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How to Make Your Data Talk!

Montreal
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SHN Ontario

Reducing Harm | Improving Healthcare | Protecting Canadians



“When you two have finished arguing your opinions, I actually have data!”

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Objectives

In the next 15-20 Minutes we will:

- Review the concept of variation
- Use run charts effectively to understand what your data is telling you
- Use the Pareto Principle to focus your improvement work

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What Do We Need to Know?

- How much variation do we have?
- Is this process changing significantly over time?
- Have our changes resulted in improvement?
- Are we holding the improvement?



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What is Normal Variation?

“Every process is perfectly designed to get the results it gets”. Don Berwick

Normal variation is inherent in the existing process and is not related to a specific cause or event, but rather to how the process is designed.

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What is Special Cause Variation?

Special cause variation is a change in our data in response to a specific, unusual event or impact on the process.

How do we know the difference?

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Use a Run Chart

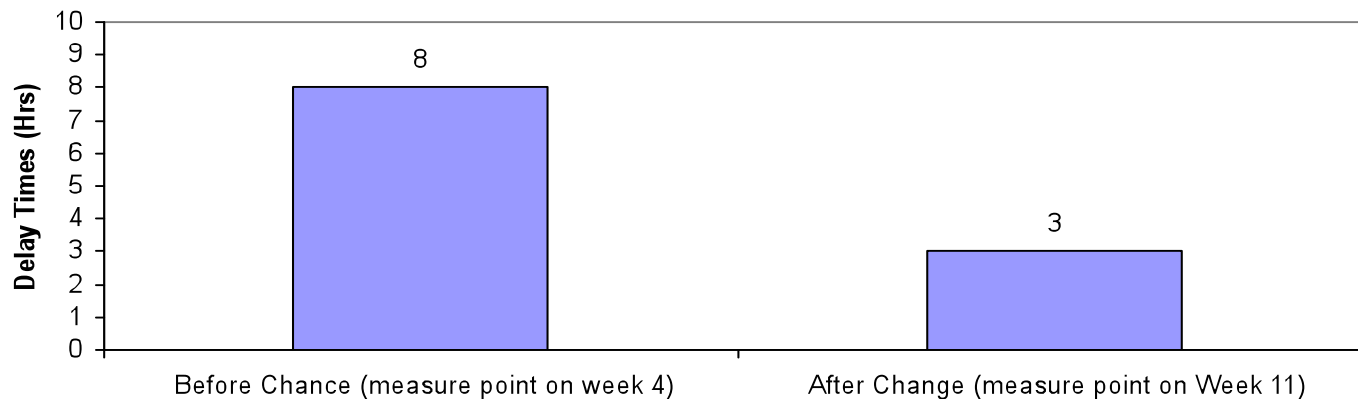
- A line graph of data plotted over time
- Data is kept in time order
- Can see flow of data
- Helps answer our improvement questions



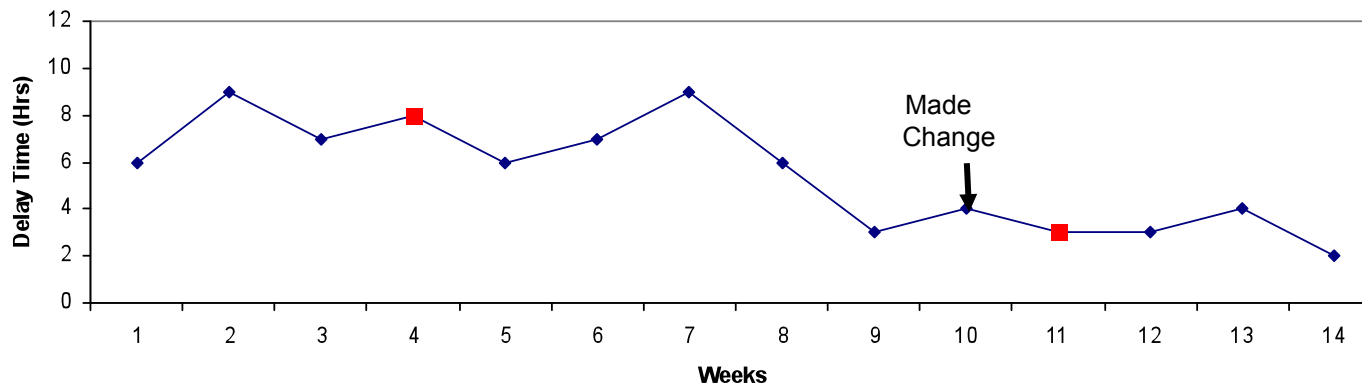
'And this is the period when the cat was away.'

Why Use a Run Chart?

