Quality Care Pharmacy Program

An initiative of The Pharmacy Guild of Australia

Supporting Excellence in Pharmacy

QUALITY TOOLS FOR EXCELLENCE IN PHARMACY

Skilful use of CQI is a powerful tool in today's competitive environment to develop your market niche or unique service quality position. However, it's not uncommon when starting with a quality program (in any industry) for people to use a quality assurance or "tick and flick" approach. Too often, just before the QCPP Assessor is due there is a flurry of activity to make sure all is in order on the day of assessment. This usually results in short term gains or small improvements.

As you know, the QCPP provides a structure for continuously improving all aspects of practice and your pharmacy. Because customers' needs change and business and professional practice evolves, many pharmacists have discovered that QCPP is of greatest value when woven into the day-to-day running of the pharmacy.

The pharmacies that make the most of QCPP do so by not treating quality management as an annual or one-off task. They use information to continually assess and change the way they do business to achieve benefits for staff, customers and their business viability. They have entrenched systems for ongoing improvement into every part of their business. They know the value of trained staff and good systems and the way these actions flow to improved customer outcomes, customer loyalty, staff satisfaction and business profitability.

QCPP is investing in resources by developing and adapting CQI tools specifically for community pharmacy to assist pharmacies in their journey of ongoing improvement. These Quality Improvement Tools have been tried, and tested, in a wide range of situations in Australia and internationally, and we strongly recommend that you review and adapt the tools and use them to improve the products and services offered in your pharmacy.

CQI TOOL 1: CAUSE AND EFFECT DIAGRAMS

also known as *Ishikawa* or *Fish Bone* diagram

CQI TOOL 2: PARETO CHARTS

CQI TOOL 3: HISTOGRAMS

CQI TOOL 4: CONTROL CHART

CQI TOOL 5: RUN CHART

CQI TOOL 1: CAUSE AND EFFECT DIAGRAMS

The Cause and Effect diagram is a problem-solving tool that helps identify multiple causes of a single error or problem. The diagram is used to illustrate and group theories regarding the various possible "causes" of a given effect either positive or negative by sorting out and relating the causes. That is, it helps to sort out the relationship between some "effect" and some possible "causes".

The technique looks to cure the cause not the symptoms of the problem. The technique helps identify the origins of problems, but does not distinguish between the different causes and does not indicate which are more important. It is a useful tool to use to involve people and allow them to gain ownership of a Quality Improvement project. Brainstorming ideas about possible causes of the effect is part of this technique.

The Cause and Effect Diagram is used to identify many possible causes for an effect or problem. It works best as a team tool, as it can be used to structure a brainstorming session. It immediately sorts ideas into useful categories. The shape of the cause and effect analysis is used to group the causes under suitable headings and to add logic to the analysis.

Categories that are used to sort out and relate the causes of the effect/problem that is being examined include:

- Policies,
- Procedures
- People
- Plant (& equipment)
- Manpower,
- Methods
- Materials

In service industries such a pharmacy the five P's of people, places, policies, processes and procedures are often used.

When to use a Cause and Effect Diagram:

- When identifying possible causes for a problem.
- When a team's thinking tends to fall into ruts.
- Materials needed: flipchart or whiteboard, marking pens.

Procedure:

- Agree on a problem statement (effect). Write it at the right of the flipchart or whiteboard. Draw a box around it and draw a horizontal arrow running to it.
- Brainstorm the major categories of causes of the problem. If this is difficult use generic headings such as:

People (manpower)

- Places
- Policies
- Procedures
- Processes

Alternative headings could be:

- Methods
- Machines (equipment)
- People (manpower)
- Materials
- Measurement
- Environment

