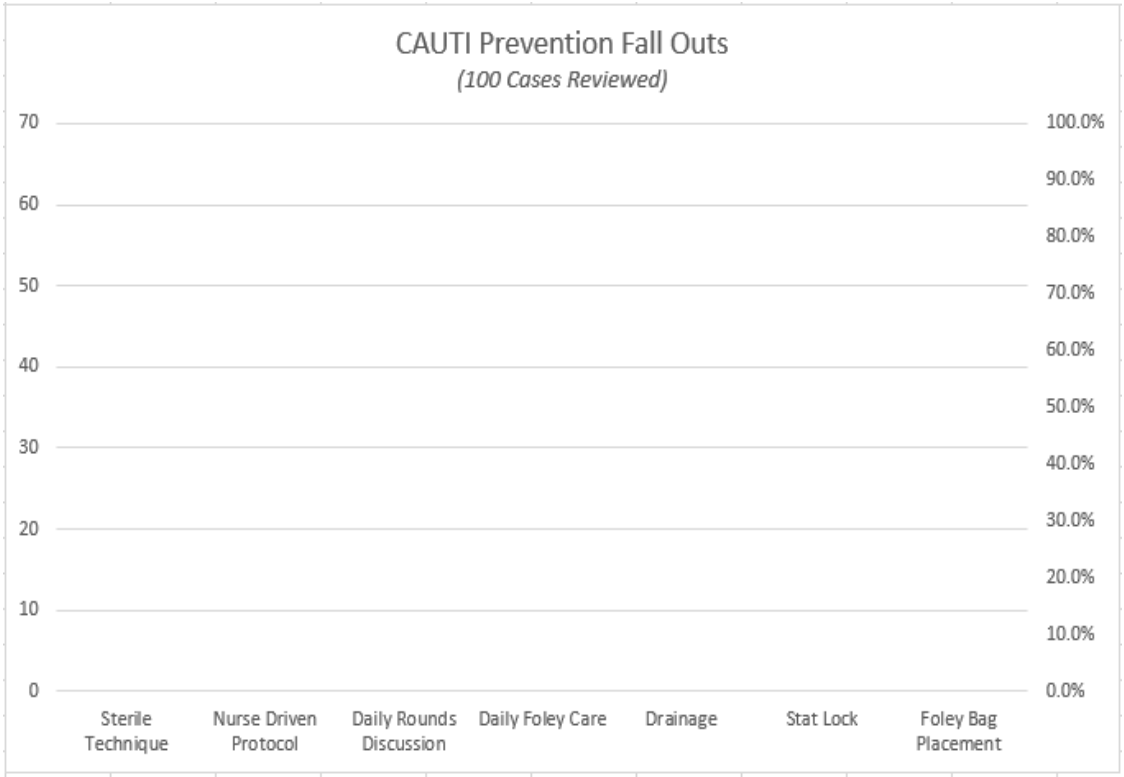


Secondary "Y" Axis is the Cumulative Percentage

Worksheet Exercise: 5 Minutes

Step 6: Breakdown the problem using a PARETO chart

Process Step	Non-Compliance	Cumulative Total	Cumulative %
Sterile Technique	62	62	62 / 121 = 51.23%
Nurse Driven Protocol	15	62 + 15 = 77	77 / 121 = 63.6%
Daily Rounds Discussion	12	77 + 12 = 89	89/121=73.6%
Daily Foley Care	11	89 + 11 =	
Drainage	9		
Stat Lock	7		
Foley Bag Placement	5		
TOTAL	**121**		



