**Transcript for Introduction to Control Chart**

These slides were organized by Farrokh Alemi. Control charts are a graphical display of data over time that can differentiate common cause variation from a special cause variation. Some variations are due to random chance events. We really should not care about them. On the other hand, other variations are due to special causes, and we need to understand how these events change the outcomes of care.

This slide shows a control chart. In a control chart, the measured characteristic is on the y-axis. The x-axis shows the time periods. There are usually two control limits in which the vast majority of data are expected to fall. The control limits are shown as red lines without markers. Observations are shown with markers. We want to compare the performance of these markers in different time periods against the control limits.

One or more data points above an upper control or below a lower control mark statistically significant changes in the process. Points between control limits are due to random chance variation. Here, the first marker is above upper control limit. The second time period marker is below the control limit. These points are unusual.

Generally, 25 data points are judged sufficient for constructing a control chart. One can use smaller time periods to have more data points. A long time frame may suggest a history that is not relevant is included in the analysis. The time period should not exceed major changes to the underlying process of care. Only history of current process is relevant.

Fewer cases may be used as an approximation. Few data points means less precision, wider limits. More data points means more delay, more money spent on data collection. A trade-off needs to be made between [INAUDIBLE] and less precision. Always keep in mind that the idea is to improve, not to prove.

These two charts show the idea of freezing and revising control limits. The chart on the left shows data out of control limits. We can freeze the history at the 10 time period and calculate separate control limits for the first 10 periods and another set of control limits for the second time periods. This allows us to see that the process was in control in the first 10 periods and changed afterwards.

A control chart can also show the intervention. Here, the vertical line shows the time period in which the integration was implemented. To understand if the intervention changed outcomes, you can select the limits either before or after the intervention. Select the pair of limits that are tighter. A tighter control limits occurs when the distance between the upper and lower control limits are smaller. Control charts tell a visual story on what happened pre and post-intervention.