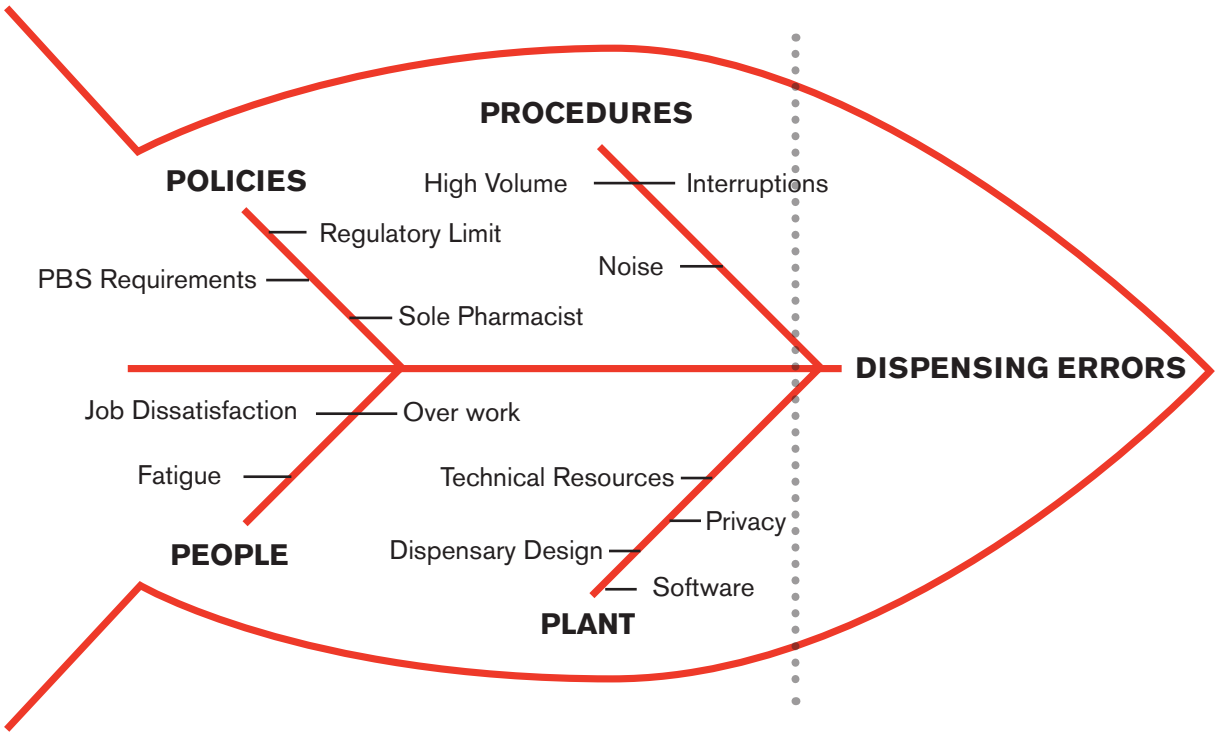
The inclusion of this tool on the QCPP website has been funded by The Australian Government Department of Health and Ageing as part of the Fourth Community Pharmacy Agreement.

CQI TOOL 1: CAUSE AND EFFECT DIAGRAMS (CONT.)

- Write the categories of causes as branches from the main arrow.
- Brainstorm all the possible causes of the problem. Ask: "Why does this happen?" As each idea is given, the facilitator writes it as a branch from the appropriate category. Causes can be written in several places if they relate to several categories.
- Again ask "why does this happen?" about each cause. Write sub-causes branching off the causes. Continue to ask "Why?" and generate deeper levels of causes. Layers of branches indicate causal relationships. Ask 5 times to get pat the symptom and down to the root cause.
- When the group runs out of ideas, focus attention to places on the chart where ideas are few.

The following example illustrates a Cause and Effect Diagram which was constructed after the incident register highlighted a spate of dispensing errors.

EXAMPLE CAUSE & EFFECT DIAGRAM



A Cause and Effect Diagram helps identify the origins of the problem but it does not distinguish between the different causes nor does it indicate which are more important. The standard tool to do that is a Pareto Chart.

CQI TOOL 2: PARETO CHARTS

The Pareto principle was named after an 18th century economist, Vilfredo Pareto. He studied the distribution of wealth in Europe at that time and found that 20% of the people held 80% of the wealth. The Parteo principle is known as the 80-20 rule and studies in this century into business by Dr J Juran have revealed that the Parteo principle often applies in business:

- 80% of a company's business in dollar terms comes from 20% of its customers
- 80% of waste is often accounted for by only from 20% of the causes

A Pareto Chart is a bar graph ordered so that the most frequently occurring cases are plotted first. The chart is used to separate the "vital few" causes of a problem from the "trivial many". The lengths of the bars represent frequency or cost (time or money), and are arranged with longest bars on the left and the shortest to the right. In this way the chart visually depicts which situations are more significant - the most frequently occurring factors are plotted first.

1. It gives a visual appreciation of the things that are most important in causing an effect so you "don't sweat the small stuff". It is based on the above premise of the 80- 20 rule that is; 80% of your problems come from 20% of the possible causes.

When to use:

- When analysing data about the frequency of problems or causes in a process.
- When there are many problems or causes and you want to focus on the most significant.
- When analysing broad causes by looking at their specific components.
- When communicating with others about your data.