Worksheet Exercise: 5 Minutes

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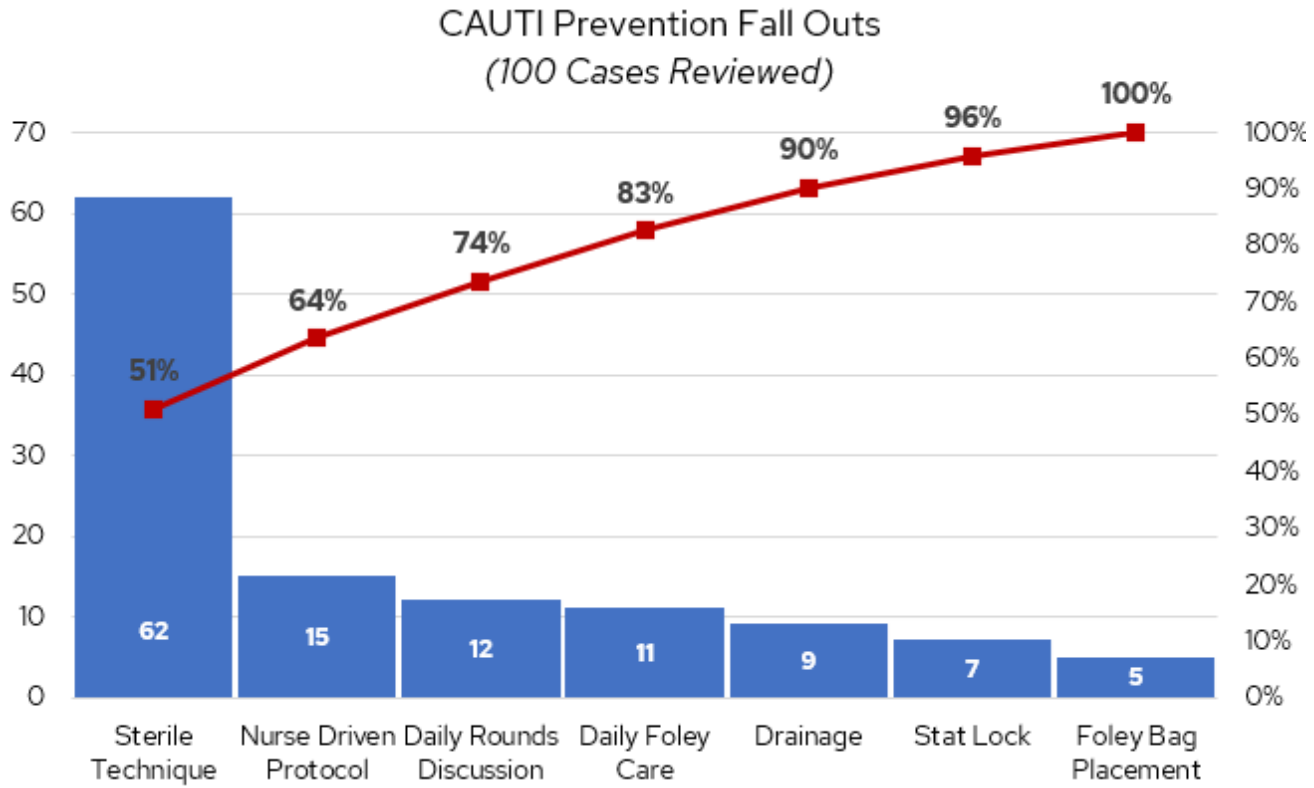
Daily Rounds Discussion	12	77 + 12 = 89	89/121=73.6%
Daily Foley Care	11	**89 + 11 = 100**	**100/121=82.6%**
Drainage	9	**100+9=109**	**109/121=90.1%**
Stat Lock	7	**109+7=116**	**116/121=95.9%**
Foley Bag Placement	5	**116+5=121**	**121/121=100%**
TOTAL	**121**		



