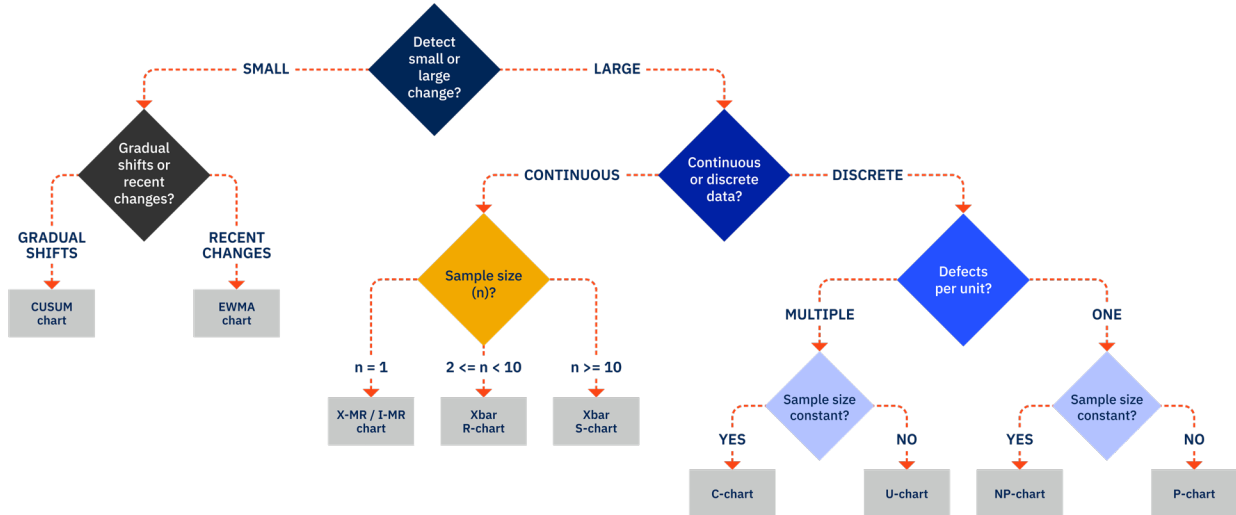


STATISTICAL PROCESS CONTROL CHARTS:

A QUICK GUIDE FOR CLINICIANS

SELECTING THE CONTROL CHART TYPE

CONTROL CHARTS are powerful tools for monitoring process stability and variability. Different types of control charts are suited for different types of data and scenarios. This document outlines the rules for selecting the appropriate control chart.



What are You Trying to Detect?

First, decide if you're looking for small, subtle process shifts or large, significant ones.

SMALL CHANGES (<1.5 SD from the mean)*:

- Want to catch slow, gradual drifts over time? → Use a **CUSUM Chart**.
- Want more sensitivity to recent data points? → Use an **EWMA Chart**.

LARGE CHANGES (>1.5 SD from the mean)*:

Proceed to: "What Kind of Data Do You Have?".

What Kind of Data Do You Have?

Next, identify your data type. Is it continuous or discrete?

CONTINUOUS DATA (e.g., weight, blood loss):

Check your sample size (n) for each subgroup.

- n = 1 (individual measurements) → Use an **I-MR Chart**.
- 2 ≤ n < 10 → Use an **X-Bar & R Chart**.
- n ≥ 10 → Use an **X-Bar & S Chart**.

DISCRETE (COUNT) DATA

(e.g., number of patient readmissions):

Can a single unit have multiple defects?

- | | |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| YES
Multiple Defects per Unit (e.g., number of mortalities) | Sample size varies? → Use a C Chart . |
| | Sample size constant? → Use a U Chart . |
| NO
One Defect per Unit (item is either defective or not, e.g., discharged with/without maternal milk) | Sample size varies? → Use an NP Chart . |
| | Sample size constant? → Use a P Chart . |

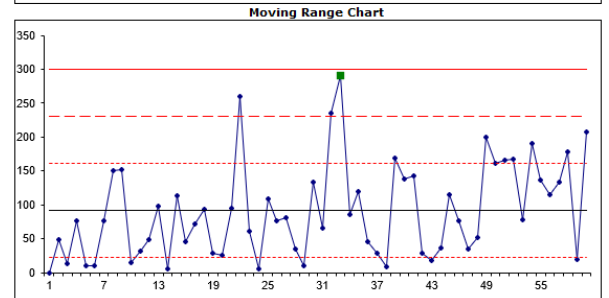
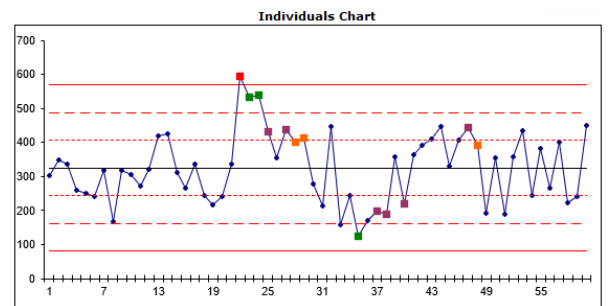
HOW TO INTERPRET A CONTROL CHART

Reading the Signals - Is Your Process Out of Control?

For information about how to create a control chart, see *Step 2* of the *Step-by-Step Guide*.

Look for these **four common signals** of a special cause variation that needs investigation**:

- 1** A single point outside the upper or lower control limits.
- 2** Two out of three consecutive points beyond the 2-sigma line (on the same side of the average).
- 3** Four out of five consecutive points beyond the 1-sigma line (on the same side of the average).
- 4** A run of eight or more consecutive points all on the same side of the average.



*The 1.5 SD threshold is a practical rule of thumb commonly used in SPC (Statistical Process Control) to distinguish small vs. large shifts.

**These are common SPC rules; institutions may use additional or alternative rules.