Procedure

1. Decide what categories you will use to group items.
2. Decide what measurement is appropriate. Common measurements are frequency, quantity, cost and time.
3. Decide what period of time the Pareto chart will cover: One work activity cycle? One full day? A week?
4. Collect the data, recording the category each time. (Or assemble data that already exist.)
5. Subtotal the measurements for each category.
6. Determine the appropriate scale for the measurements you have collected. The maximum value will be the largest subtotal from step 5. (If you will do optional steps 8 and 9 below, the maximum value will be the sum of all subtotals from step 5.) Mark the scale on the left side of the chart.
7. Construct and label bars for each category. Place the tallest at the far left, then the next tallest to its right and so on. If there are many categories with small measurements, they can be grouped as "other."

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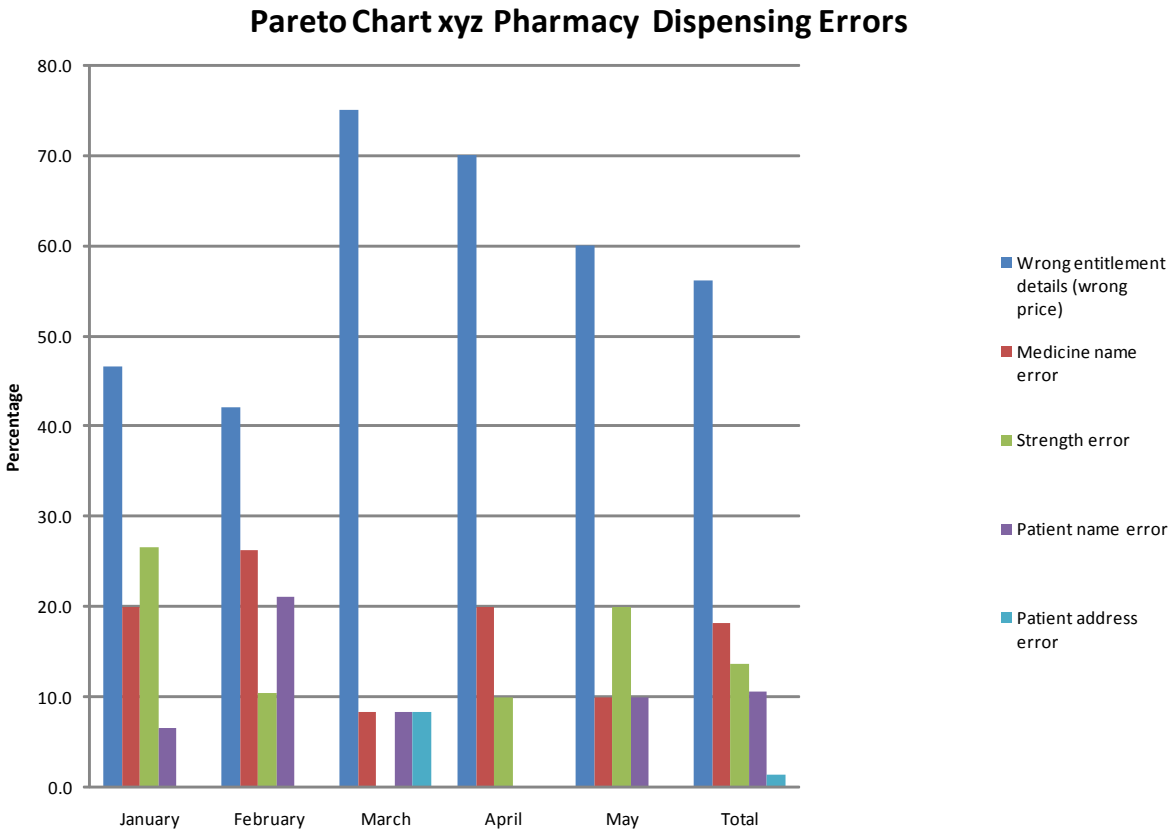
CQI TOOL 2: PARETO CHARTS (CONT.)

Steps 8 and 9 are optional but are useful for analysis and communication

8. Calculate the percentage for each category: the subtotal for that category divided by the total for all categories. Draw a right vertical axis and label it with percentages. Be sure the two scales match: For example, the left measurement that corresponds to one-half should be exactly opposite 50% on the right scale.
9. Calculate and draw cumulative sums: Add the subtotals for the first and second categories, and place a dot above the second bar indicating that sum. To that sum add the subtotal for the third category, and place a dot above the third bar for that new sum. Continue the process for all the bars. Connect the dots, starting at the top of the first bar. The last dot should reach 100 percent on the right scale.