Pareto Chart

- Pareto Charts are specialized bar charts that separate data into ‘prioritize’ columns that represent the quantity of a variable for each category.
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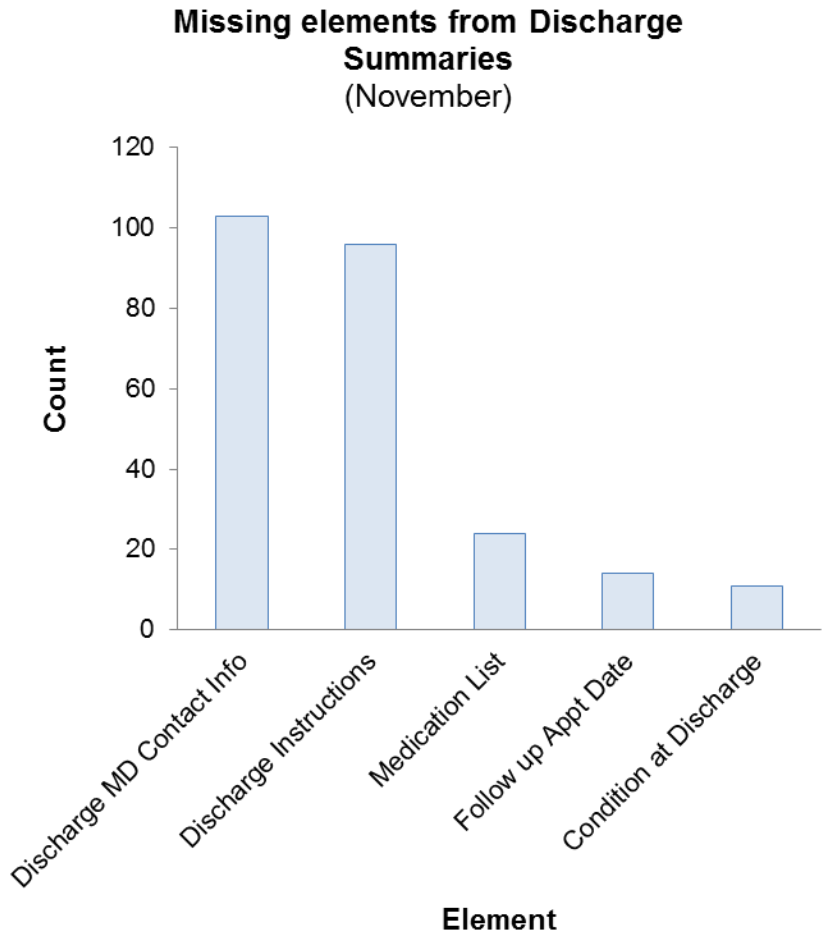
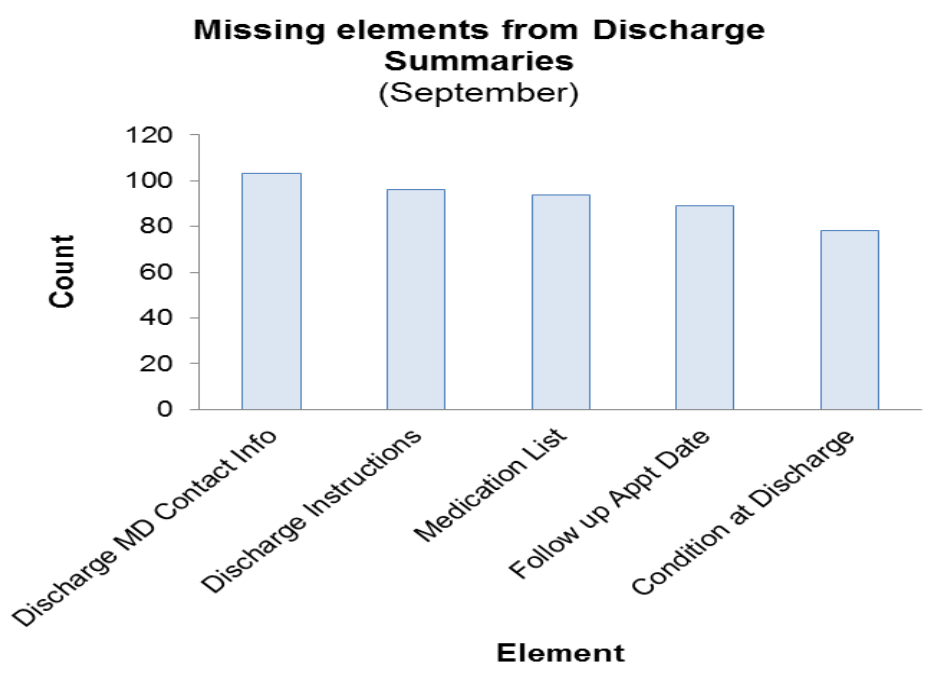
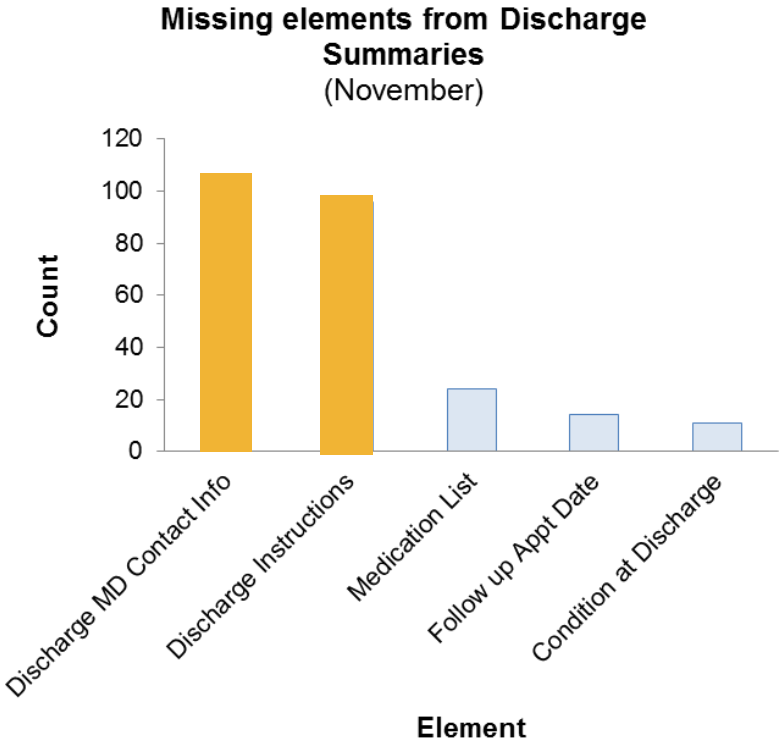


