MEASUREMENT FOR QUALITY IMPROVEMENT FOR BOARD MEMBERS AND EXECUTIVES

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COMMISSION

National Library of Australia Cataloguing-in Publication entry

Title: Measurement for Quality Improvement for Board Members and Executives

ISBN: 978-1-76000-682-2
SHPN: (CEC)170376
Subjects: Quality Improvement; Patient Safety; Measurement Tools

Suggested citation

Clinical Excellence Commission, 2017, *Measurement for Quality Improvement for Board Members and Executives*, Sydney, Australia: Clinical Excellence Commission

Clinical Excellence Commission

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FOREWORD

Ensuring safe, effective and patient centred care, while keeping patients free from avoidable harm is the ambition of any healthcare system.

Healthcare is complex and therefore understanding what influences safety and reliability of care is crucial to Boards. High performing Boards in healthcare understand the relationship between leadership, culture, accountability and quality improvement. The Board plays a key role in creating a positive organisational culture that supports frontline teams to do the right thing for patients and their carers.

Healthcare systems have historically reported on data for assurance, for performance and for improvement. Our reliance on organisational wide indicators, is in itself not enough to demonstrate our systems of care are reliable. Boards should seek to expect:

- Board reports that present realtime data and its analysis
- Data that describes trends and patterns in how care is delivered
- Triangulation of different data sets to ensure the Board understands the many variables influencing how the healthcare system is performing
- Less reliance on aggregated data and averages, more reliance on data at a facility and department level.

This guide has a practical emphasis and focuses on how measurement tools can assist Boards to set the right tone of assurance in patient safety. It also offers governance questions to assist Board debate and dialogue.

We invite Board Members to use this guide to support your journey in leading highly reliable organisations.

Carrie Marr

Chief Executive
Clinical Excellence Commission

QUESTIONS BOARDS SHOULD ASK ABOUT PATIENT SAFETY

Boards should be provided with (and ask for) data that allows them to understand the safety and quality of care for patients in their organisation, and should seek to understand what lies below the data – how the system is performing, outcomes for patients and families, where improvement is being made and where there is a need for increased focus.

It is important that Boards examine data over time, rather than aggregated averages or 'traffic light' indicators. Data over time enables Boards to understand whether there is change, and whether change is improvement.

Reviewing meaningful data representing quality and safety of care in the organisation over time, and asking questions about this data at every Board meeting, signals a Board's commitment as leaders in improvement.

Board members can identify gaps in their safety culture and work to improve it by answering seven key questions:

Question 1

Does everyone understand the importance of patient safety?

A clear and explicit view of patient safety is the foundation for setting goals and standards. Patient safety is everyone's responsibility and everyone needs to understand what it means for them.

Question 2

Do we really have an open and fair culture?

Staff are less likely to report errors or raise safety concerns if they are punished or blamed. Most errors are as a consequence of weaknesses in the system which then affect the performance of the individuals within that system.

Question 3

Are we actively encouraging reporting of incidents?

Organisations that report more incidents usually have a better and more effective safety culture. We can't learn and improve if we don't know what the problems are.

Question 4

Do we get the right information?

Learning from all sources of data together provides an organisation with a true reflection of where things are going wrong and what is needed to prevent minor incidents from becoming more major and serious incidents.

Question 5

Are we always open when things go wrong?

Communicating effectively with patients and their carers is a vital part of dealing with errors or problems in their treatment.

Question 6

Do we learn from patient safety incidents?

The response system is always more important than the reporting system. A robust methodology should be in place to ensure incidents are thoroughly investigated so that all contributing factors and root causes are identified and any recommendations are implemented successfully.

Question 7

Are we actively implementing recommendations and safety alerts?

A resilient organisation strives to continuously improve safety practices rather than being content to keep one step ahead of regulatory sanctions. It is vital to learn lessons from outside the organisation as well as from local information.

SEEKING TO UNDERSTAND REPORTS ON QUALITY IMPROVEMENT WORK

In addition to understanding the data provided to them, Boards should apply a similar lens when reviewing Board reports which describe efforts to improve quality. Such reports might include local improvement projects and initiatives, development or change of processes or models of care, new clinical protocols and pathways, purchasing of new equipment, and many others. This work may be undertaken at small or large scale.

When reviewing proposals or progress reports for this work, Boards can apply an importance governance lens to efforts in continuous improvement, through their knowledge and expertise in:

- the context and current state of quality improvement and safety in the organisation
- how the prevailing practice in the organisation stands up to best practice
- how board members can effectively leverage their roles and experiences to affect the pace of quality improvement in the organisation
- determining the best strategies to sustain the gain and drive continuous improvement.