**Before and After Test
(Change Made Between Week 7 & Week 8)**



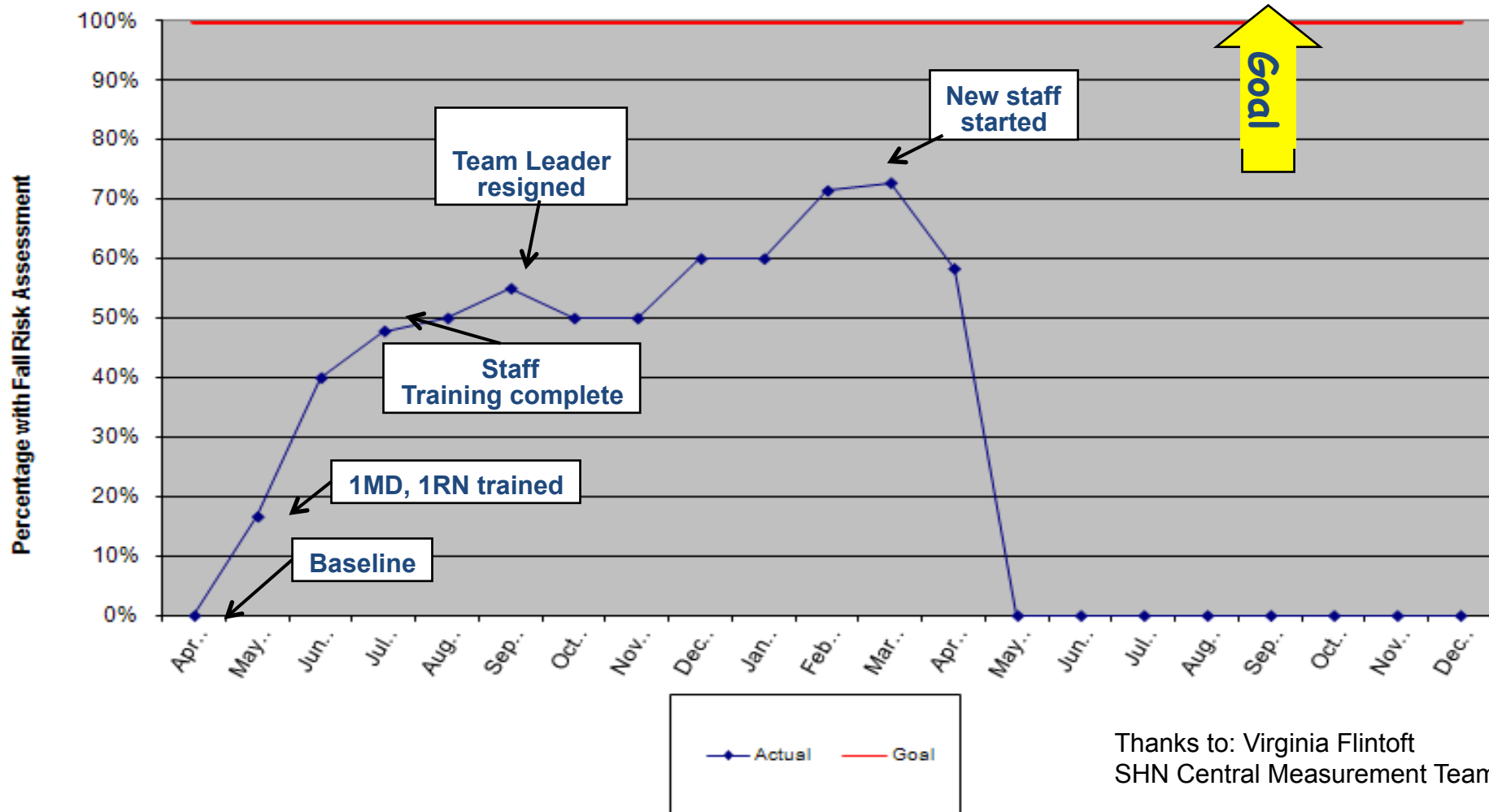
Case 1



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Run Chart – Falls 4.0

4.0 Percentage of Residents with Completed Fall Risk Assessment Following Falls or Change in Medical Status



Include the Median

In a series of numbers, the median is physically the middle number .

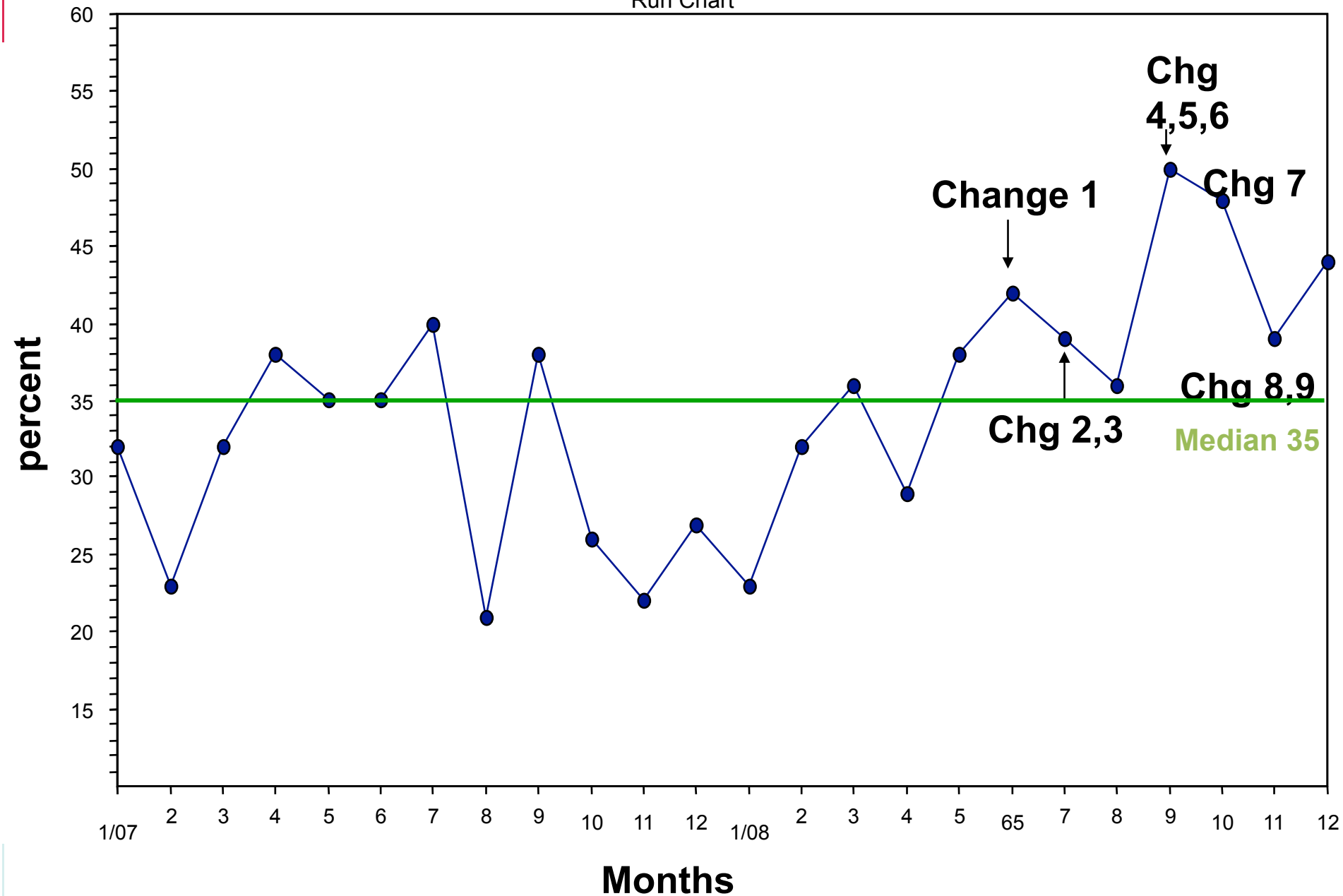
It has the same number of points equal to it or above it as it has equal to it or below it.