Pareto Chart Analysis





Analysis:

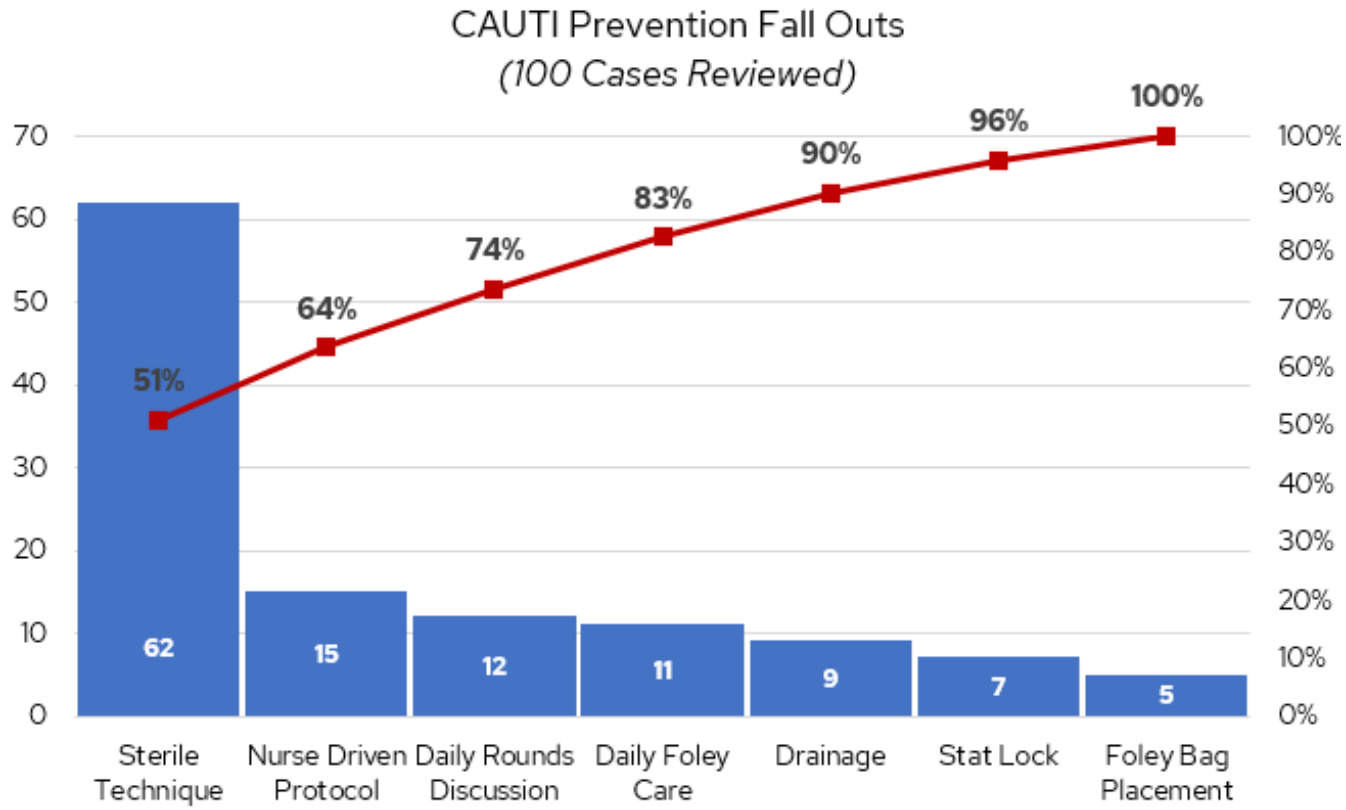
Chart A - fairly 'flat' distribution of missing elements (problems are more wide spread /general)

Chart B - distinctive 80/20 rule of missing elements (problems are more narrow /specific)