Quality Improvement Checklist

What are we trying to accomplish?

- ☑ Does the project relate to the organisation's strategic plans/objectives?
- ☑ Does the project clearly state the need for improvement?
- ☑ Is the impact on the patient or other customer clear?
- ☑ Is there a clear project goal, which includes expected outcomes, impacts, and timeframe?
- ☑ Are specific numerical goals described?
- ☑ Is the timeframe realistic?
- ☑ Does the improvement team include: are subject matter experts with detailed knowledge of the targeted system; people with authority to make change; patients and consumers?
- ☑ What might cause this project to fail?

How will we know a change is an improvement?

- ☑ Are outcome, process, and balancing measures specified (refer to page 5)?
- ☑ Do these measures directly relate to the project objectives and goals?
- ☑ Is data on the historical or current performance of the process provided (baseline)?
- ☑ Is the work on track to achieve the objectives?
- ☑ Do we understand what caused any trends in the data?
- ☑ Do we know how many patients the data represents?
- ☑ Does the data suggest any regulatory or compliance issues are in play?

What changes can we make that will lead to improvement?

- ☑ Is a set of proposed changes, or a plan to create one, described?
- ☑ Is best practice identified? Who is the best in the world?
- ☑ Are specific issues to investigate and/or alternatives to consider given?
- ☑ Are constraints and boundaries defined, including what is out of scope?
- ☑ Is an iterative rapid cycle testing approach evident?
- ☑ Is the impact of each test of change measured (for example, annotated on a chart)?
- ☑ Is the project sustainable and spreadable?

QUALITY IMPROVEMENT CONCEPTS

Quality Planning, Assurance and Improvement

As Boards seek to understand their organisations' performance in safety and quality of care, there are key concepts which are important to understand in relation to quality improvement. One of these is the difference between Quality Assurance & Quality Improvement.

Quality Assurance focuses on monitoring the system of production for stability (through data), detecting emerging problems and taking steps to address them, and is about ensuring that a process remains stable over time. When gaps are detected between expected and observed performance, a Quality Improvement approach may be undertaken to close the gap.

In *Quality Improvement*, a variety of methods and tools are used to develop, test, and implement changes, and if needed redesign the relevant processes.

Following successful improvement, *Quality Assurance* is then used to monitor the redesigned process to ensure it performs at its new level.