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% Timely Reperfusion

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------|------|----|----|----|----|----|----|----|----|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|
| Date | 1/07 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1/08 | 2 | 3 | 4 | 5 | 65 | 7 | 8 | 9 | 10 | 11 | 12 |
| Data | 32 | 23 | 32 | 38 | 35 | 35 | 40 | 21 | 38 | 26 | 22 | 27 | 23 | 32 | 36 | 29 | 38 | 42 | 39 | 36 | 50 | 48 | 39 | 44 |

Run Chart



Finding the Median: Reordering the Data

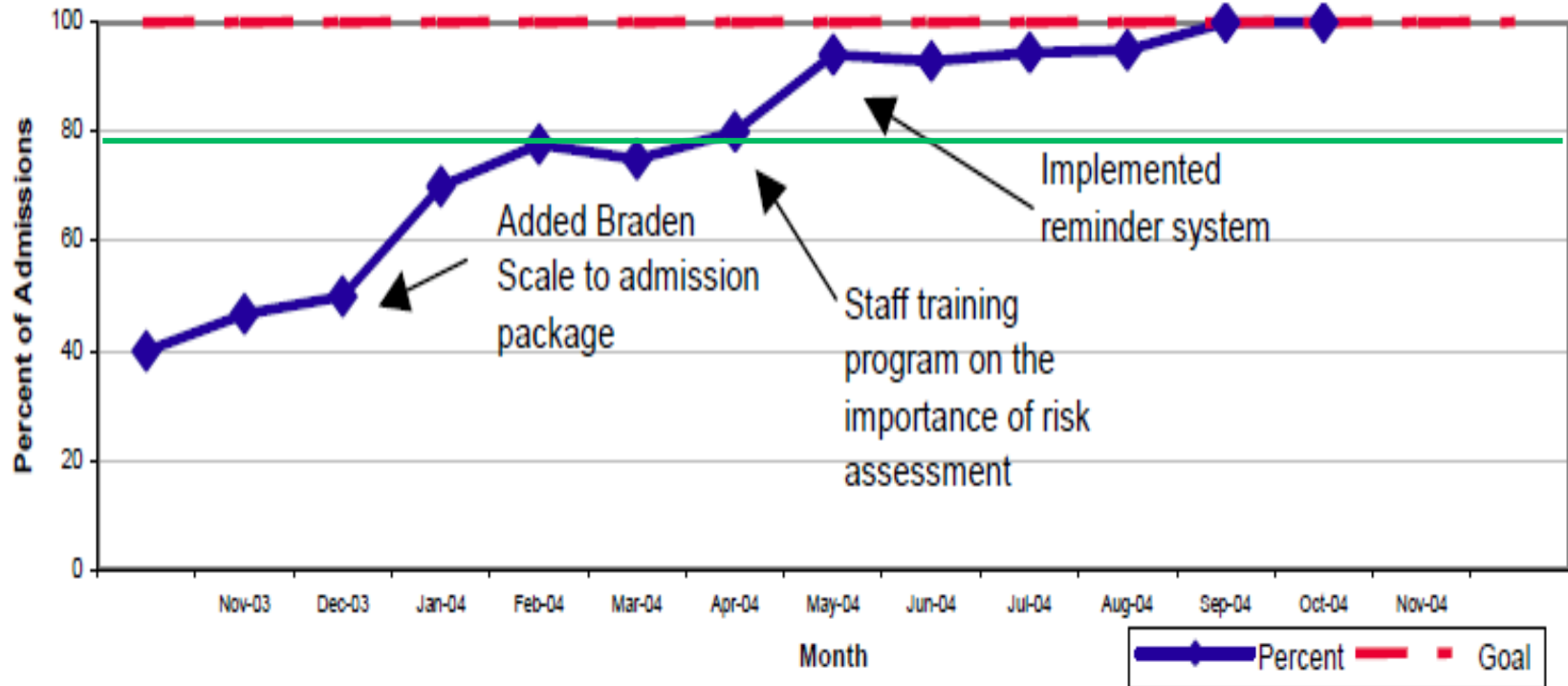
50
48
44
42
40
39
39
38
38
38
36
35
35
35
32
32
32
29
27
26
23
23
22
21

- To find the median reorder the numbers from high to low and find the number physically in the middle. If you have two numbers left in the middle, add them together and divide by two.
- Excel: place cursor in blank cell and type=`MEDIAN(A2:A21)` where A2 is the first cell you want to include and A21 the last)