The chart below shows how many dispensing errors were received in each of five categories.



This graph clearly suggests that the procedure relevant to 'recording customer entitlments' should be carefully examined, by the pharmacy.

CQI TOOL 3: HISTOGRAMS

A Histogram is a frequency distribution. A histogram is the most commonly used graph to show frequency distributions or how often each different value in a set of data occurs. It is constructed from grouped data. Grouped data is the number of observations (class frequencies) falling into classes or class intervals. For example surveys often group peoples ages or incomes into a "class" – 40 -50 years or $80,000 - $90,000. If 20 people that answered the survey were aged between 40 -50 years then the frequency for this interval is 20.

A Histogram looks very much like a bar chart, but there are important differences between them. Whereas, a Pareto Chart deals with characteristics of a product or service, a Histogram groups measurement data, e.g. response time. Banks offer service within five minutes and could use a histogram when monitoring their customer service standard. The shape of the distribution gives a visual display of process variability. The following Histogram shows the variation in customer waiting time for 3,114 prescriptions dispensed over a one week period. The class interval in this example is two minutes.

When to use

- When the data are numerical.
- When you want to see the shape of the data's distribution, especially when determining whether the output of a process is distributed approximately normally.
- When analysing whether a process can meet the customer's requirements.
- When analysing what the output from a supplier's process looks like.
- When seeing whether a process change has occurred from one time period to another.
- When determining whether the outputs of two or more processes are different.
- When you wish to communicate the distribution of data quickly and easily to others.

Analyse

- Before drawing any conclusions from your histogram, satisfy yourself that the process was operating normally during the time period being studied. If any unusual events affected the process during the time period of the histogram, your analysis of the histogram shape probably cannot be generalized to all time periods.
- Analyse the meaning of your histogram's shape.

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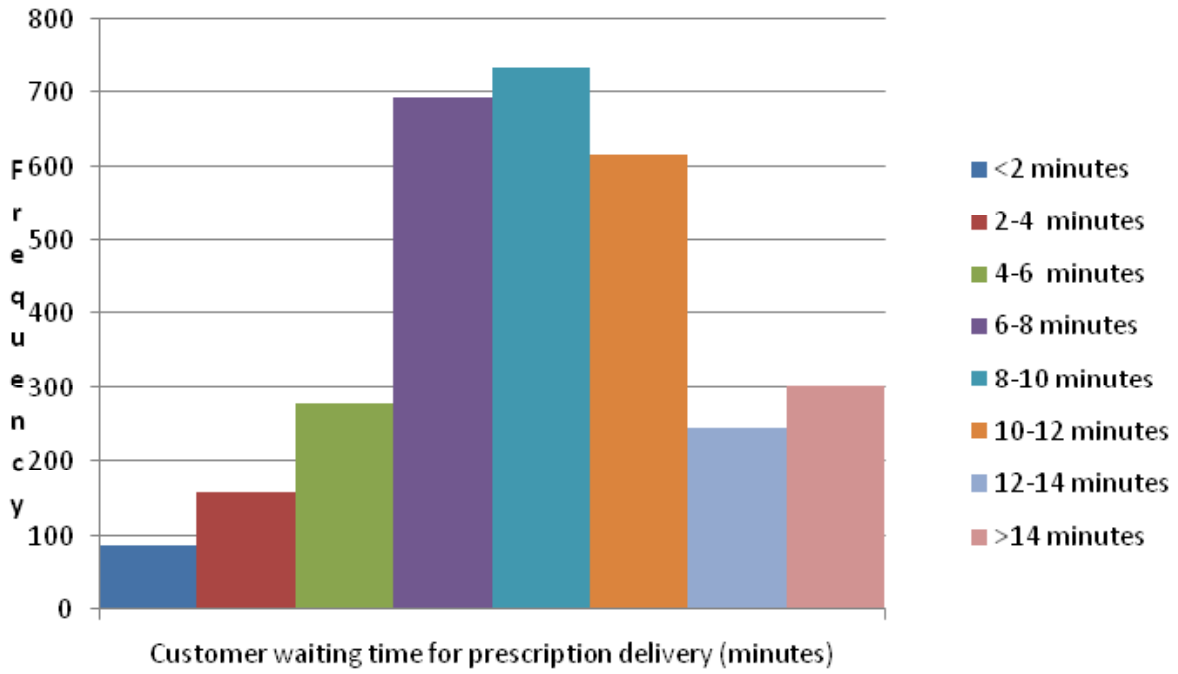
CQI TOOL 3: HISTOGRAMS (CONT.)