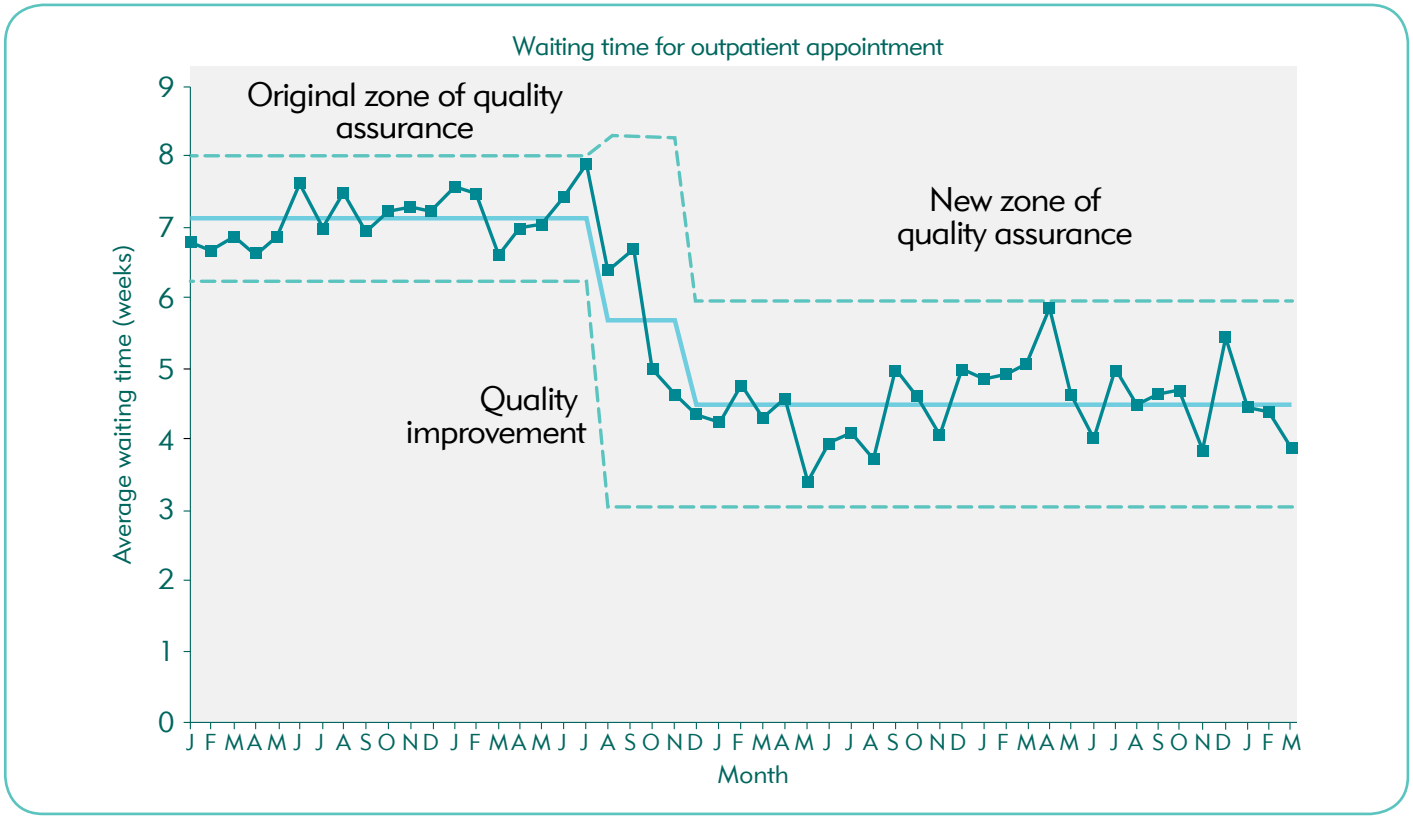


Figure 1: Quality Assurance and Quality Improvement

The Model for Improvement

The Model for Improvement, promulgated widely by the Institute of Healthcare Improvement, asks three key questions to guide improvement efforts:

1. **What are we trying to accomplish?**
2. **How will we know a change is an improvement?**
3. **What changes can we make that will lead to improvement?**

These questions are supported by the Plan-Do-Study-Act cycle, which is used for rapidly testing change ideas in the system.

The data provided to Boards should enable them to understand all three questions.