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Example

Percent of Admissions that have a Risk Assessment Within One Calendar Day

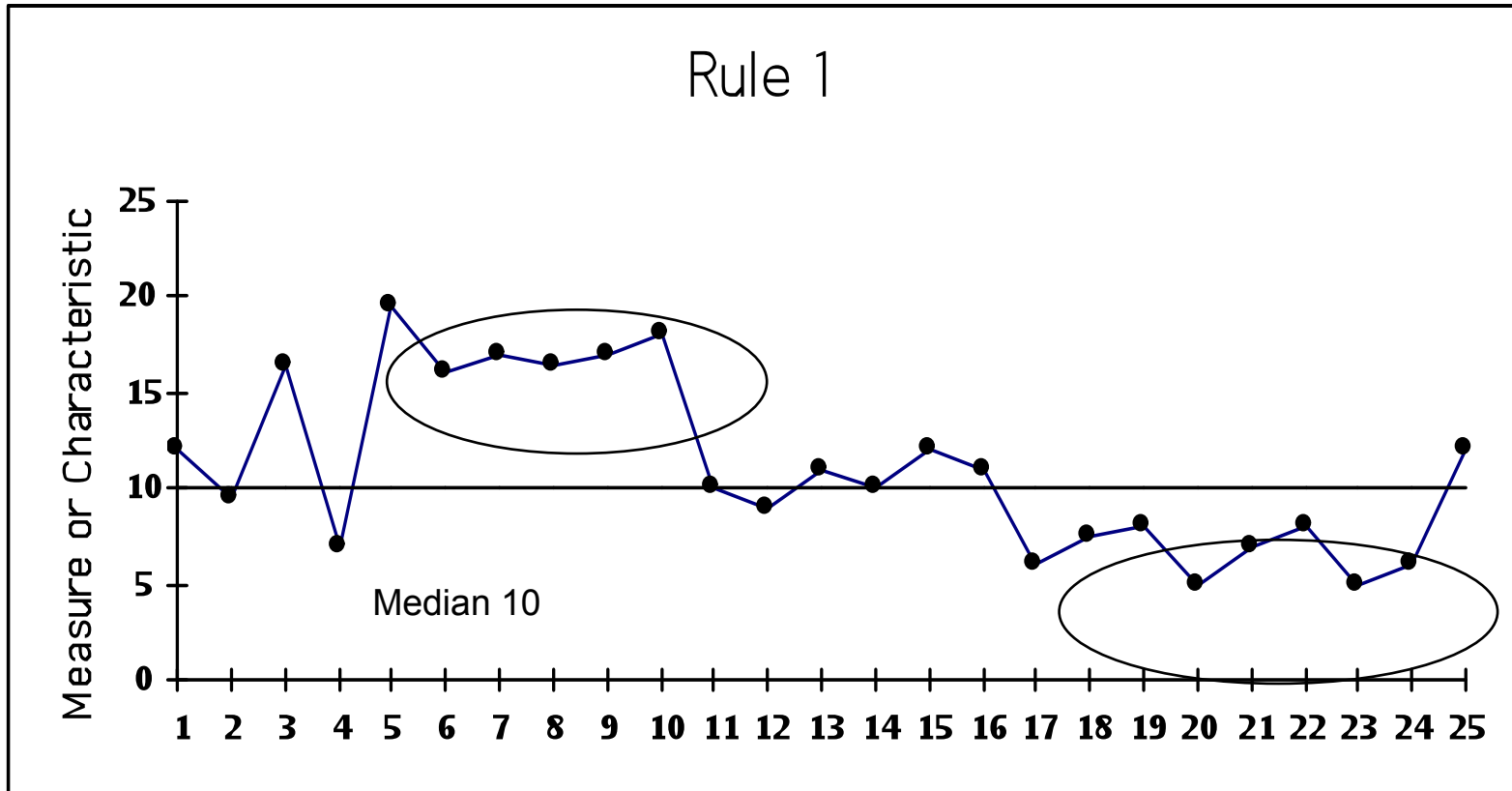


Source: National Nursing Home Improvement Collaborative: Pressure Ulcer Prevention and Treatment *Handbook*, Qualis Health

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Rule 1

Six or more consecutive POINTS either all above or all below the median. Skip values on the median and continue counting points. Values on the median DO NOT make or break a shift.

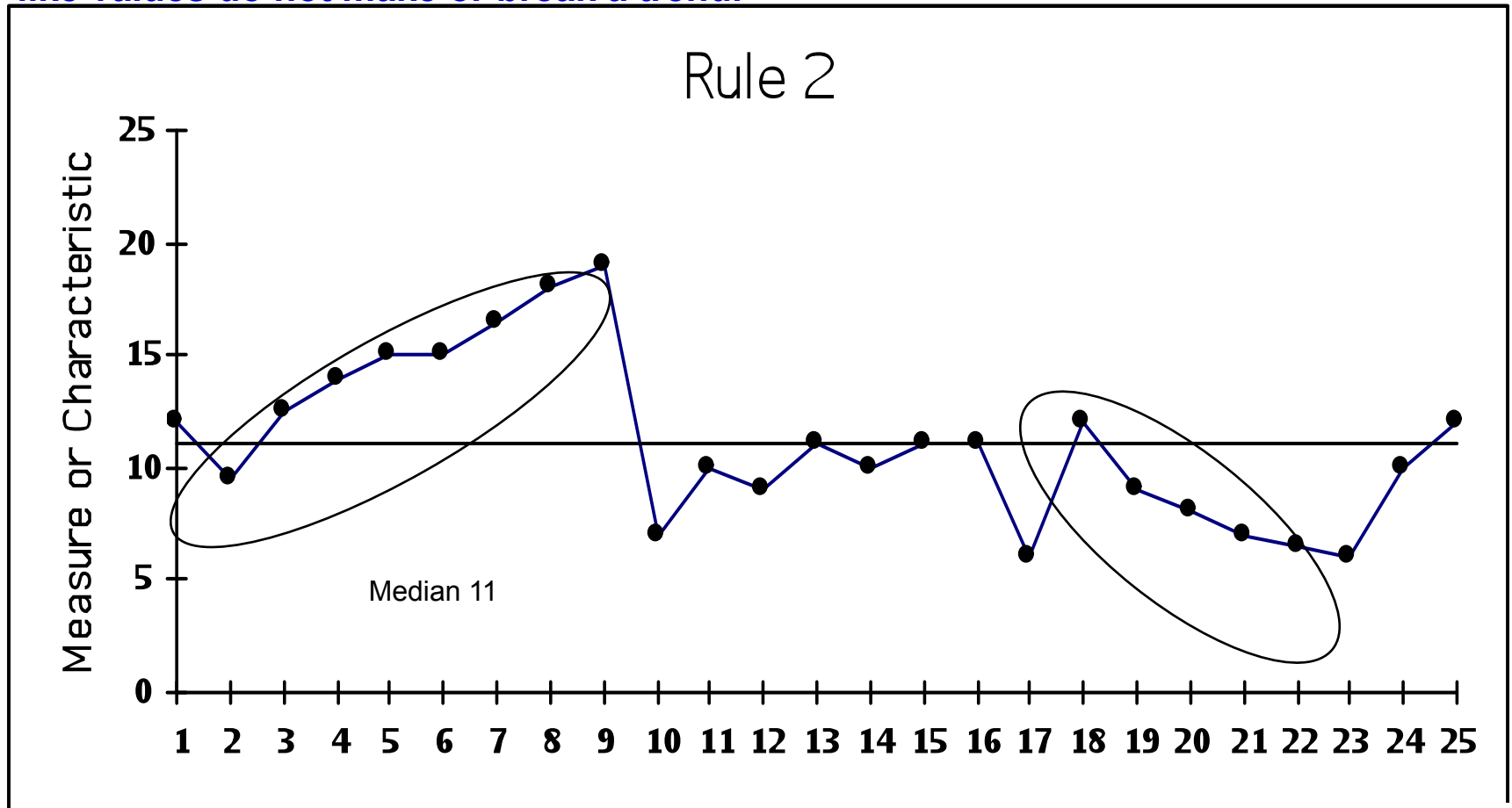


Ott, Ellis, *Process Quality Control*, McGraw-Hill Book Company, NY, 1975 ; Provost, L and Murray, S. *The Health Care Data Guide*. Jossey Bass, 2011

