**Data for Improvement: Run Chart Tools**

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| **Rules for Detecting Signals in Run Charts** |
| Shift | Six or more consecutive values all above or all below the medianIgnore values on the median |
| Trend | Five or more consecutive values all going up or going downIgnore repeating values |
| Run | Too few or too many runsRun: series of points in a row on one side of the median |
| Astronomical point | Unusually large or small value |

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| **Too Many or Too Few Runs on a Run Chart** |
| **# of Data Points Not on Median** | **Lower Limit for # of Runs** | **Upper Limit for # of Runs** |  | **# of Data Points Not on Median** | **Lower Limit for # of Runs** | **Upper Limit for # of Runs** |
| 10 | 3 | 9 |  | 30 | 11 | 21 |
| 11 | 3 | 10 |  | 31 | 11 | 22 |
| 12 | 3 | 11 |  | 32 | 11 | 23 |
| 13 | 4 | 11 |  | 33 | 12 | 23 |
| 14 | 4 | 12 |  | 34 | 12 | 24 |
| 15 | 5 | 12 |  | 35 | 12 | 24 |
| 16 | 5 | 13 |  | 36 | 13 | 25 |
| 17 | 5 | 13 |  | 37 | 13 | 25 |
| 18 | 6 | 14 |  | 38 | 14 | 26 |
| 19 | 6 | 15 |  | 39 | 14 | 26 |
| 20 | 6 | 16 |  | 40 | 15 | 27 |
| 21 | 7 | 16 |  | 41 | 15 | 27 |
| 22 | 7 | 17 |  | 42 | 16 | 28 |
| 23 | 7 | 17 |  | 43 | 16 | 28 |
| 24 | 8 | 18 |  | 44 | 17 | 29 |
| 25 | 8 | 18 |  | 45 | 17 | 30 |
| 26 | 9 | 19 |  | 46 | 17 | 31 |
| 27 | 10 | 19 |  | 47 | 18 | 31 |
| 28 | 10 | 20 |  | 48 | 18 | 32 |
| 29 | 10 | 20 |  | 49 | 19 | 32 |

*Perla et al, BMJ Qual Saf 2011;20:46-51.*