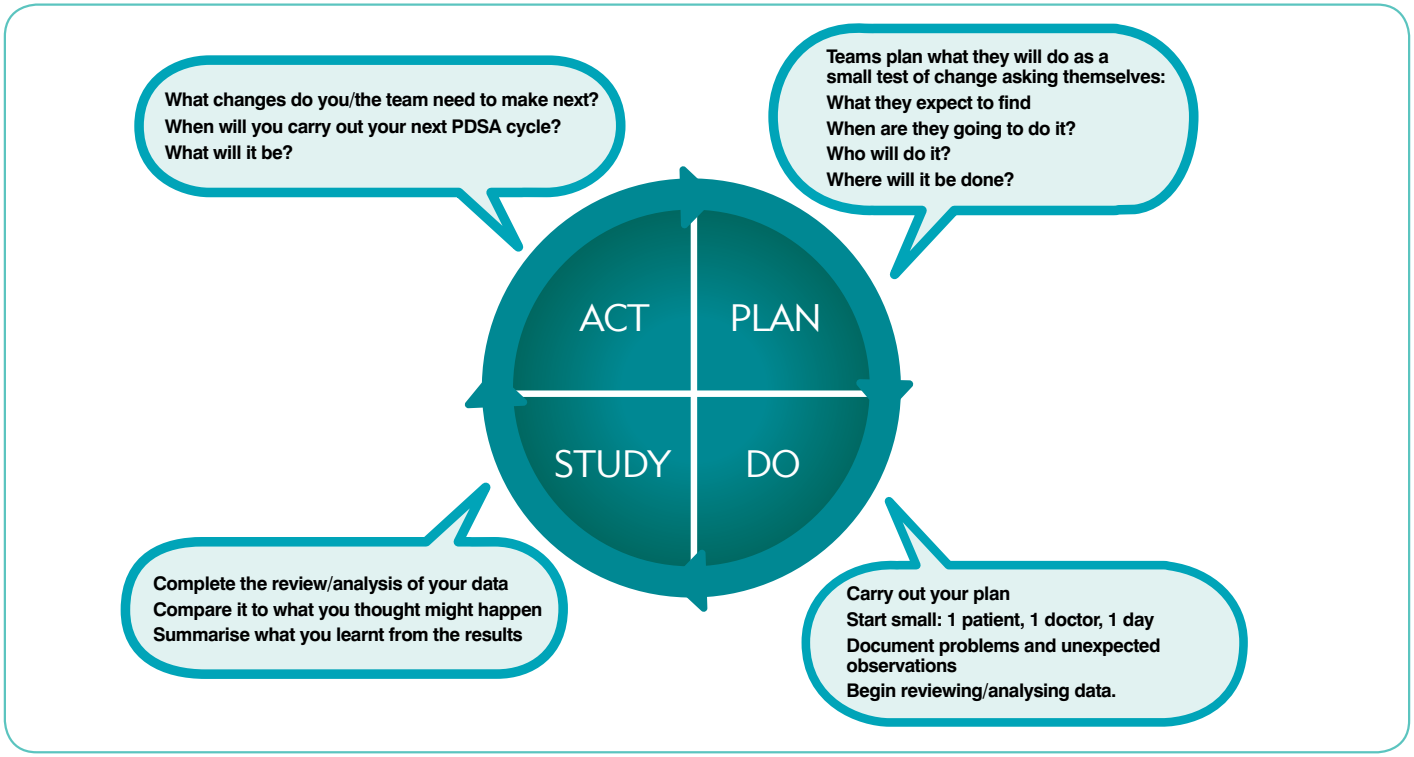


Figure 2 – Plan-Do-Study-Act cycle

Repeated PDSA Cycles – the "Ramp"

Continuous rapid tests of change through the Plan–Do–Study–Act (PDSA) cycle enable improvement teams to test change ideas under a variety of conditions and build knowledge sequentially over time. This helps build the degree of belief that the change will result in improvement, and allow testing to increase in scale before moving towards implementation. Multiple "ramps" associated with different change ideas may occur together.

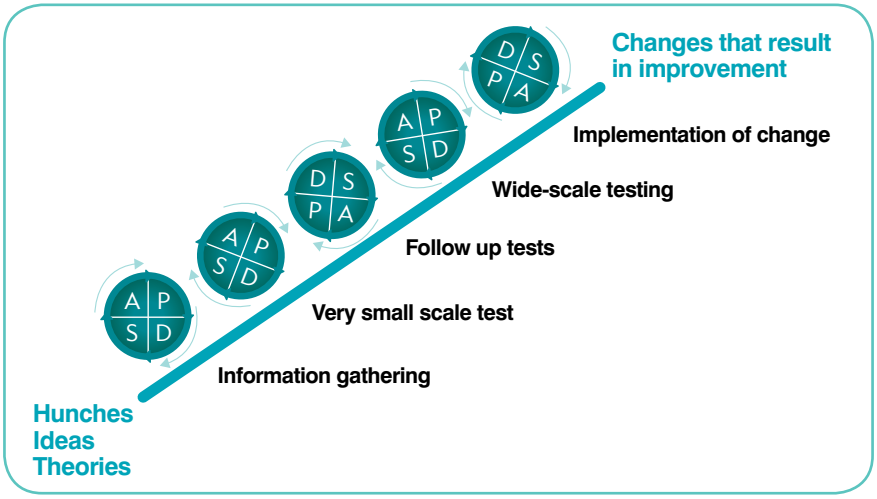


Figure 3 – The ramp

Measures for improvement
Family of Measures

Health care systems are very complex, and therefore any single measure as sole means of determining improvement is inadequate. Multiple measures are usually necessary to better evaluate the impact of changes on the many facets of system and typically efforts will require a "family" of measures of three different kinds:

Outcome Measures represent effect of the system on the patient or stakeholder: How is the system performing? What is the result?

Example: Surgical site infection rate

Process Measures relate to the workings of the system that contribute to the intended outcome: Are the parts/steps in the system performing as planned?

Example: Proportion of patients receiving appropriate antibiotics pre-surgery

Balancing Measures look at a system from different dimensions, considering impact elsewhere: What happened to the system as we improved the outcome and process measures? Were there unanticipated consequences?

Example: Antibiotics not ceased in a timely way

Figure 4 – Family of Measures in a dashboard

MEASUREMENT TOOLS FOR IMPROVEMENT OVER TIME

Improvement takes place over time. Determining if improvement has really happened and if it is lasting requires observing patterns over time.

Run charts

Run charts are graphs of data over time and are one of the single most important tools in performance improvement.

Using run charts:

- helps improvement teams formulate aims by depicting how well (or poorly) a process is performing
- helps in determining when changes are truly improvements by displaying a pattern of data
- They give direction about the value of particular changes – annotations on the chart assist here.

Run charts may be displayed in a series of "small multiples" using the same measure and scale for comparison (of individual services, for example) or with multiple measures in a single chart.