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Rule 2

Five points all going up or all going down. If the value of two or more successive points is the same count the first one then ignore the identical points when counting; **like values do not make or break a trend.**

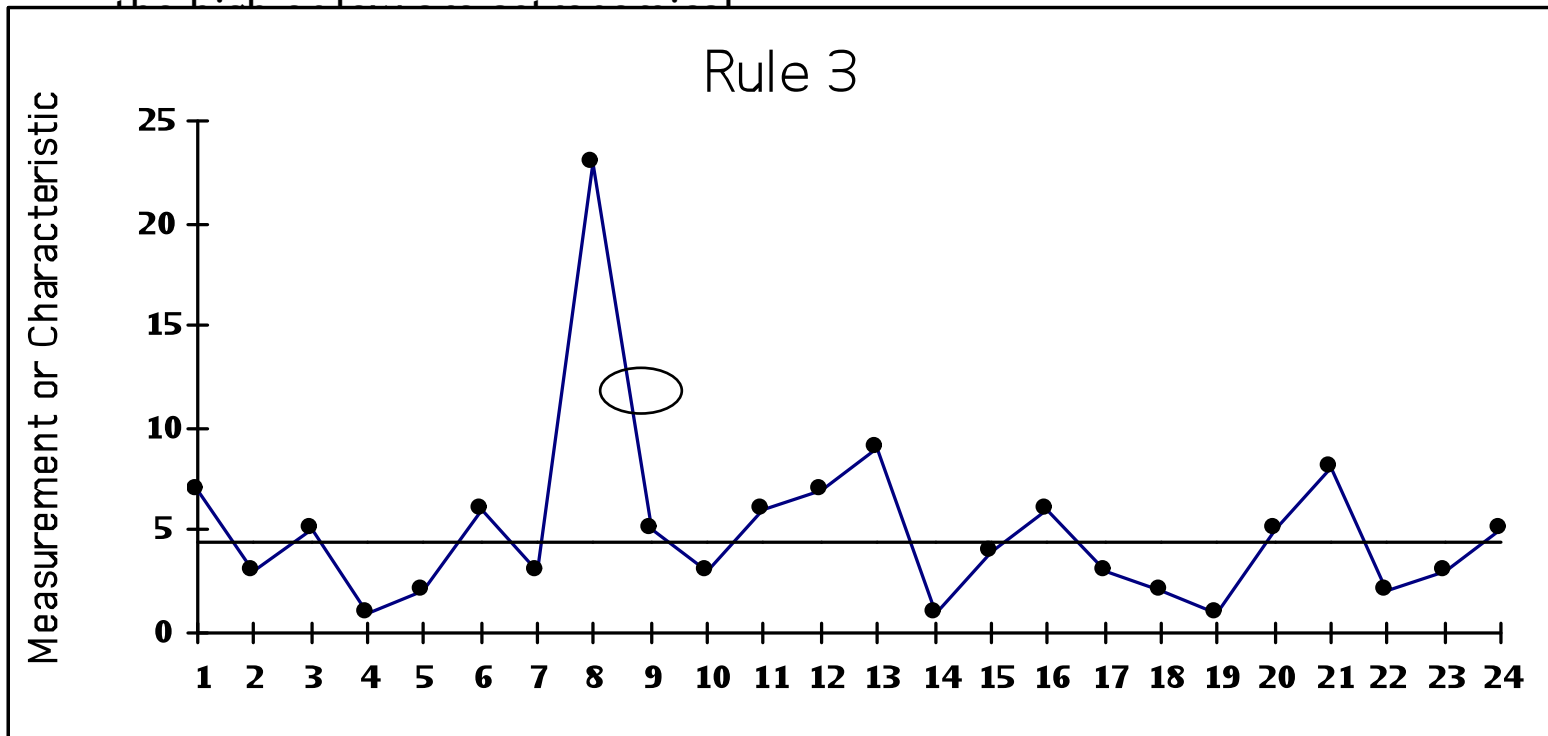


Olmstead, PI, "Distribution of Sample Arrangements for Runs Up and Down, Annals of Mathematical Statistics, Vol 17, pp. 24-33, March, 1945. Provost, L and Murray, S. The Health Care Data Guide. Jossey Bass, 2011

RULE₃

For detecting **unusually** large or small numbers:

- Data that is **Blatantly Obvious** as a different value
- Everyone studying the chart agrees that it is unusual
- Remember: Every data set will have a high and a low - this does not mean

