

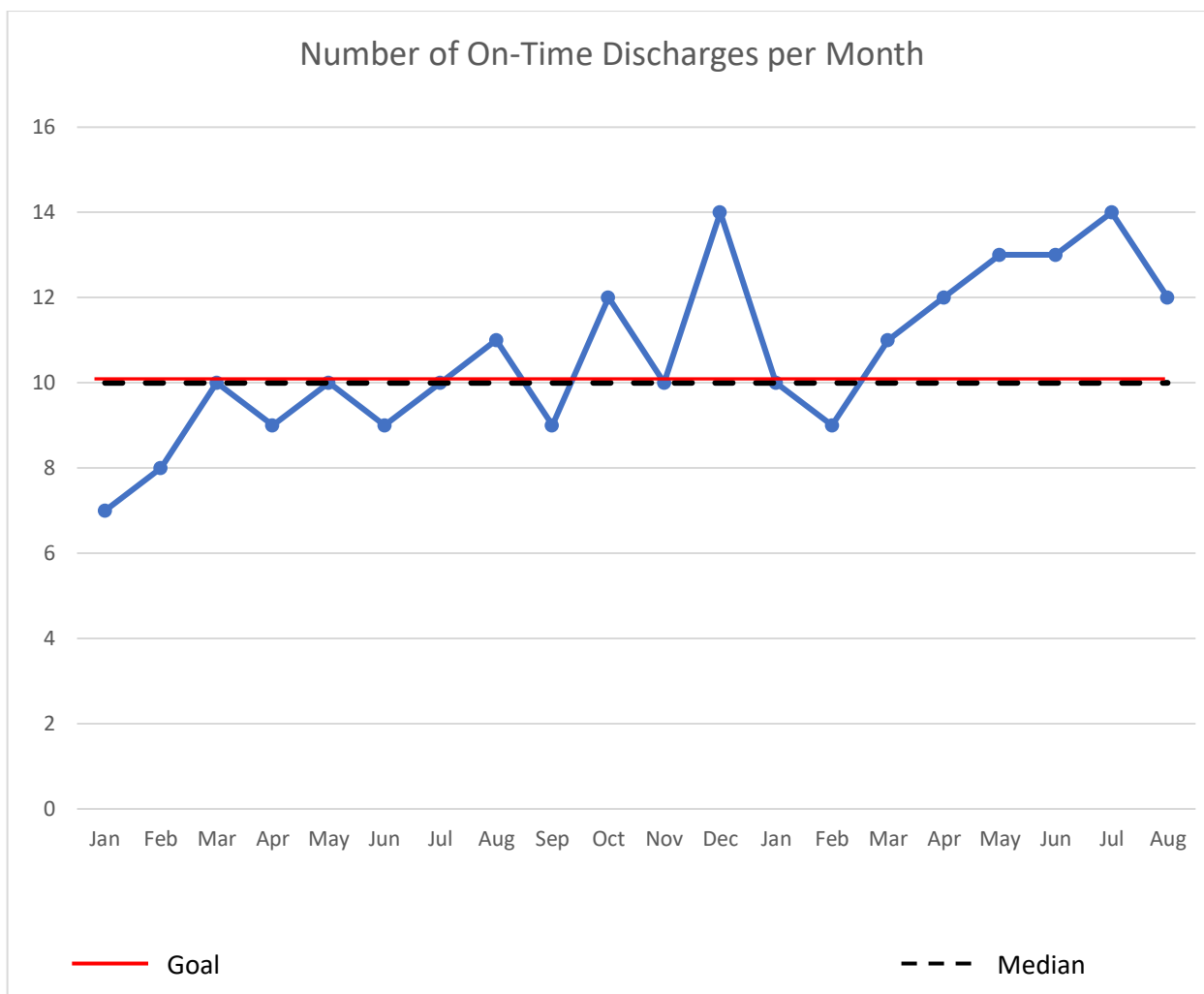
Run Charts

Run charts are simple displays of data that improve your ability to analyze and communicate your data. Run charts allow you to:

- Visualize the performance of your process
- Determine whether changes you made to your process resulted in an improvement
- Determine whether improvements introduced to your process are sustained