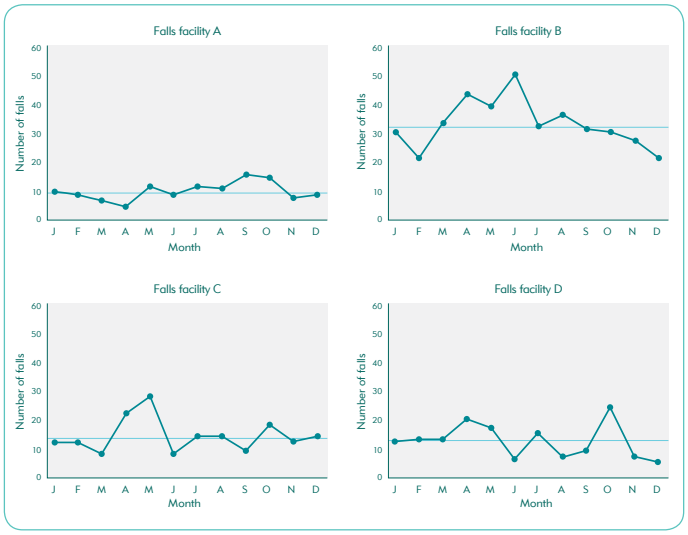


Figure 5 – Run charts: small multiples showing number of falls in 4 different facilities

In the example shown in Figure 5, the Board might ask "Is there a reason why facility B has a very different rate of falls – is this related to size of facility, patient mix, or less reliable falls management processes?"

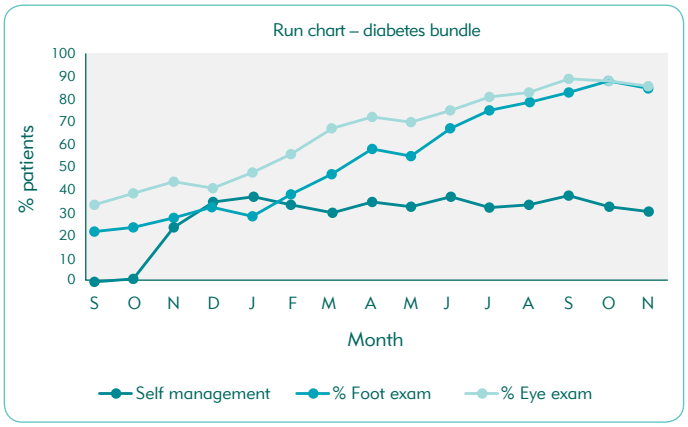


Figure 6 – Run charts: small multiples, showing and comparing 3 different aspects of diabetic care

In analysing run charts, there are four "non-random signals of change" which can be identified in the data to understand whether improvement is occurring. See example in Figure 7.

Shift: 6 or more consecutive points all above or below median (skip values on median)

Trend: 5 or more consecutively up or down (skip successive like values)

Too many/few runs: Runs are lines of data wholly on one side of the run chart's median line, and the number expected in random variation is predictable. Too few or too many runs may indicate change

Astronomical data point: one data point clearly outside the pattern.

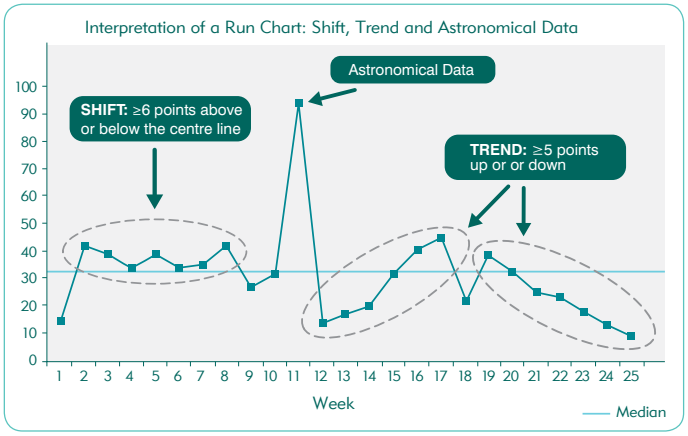


Figure 7 – Rules for identifying non–random signals of change in run charts

Control charts

Control charts, like run charts, are time-series charts. Depending on the type of data, a particular type of chart is used, with a centre line and upper and lower control limit marked on the chart. These lines are used to distinguish between common and special cause variation, which determines the most appropriate improvement approach.

Common Causes are those that are inherent in a system over time, affecting everyone working in the system and all outcomes of that system. They indicate a stable process that is *in statistical control*.

If the performance of a stable process is considered to require improvement, interventions will seek to change the system to achieve different results, and establish new control limits for quality control.