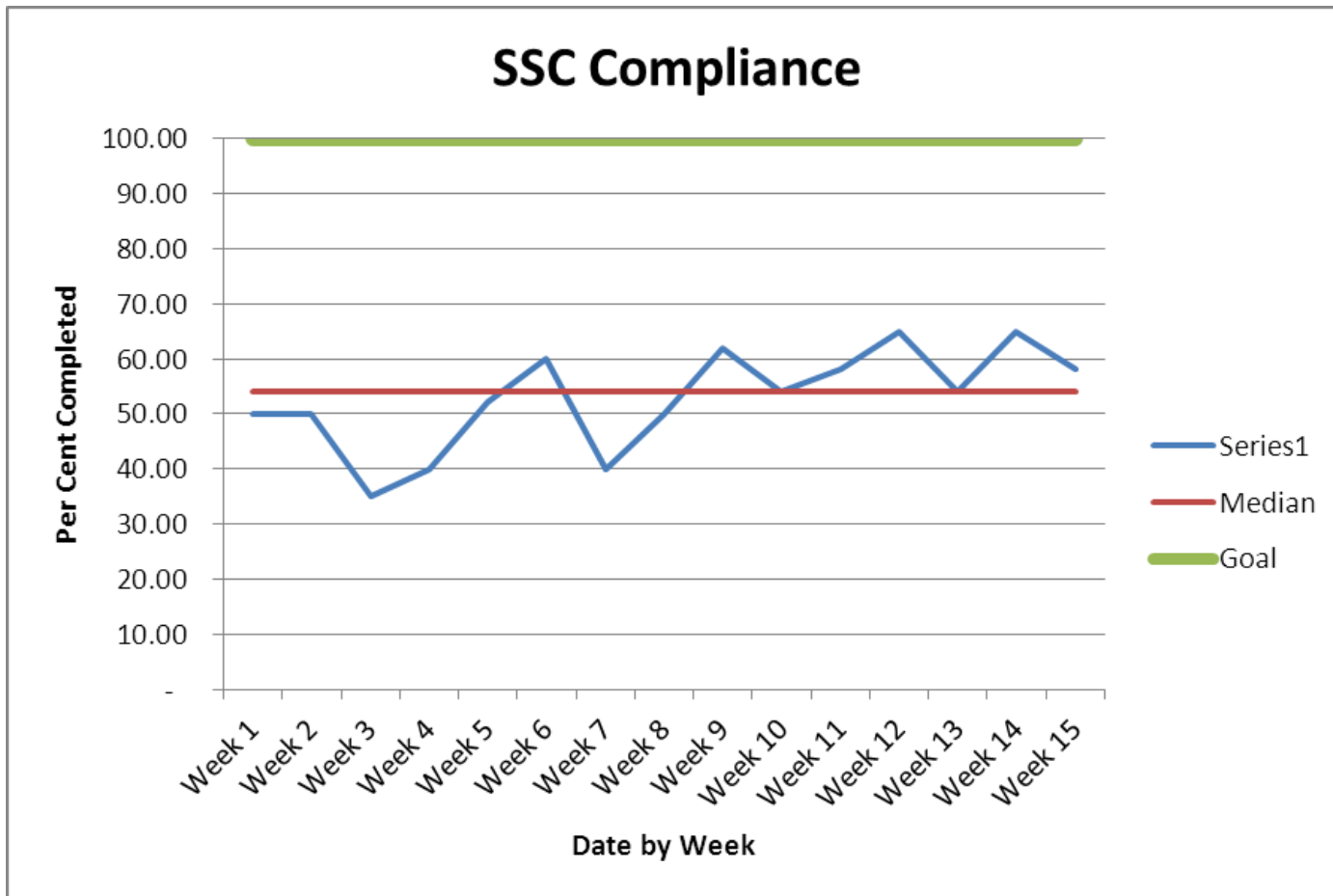


Provost, L and Murray, S. The Health Care Data Guide. Jossey Bass, 2011

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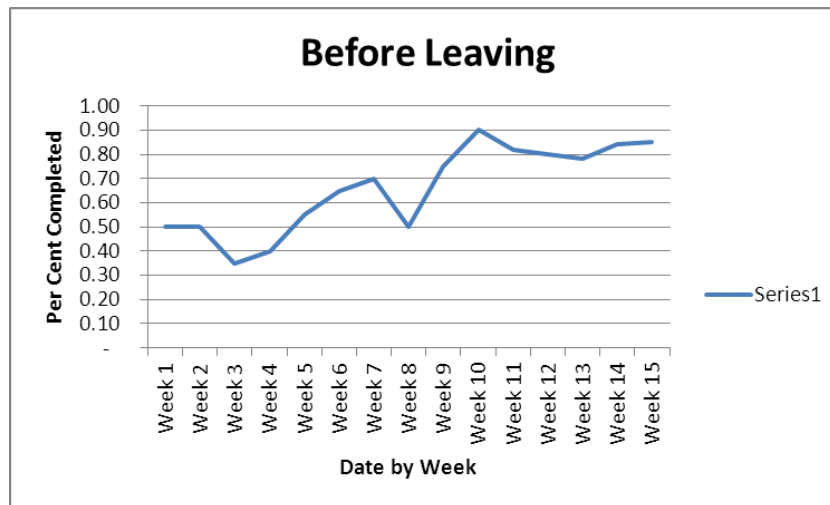
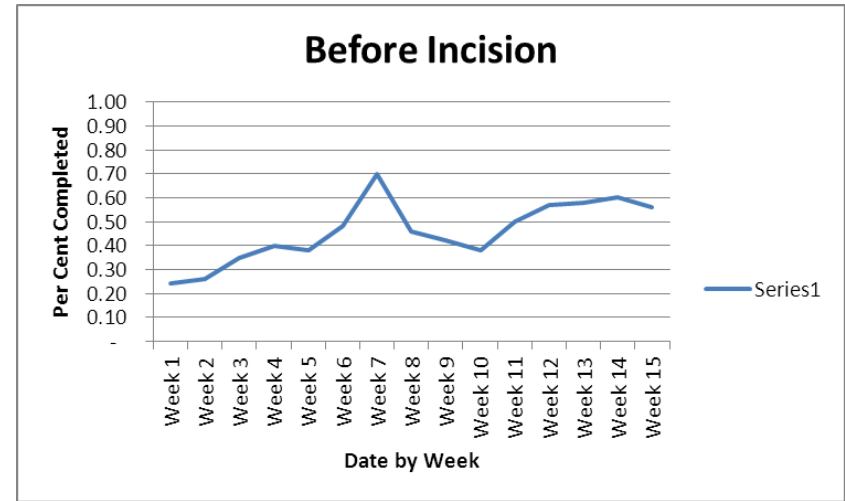
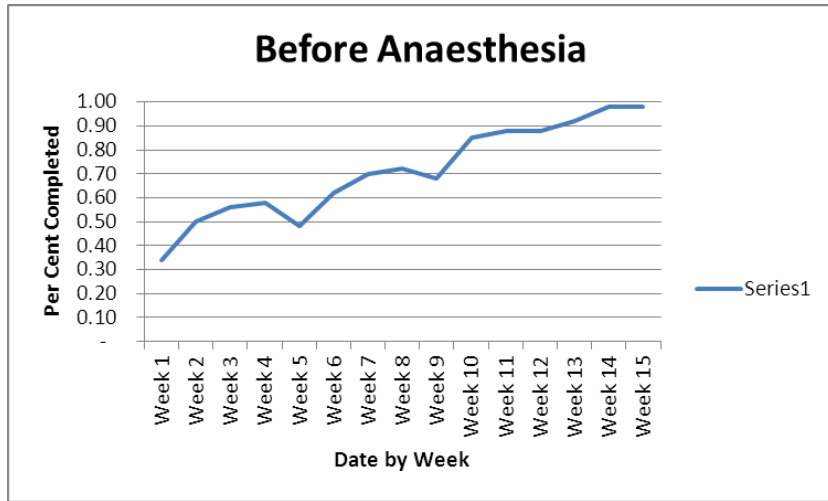
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Checklist Process