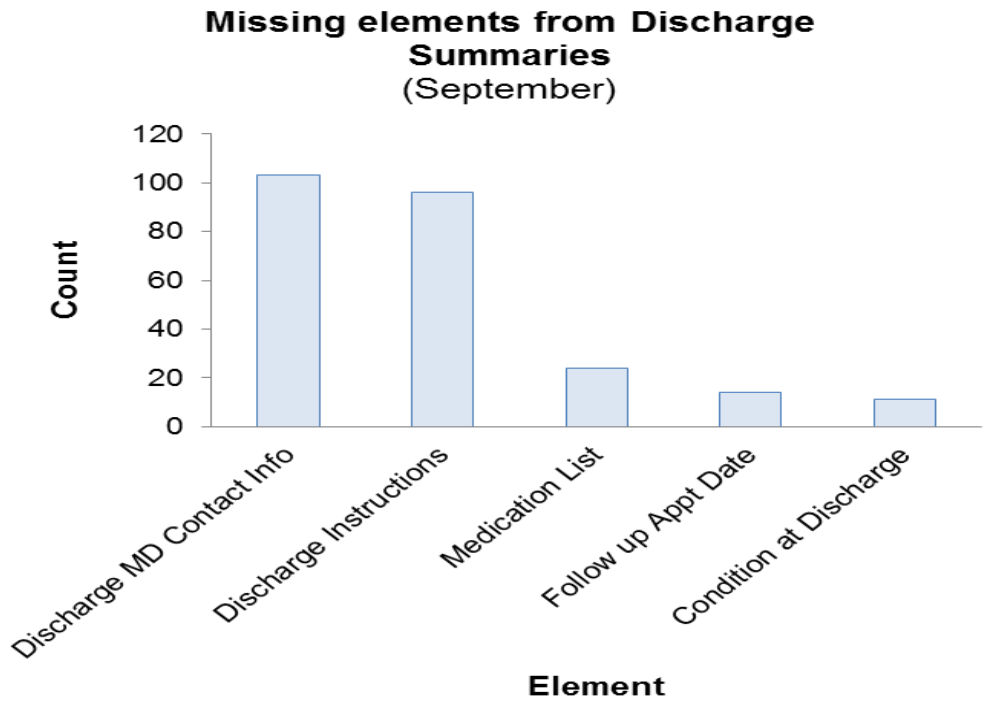
Group Discussion

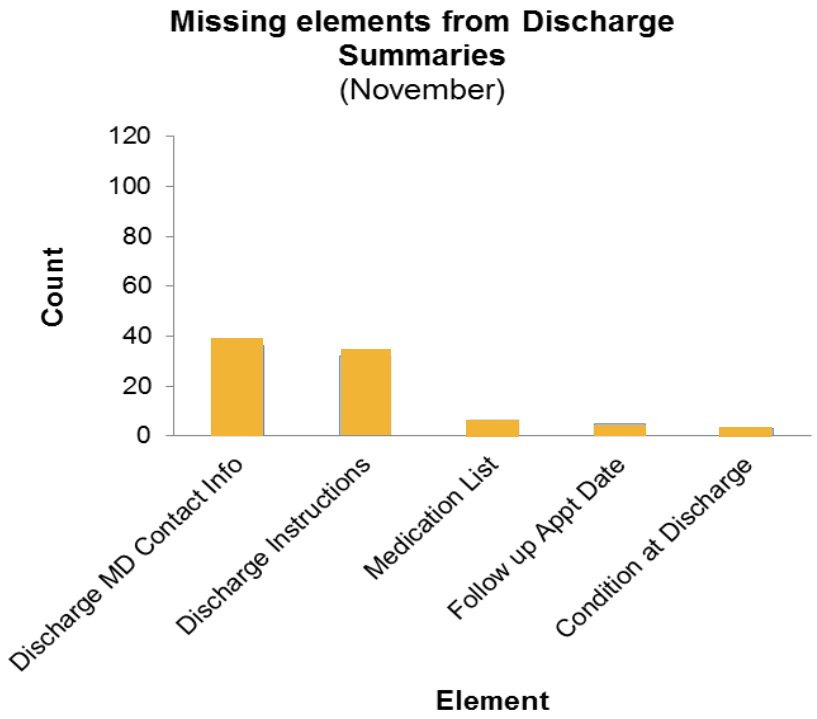
Step 6: Interpret the Pareto Chart

- Does the PARETO principle apply?
- What would you recommend to the team as their next step?