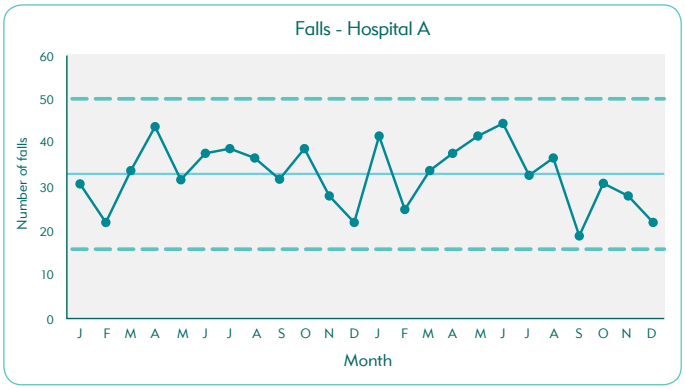


Figure 8 – A control chart showing common cause variation (system in statistical control)

The control chart above shows common cause variation in the falls rate: that is, the system is stable and performing as well as can be expected. A Board may ask "Is this good enough?" and "how can we narrow the gap between the upper and lower lines?"

If a need for improvement is identified, interventions will need to focus on changing the system, through rapid cycle PDSA, to achieve different results.

Special Causes, in contrast, are *not* part of the system all the time, but arise because of specific circumstances, and indicate an unstable system which is *not in statistical control*.

The improvement approach in this case is to identify when special cause occurred and why; if positive, improvement efforts may seek to replicate that event as a part of the system, while negative special cause may be the subject of attempts to eliminate the possibility of recurrence and bring the system into statistical control.

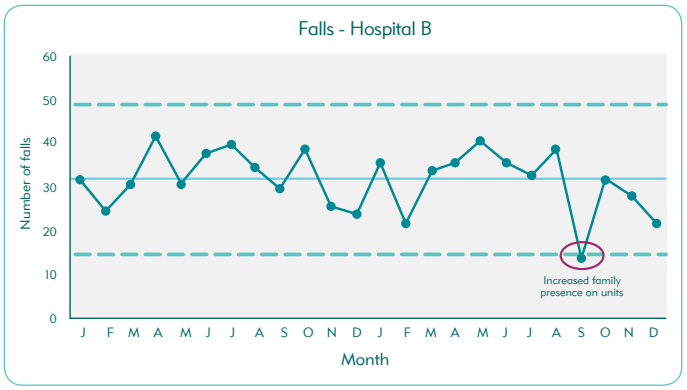


Figure 9 – A control chart showing special cause variation (a point outside the lower control limit)

Figure 9, on the other hand, shows special cause in the falls rate, in this case representing improvement. A Board should seek to understand why this occurred, and whether that improvement can be replicated to improve the system overall. Typically, subject matter experts can identify the reasons for special cause.

In Figure 9, an annotation has been added and information provided to the Board that the special cause variation was related to an increased presence of relatives and carers in the hospital at lunchtime that month. It may be worth considering adopting the practice of asking relatives and carers of patients at risk of falls to visit at these times.

There are five rules for identifying special cause in control charts to understand whether improvement is occurring:

1. A single point outside the control limits
2. Eight or more consecutive points above or below the centre line
3. Six consecutive points increasing (trend up) or decreasing (trend down)
4. Two out of three consecutive points near a control limit (outer one-third)
5. Fifteen consecutive points close to the centre line (inner one-third).