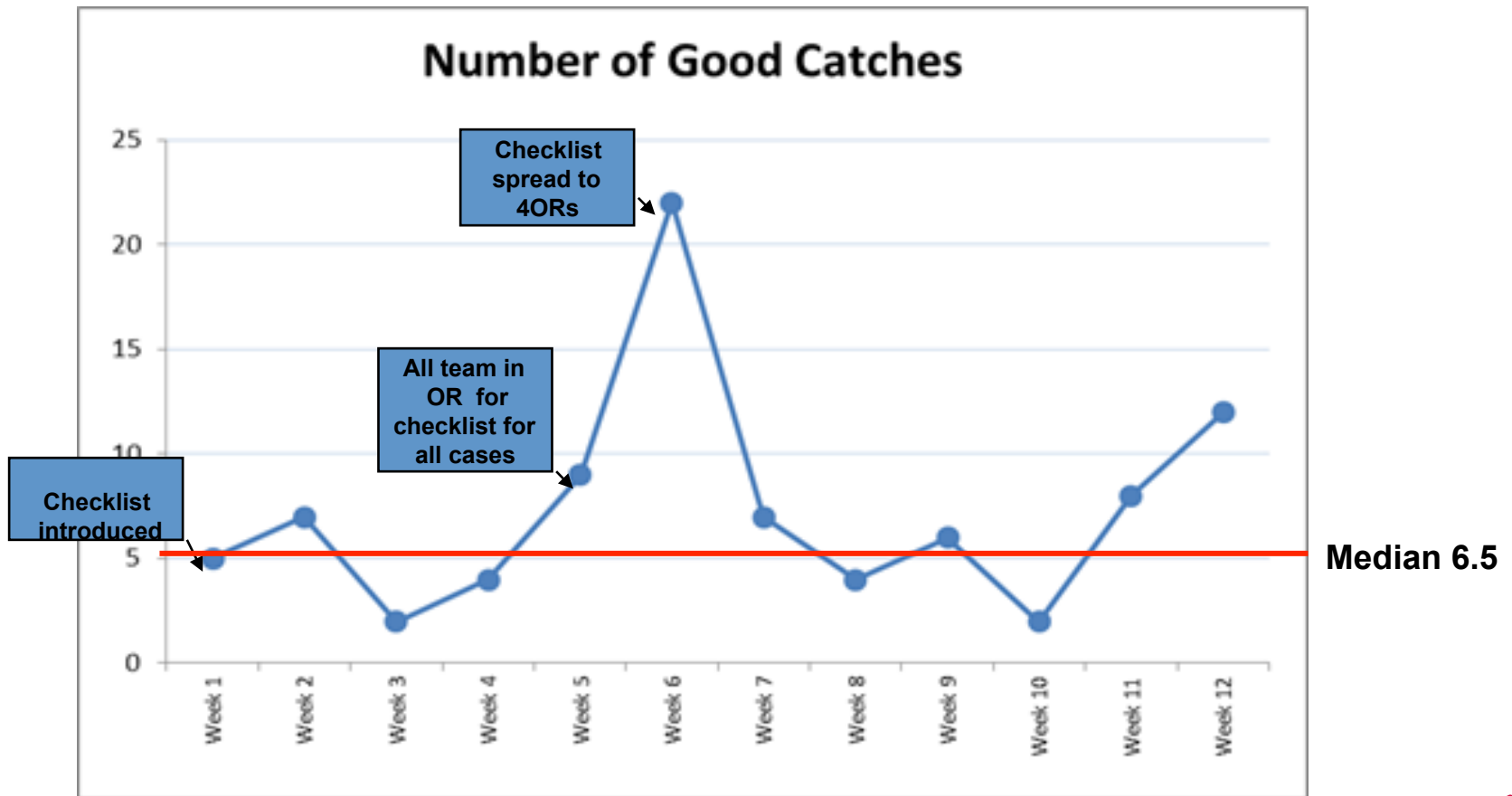
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Use Small Multiples to Tell the Whole Story



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Tracking Checklist Impact



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Key Points

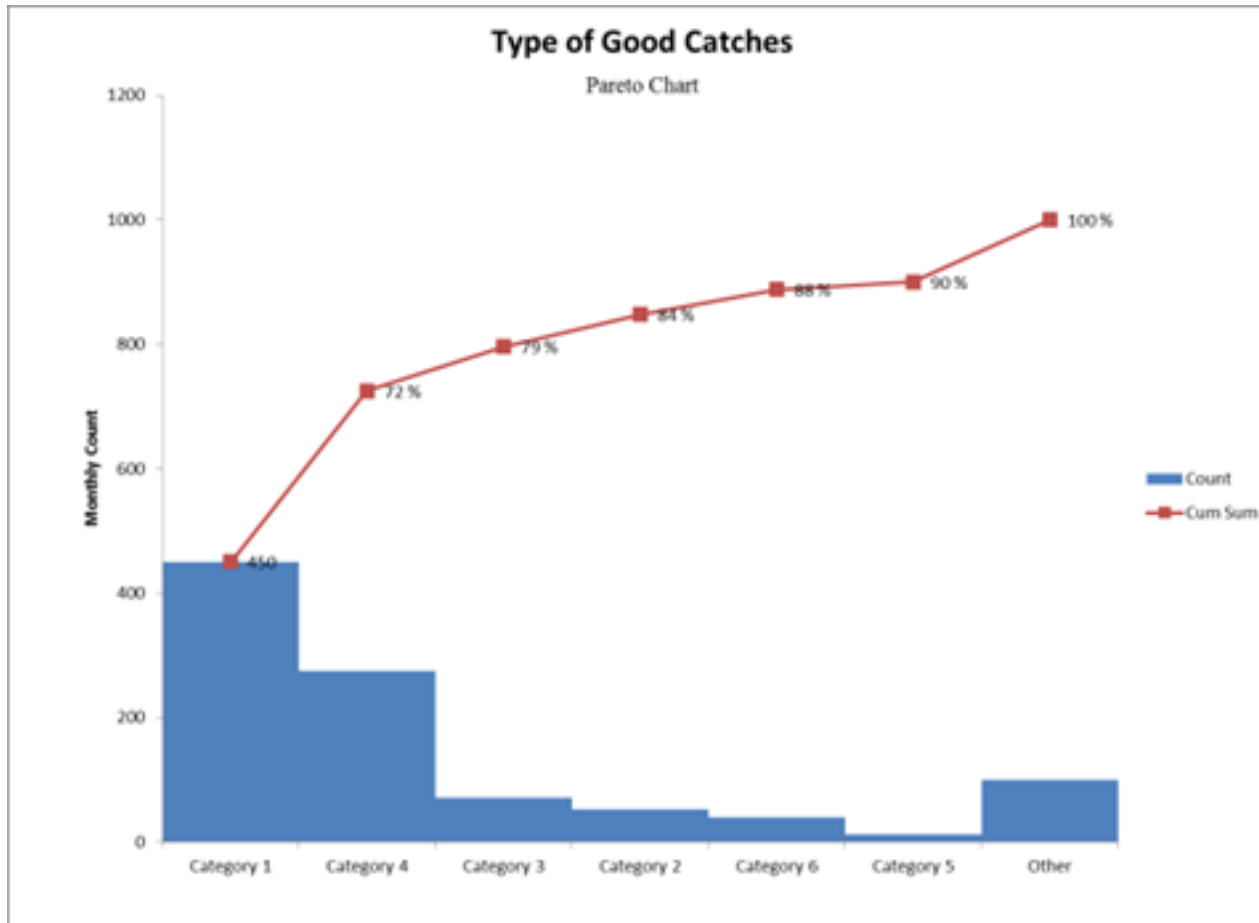
- Use a run chart to display your data over time
- Include a Goal line and/or desired direction
- Calculate and show a Median line to see trends
- Analyze your data “by the rules”