Pareto Chart Analysis

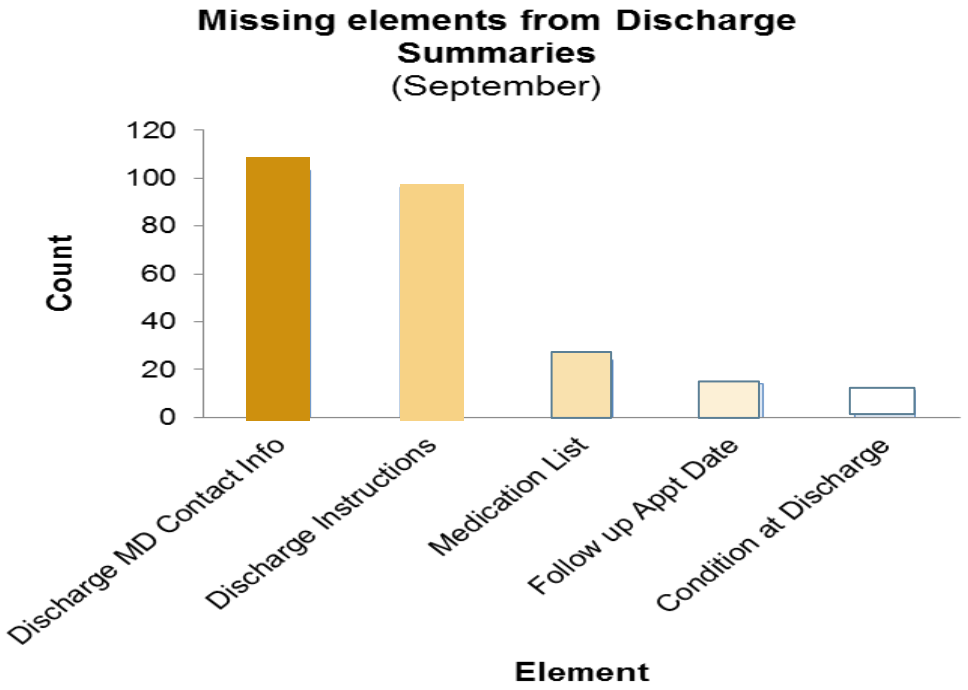


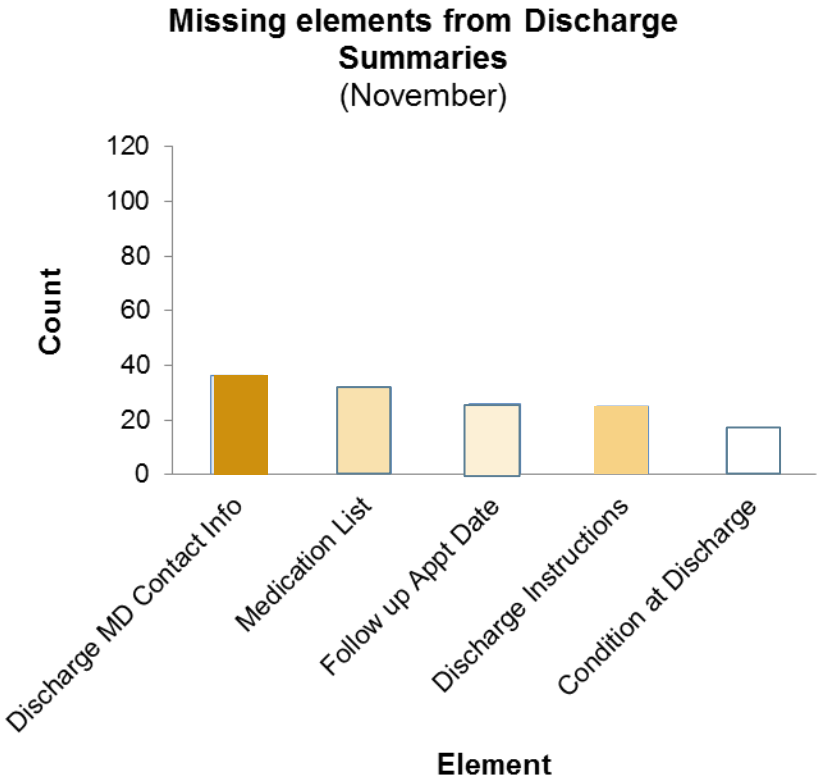


Analysis:

Significant reduction of missing elements from Chart A to Chart B

Pareto Chart Analysis



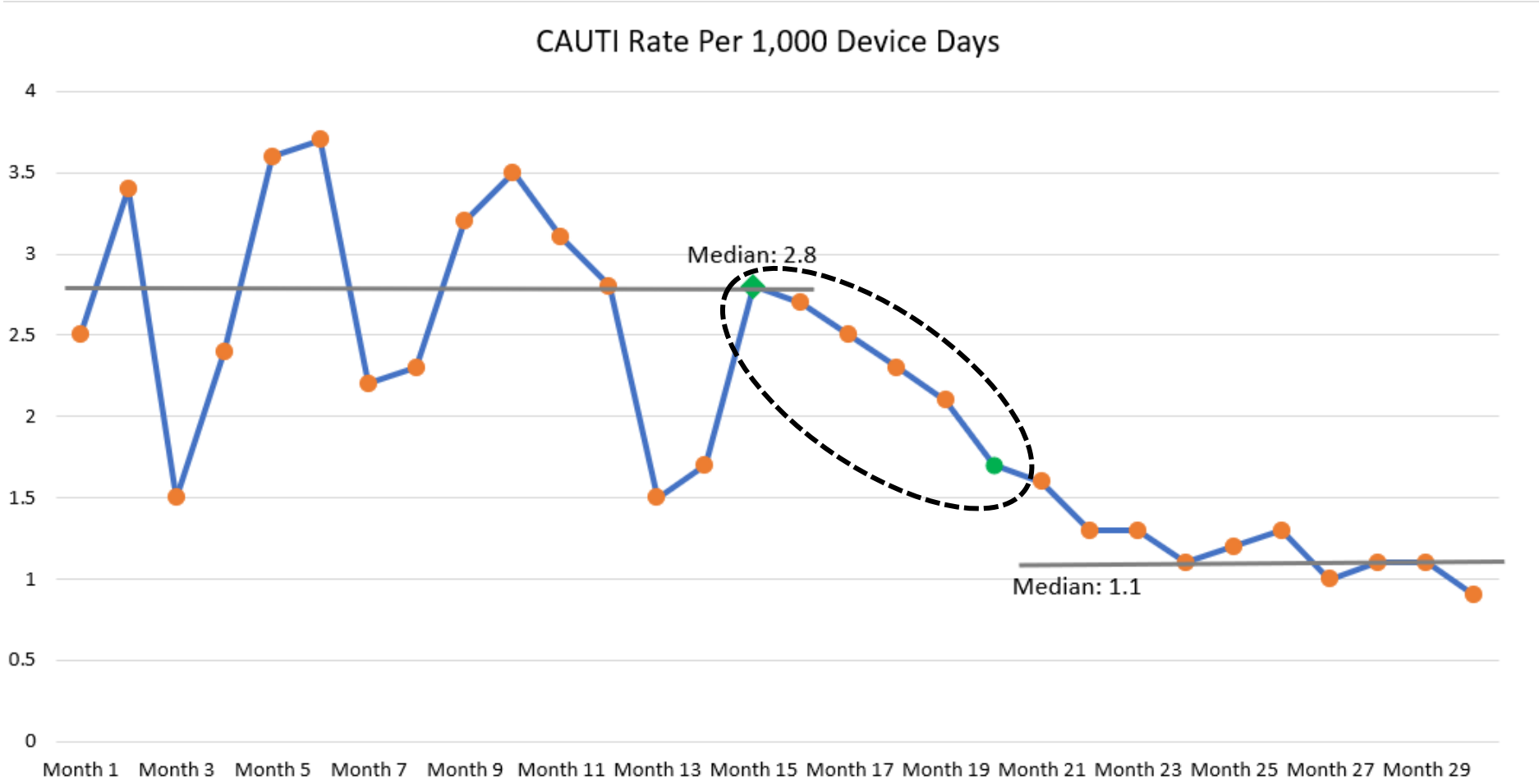


Analysis:

Significant reduction of missing elements from Chart A to Chart B

Reordering of missing elements from Chart A to Chart B

Revisit Your Run Chart



Summary

1. Understand the importance of using data to drive improvement
2. Define the types of quality measures
    - Outcome
    - Process
    - Balance
3. Introduce the quantitative tools that can be used for displaying and analyzing data
    - Run Charts
    - Pareto Charts

THANK YOU!