Constructing a Run Chart

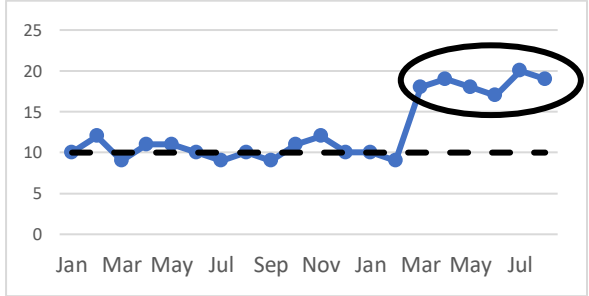
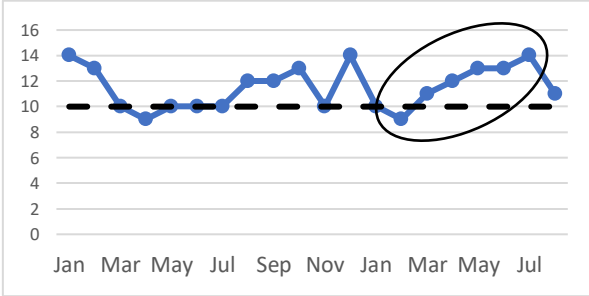
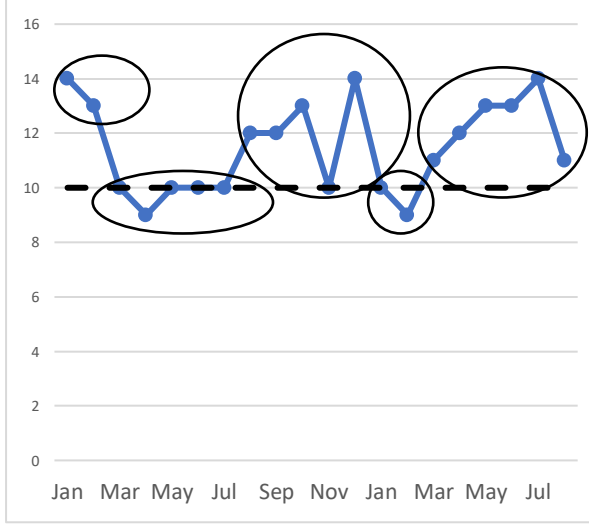
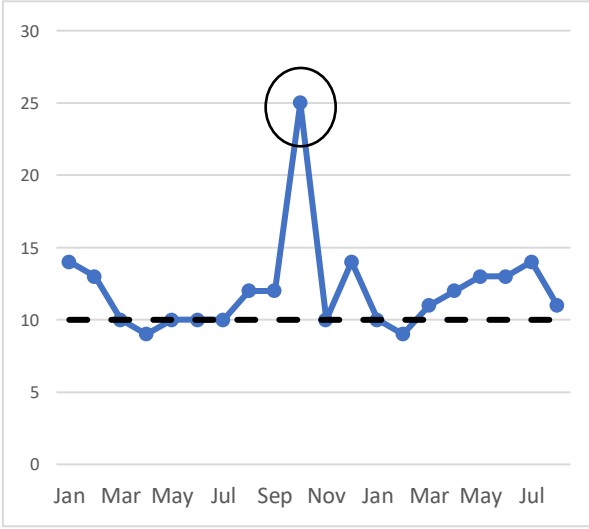
1. After choosing the question your Run Chart will answer, choose an appropriate time interval for the horizontal axis and scale for the vertical axis. A well-designed Run Chart is easy to read and gives insights into the data just based on visual inspection.
2. Plot your data points on your pre-determined axes.
3. Add a line representing the **median** of your data.
4. Add labels, title, and (if desired) a line for your aim or goal.



Handout created by Sam Porter, MD

Signals of Non-Random (Meaningful) Change

These tests of the data in a Run Chart can aid in interpreting whether a non-random change has occurred in your data if it is not obvious upon initial visual inspection.

<p><i>Probability of <5% (p=0.05) of occurring by chance</i></p> <p>Shifts Six or more consecutive points all above or all below the median (p = 0.03 for 6 points)</p> 	<p><i>Aids in visual inspection and interpretation, not based on statistical probabilities</i></p> <p>Trends Five or more consecutive points all increasing or decreasing</p> 
<p>Runs A run is a series of points on one side of the median. The trendline must cross the median before a new run begins. You can quickly calculate the number of runs by counting the number of times the trendline crosses the median and adding one. The number of runs in a series should be between a lower and upper limit determined by the number of data points in the data set. Any more, or any fewer, and the series is likely to be non-random. See next page for a reference table on upper and lower limits.</p> 	<p>Astronomical Data Points Data points that are obviously outside of normal variation. As a general rule, seek consensus from the team to determine whether a point is "astronomical" or just the high or low point in the data set.</p> 

Total Number of Data Points on Run Chart Not Falling on Median	Lower Limit of Number of Runs	Upper Limit for Number of Runs
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
36	13	25
37	13	25
38	14	26
39	14	26
40	15	27
41	15	27
42	16	28
43	16	28
44	17	29
45	17	30
46	17	31
47	18	31
48	18	32
49	19	32
50	19	33
51	20	33
52	20	34
53	21	34
54	21	35
55	22	35
56	22	36
57	23	36
58	23	37
59	24	38
60	24	38

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