Key Points

- Annotate your run chart - it tells your story
- Annotation helps you see the impact of your tests of change and can help you decide to “adopt, adapt or abandon” a change.
- Use Small Multiples to see how parts of the process contribute to the overall process performance

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Use Pareto Thinking to Focus Improvement Efforts



Thanks to Leanne Couves and Tanis Rollefstad

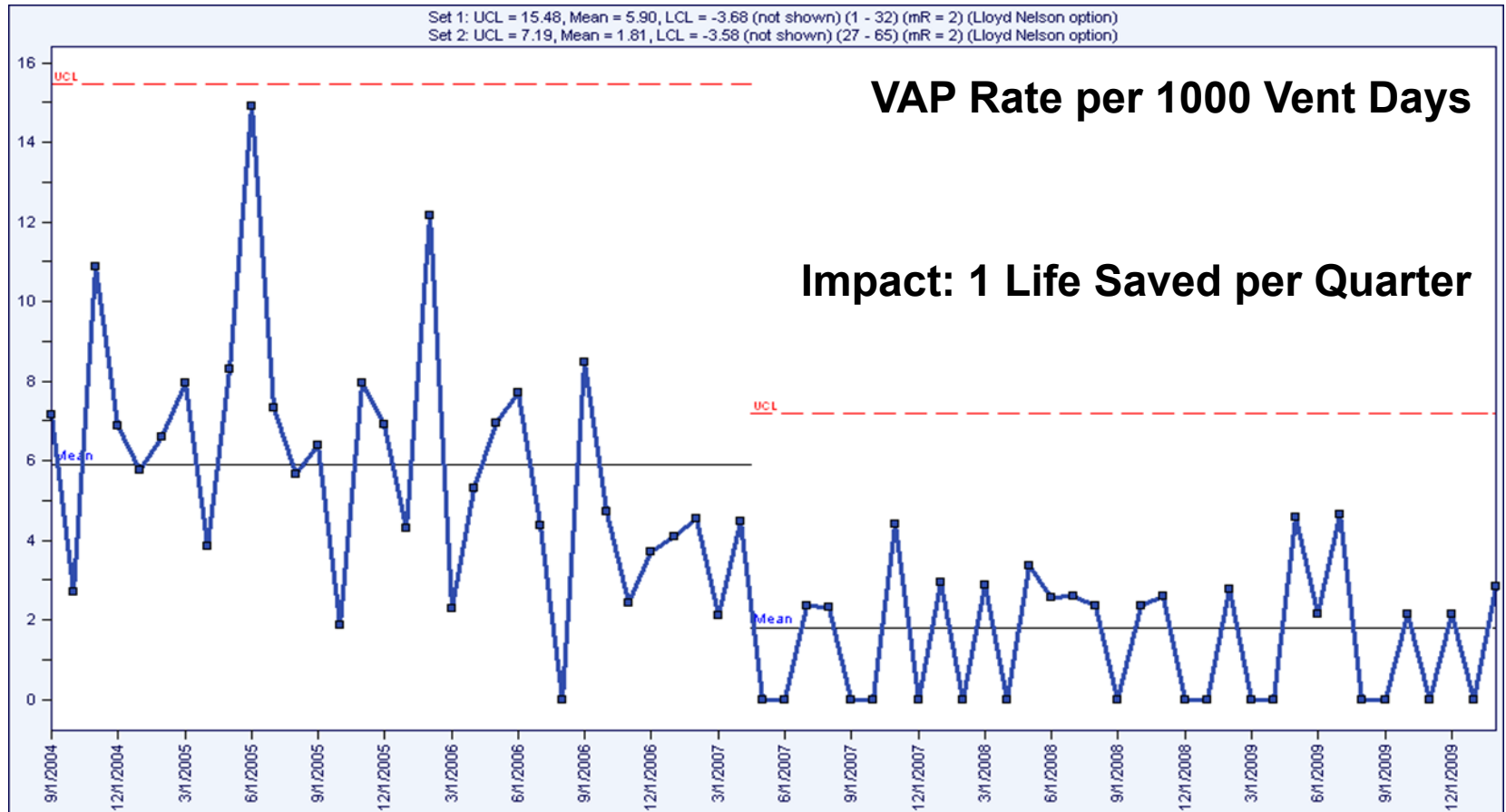
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Key Points

- Use Pareto thinking to understand what are the main contributors to the problem
- Display your data on a Pareto Chart to help others understand where they can have the most impact
- Focus on the “Vital Few” in your improvement efforts

Translate Numbers into Human Impact



Thanks to Dr. Chris Hayes,
St Michael's Hospital, Toronto

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To boldly go where you have never gone before...



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