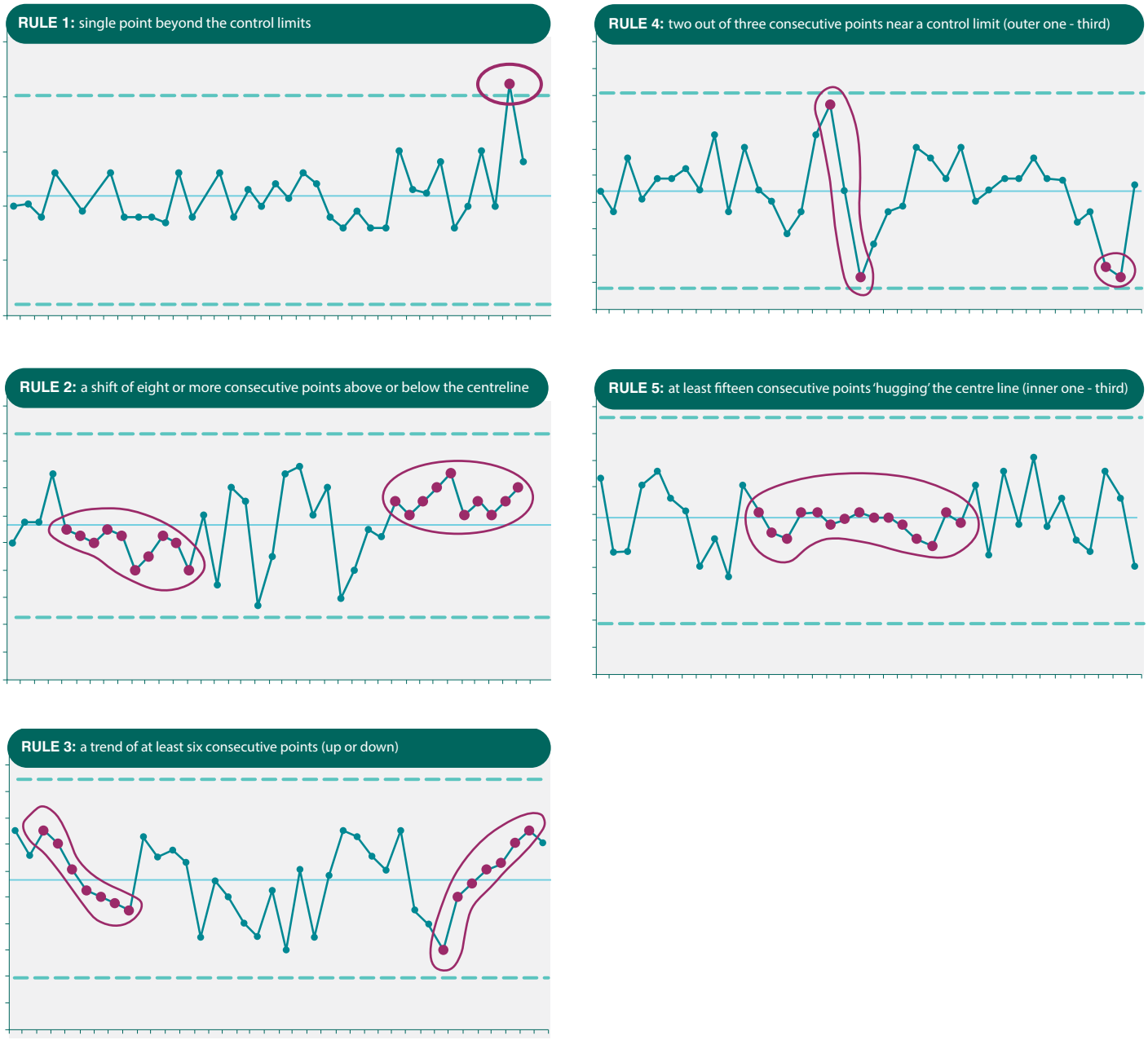


Figure 10 – Rules for identifying special cause variation

Funnel plots

Funnel plots are a special type of control chart that, rather than providing a view of data over time, plots control limits based on the size of the sample. This is useful when there is a wide variation in sample sizes between entities, for example when reviewing infection rates for hospitals of very different sizes and activity.

In the example shown in Figure 11, the horizontal axis shows the size or activity of a hospital and the vertical axis shows the measure under review (infections. A hospital with a high level of activity and a low infection rate (at that point in time) would be plotted in the lower right quadrant, while a smaller facility with a high rate would be plotted in the upper left quadrant. Those hospitals sitting outside the control limits have results outside expected levels and may represent examples of better practice or need for improvement.

In the case of the funnel plot above, a Board might ask "What is it that the 'green hospitals' do that the 'red hospitals' don't that might impact on mortality? What can we learn from them?"

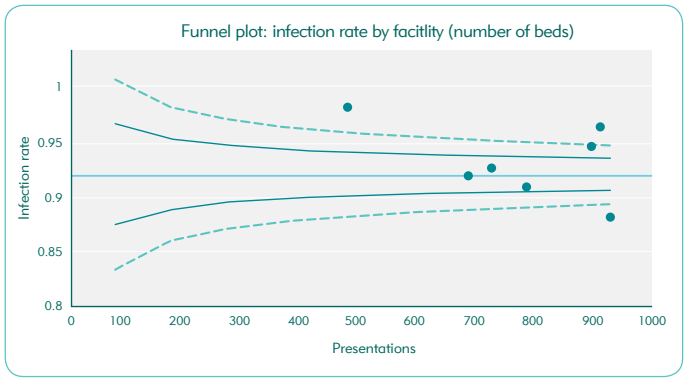


Figure 11 – Funnel plot of infections vs. activity (presentations)