EXAMPLE HISTOGRAM



When constructing a Histogram the principles used are:

- Use non-overlapping classes as it removes ambiguity
- Try to have class intervals of equal length as this makes it easier to interpret
- Chose a reasonable number of classes – as a rough rule 5 or 6 classes are usually enough for 50 data points and 10-12 classes are needed for 150 (or more) data points

CQI TOOL 4: CONTROL CHART

A Control Chart is a graph used to study how a process changes over time. It can help to determine how much process variability is due to random variation and how much is due to unique events. It is as a visual representation of data used to monitor a process, demonstrate progress and to see if the long range average is changing.

Data in a Control Chart is plotted in time order with a central line for the average and an upper line for the upper control limit and a lower line for the lower control limit. These lines are determined from historical data. The upper and lower control limits may be used as a guide to point out when a process is outside of the limits. By comparing current data to these lines, you can draw conclusions about whether the process variation is consistent (in control) or is unpredictable (out of control, affected by special causes of variation) and when investigation may be required to determine why the process is not producing high quality results.

In other words, the upper and lower limits can be used to look at the spread of data around a "standard" in order to assess variability and as a measure of progress when attempting to raise a performance level.

When to use

- When controlling ongoing processes by finding and correcting problems as they occur.
- When predicting the expected range of outcomes from a process.
- When determining whether a process is stable (in statistical control).
- When analysing patterns of process variation from special causes (non-routine events) or common causes (built into the process).
- When determining whether your quality improvement project should aim to prevent specific problems or to make fundamental changes to the process.

When constructing a Control Chart the principles used are

- Choose the appropriate control chart for your data.
- Determine the appropriate time period for collecting and plotting data.
- Collect data, construct your chart and analyse the data.
- Look for "out-of-control signals" on the control chart. When one is identified, mark it on the chart and investigate the cause. Document how you investigated, what you learned, the cause and how it was corrected.

The maximum and minimum charting of the temperature on the vaccine refrigerator as required by QCPP standards is a typical control chart with the expected maximum of 8°C, a minimum of 2°C and a mean (mid-point) of 5°C.

Without upper and lower limits the chart is called a Run Chart

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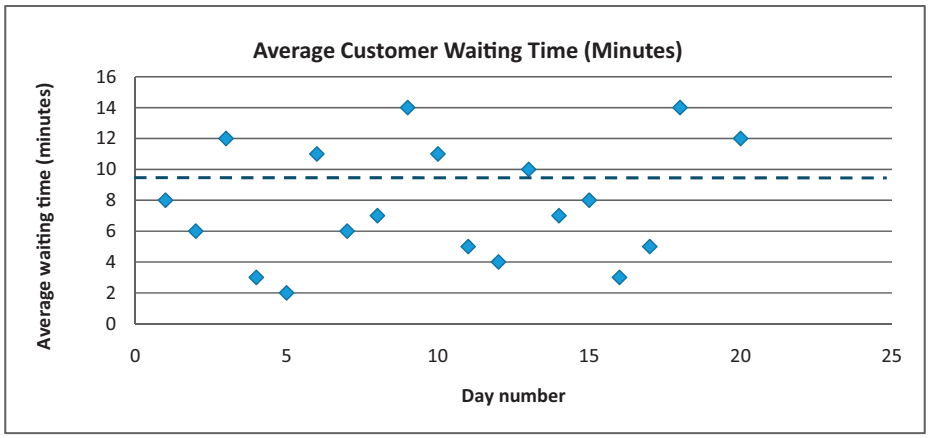
CQI TOOL 4: CONTROL CHART (CONT.)

EXAMPLE CONTROL CHART



CQI TOOL 5: RUN CHART

A Run Chart is used to study the behaviour of a single characteristic, to detect trends or patterns in data which may develop over a period of time. Typical uses of Run Charts are; sales per month, percentage error per time period or staff turnover. Run Charts are relatively easy to construct as most of us use them in our everyday life.

- The horizontal axis is always time related
- The vertical axis is the scale of measurement for the characteristic

Data is plotted and updated continually to keep track of the process over a period of time. The most valuable use of run charts is to identify meaningful trends or shifts in the average. For example if there was a nine point "run" on one side of the average it indicates a statistically unusual event and that the average has changed. Such changes should always be investigated. If the shift is favourable it should be made a permanent part of the system. If the shift is unfavourable, it should be eliminated. A daily record of takings placed on a graph is a Run Chart.

EXAMPLE RUN CHART