Health care quality tools

Quality tools help people understand and improve processes. There are many different tools, and the skill of quality professionals lies in their ability to take an application from one field or industry and apply it, or adapt it, to specific situations in other fields.

If you’re new to applying quality techniques in health care, don’t be scared off by the vast number of tools available, or the fact that the tools have roots in fields other than health care.

Take a look at the tools listed below, “test-drive” a couple, and soon you’ll begin discovering how to apply them to your unique situation.

Seven tools of quality improvement

The basic “seven tools of quality improvement” help organisations generate ideas; analyse, develop, and evaluate processes; and collect data.

1. Flowchart/process map—Graphical tools for process understanding. A flowchart creates a map of the steps in a process, and documents the inputs and outputs for each step.
2. Check sheet—A simple data-recording device, custom-designed by the user to allow for easy data collection and interpretation.
3. Cause-effect diagram—A tool for analyzing a process by illustrating the main causes and sub-causes leading to an effect (or symptom). Also called an "Ishikawa diagram" after its inventor, Kaoru Ishikawa, and the "fishbone diagram," because the complete diagram resembles a fish skeleton.
4. Pareto chart—A graphic tool for ranking causes from most significant to least significant. It’s named for economist Vilfredo Pareto, who said most effects come from relatively few causes: that is, 80% of the effects come from 20% of the possible causes.
5. Histogram—A graphical depiction of variation in a set of data. A histogram lets people see patterns that are difficult to detect in a simple table of numbers.
6. Control chart—A chart with upper and lower control limits on which values for a series of samples are plotted. The chart frequently includes a central line to help detect a trend of plotted values toward either control limit.
7. Scatter diagrams—A graphic technique for analyzing the relationship between two variables. Two sets of data are plotted as dots on a graph: Patterns in how the dots are dispersed can help determine if the variables are related.

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Flowchart  Also called: process flowchart, process flow diagram.

Variations: macro flowchart, top-down flowchart, detailed flowchart (also called process map, micro map, service map, or symbolic flowchart), deployment flowchart (also called down-across or cross-functional flowchart), several-leveled flowchart.

A flowchart is a picture of the separate steps of a process in sequential order.

Elements that may be included are: sequence of actions, materials or services entering or leaving the process (inputs and outputs), decisions that must be made, people who become involved, time involved at each step and/or process measurements.

The process described can be anything: a manufacturing process, an administrative or service process, a project plan. This is a generic tool that can be adapted for a wide variety of purposes.

When to Use a Flowchart

- To develop understanding of how a process is done.
- To study a process for improvement.
- To communicate to others how a process is done.
- When better communication is needed between people involved with the same process.
- To document a process.
- When planning a project.

Flowchart Basic Procedure

Materials needed: sticky notes or cards, a large piece of flipchart paper or newsprint, marking pens.

1. Define the process to be diagrammed. Write its title at the top of the work surface.
2. Discuss and decide on the boundaries of your process: Where or when does the process start? Where or when does it end? Discuss and decide on the level of detail to be included in the diagram.
3. Brainstorm the activities that take place. Write each on a card or sticky note. Sequence is not important at this point, although thinking in sequence may help people remember all the steps.
4. Arrange the activities in proper sequence.
5. When all activities are included and everyone agrees that the sequence is correct, draw arrows to show the flow of the process.
6. Review the flowchart with others involved in the process (workers, supervisors, suppliers, customers) to see if they agree that the process is drawn accurately.
Flowchart Considerations

- Don't worry too much about drawing the flowchart the “right way.” The right way is the way that helps those involved understand the process.
- Identify and involve in the flowcharting process all key people involved with the process. This includes those who do the work in the process: suppliers, customers and supervisors. Involve them in the actual flowcharting sessions by interviewing them before the sessions and/or by showing them the developing flowchart between work sessions and obtaining their feedback.
- Do not assign a “technical expert” to draw the flowchart. People who actually perform the process should do it.
- Computer software is available for drawing flowcharts. Software is useful for drawing a neat final diagram, but the method given here works better for the messy initial stages of creating the flowchart.
Flowchart Examples

High–Level Flowchart for an Order-Filling Process

Order receipt → Credit check → Inventory check → Production → Shipment → Billing

Detailed Flowchart

Order received

Enter order in system

Credit check

Is credit good?

No → Refuse order

Yes → Check inventory

Is product in inventory?

No → Check materials needed

Are materials in inventory?

No → Order materials

Yes → Schedule production

Schedule shipment

Continue delivery date with customer

Make product

Inspection product

Is product good?

No → Wait

Yes → Receive materials

Inspect materials

Are materials good?

No → Wait

Yes → Inspect materials

Vendor

Ship product

Prepare bill

Mail bill

**Pareto Chart**  Also called: Pareto diagram, Pareto analysis

Variations: weighted Pareto chart, comparative Pareto charts

A Pareto chart is a bar graph. 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.

**When to Use a Pareto Chart**

- When analyzing 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 analyzing broad causes by looking at their specific components.
- When communicating with others about your data.

**Pareto Chart 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 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.”

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.
Pareto Chart Examples

Example #1 shows how many customer complaints were received in each of five categories.

Example #2 takes the largest category, “documents,” from Example #1, breaks it down into six categories of document-related complaints, and shows cumulative values.

If all complaints cause equal distress to the customer, working on eliminating document-related complaints would have the most impact, and of those, working on quality certificates should be most fruitful.