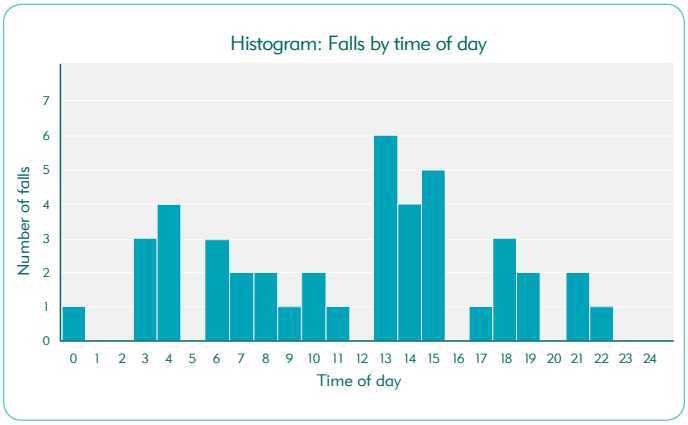
OTHER TOOLS USED TO MEASURE VARIATION FOR QUALITY IMPROVEMENT

Histogram

Often, summary statistics alone do not give a complete and informative picture of the performance of a process. A histogram is a special type of bar chart used to display the variation in continuous data like time, weight, size, or temperature.

A histogram enables a team to recognize and analyse patterns in data that are not apparent simply by looking at a table of data, or by finding the average or median.

This can help direct improvement efforts: for example, if falls on a ward are found to be most frequent between the hours of 1 and 3 in the afternoon, a change idea might be to increase patient rounding at this time.

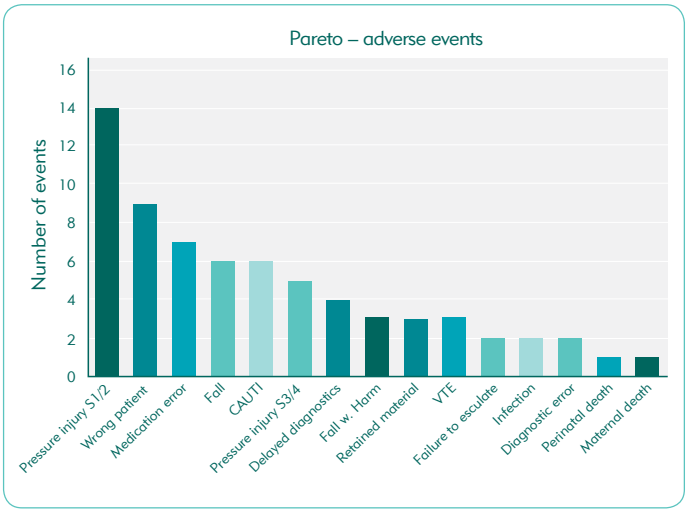


Pareto

According to the "Pareto Principle", in any group of things that contribute to a common effect, a relatively few contributors account for the majority of the effect.

A Pareto diagram is a type of bar chart in which the various factors that contribute to an overall effect are arranged in order according to the magnitude of their effect.

This ordering helps identify the "vital few" (the factors that warrant the most attention) from the "useful many" (factors that, while useful to know about, have a relatively smaller effect). Using a Pareto diagram helps a team concentrate its efforts on the factors that have the greatest impact.



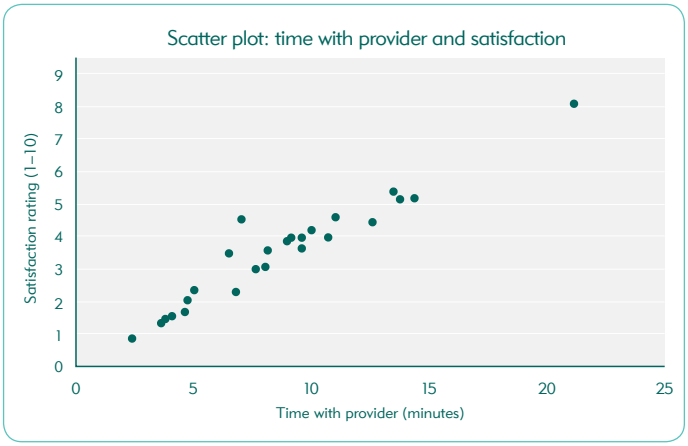
Scatterplot

A scatterplot uses coordinates to display values for two variables for a set of data, to indicate their relationship (also known as a correlation). Using scatterplots allows us to:

- move beyond analysis of a single variable
- assess whether there is a relationship between two variables
- understand the direction and strength of the relationship.

This analysis can assist in considering change ideas which can influence the intended outcome.

It is important to note that, while scatterplots help us to understand relationships between variable, they do not prove a cause and effect relationship.



REFERENCES AND USEFUL RESOURCES

1. Juran, J. M. (1989) *The Quality Trilogy: A Universal Approach to Managing for Quality. Juran Institute*, Inc., Wilton, CT
2. Institute for Healthcare Improvement *Science of Improvement: How to Improve* http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementHowtoImprove.aspx
3. Provost, L.P & Murray, S.K (2011) *The Health Care Data Guide*. Wiley

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