NHS Improvement

ACT Academy

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Cause and effect (fishbone)

collaboration trust respect innovation courage compassion

Cause and effect (fishbone)

What is it?

Cause and effect analysis helps you to think through the causes of a problem, including possible root causes, before you start to think of a solution – not just symptoms. By identifying all possible causes and not just the most obvious, you can work towards removing the problem.

Working through cause and effect analysis enables those involved to gain a shared insight into the problem, develop possible solutions and create a snapshot of the team's collective knowledge.

When to use it

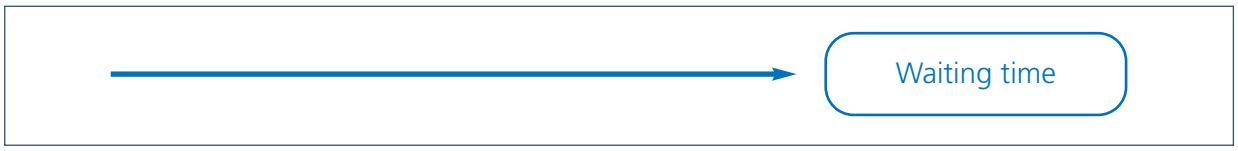
Use this tool when you are trying to determine why a particular problem is occurring. It will help you to fully understand the issue and to identify all the possible causes – not just the obvious.

How to use it

1. Identify the problem and consider it in detail: who is involved, when and where it occurs. Write the problem in a box and draw an arrow pointing towards it.

For example:

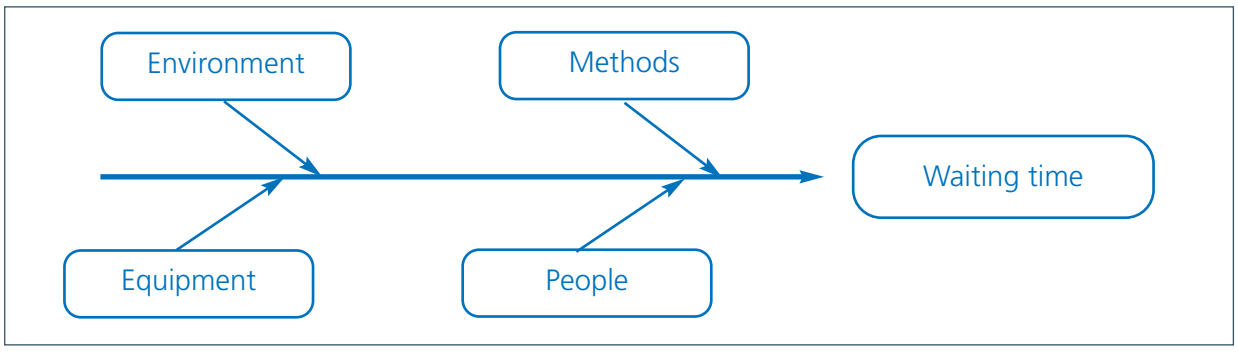
Figure 1. Identify the problem



2. Identify the major factors, draw four or more branches off the large arrow to represent main categories of potential causes and label each line. Categories could include: equipment, environment, procedures and people. Make sure the categories are relevant to your particular problem. Alternatively, you could use the **affinity diagram** technique and group headings.

For example:

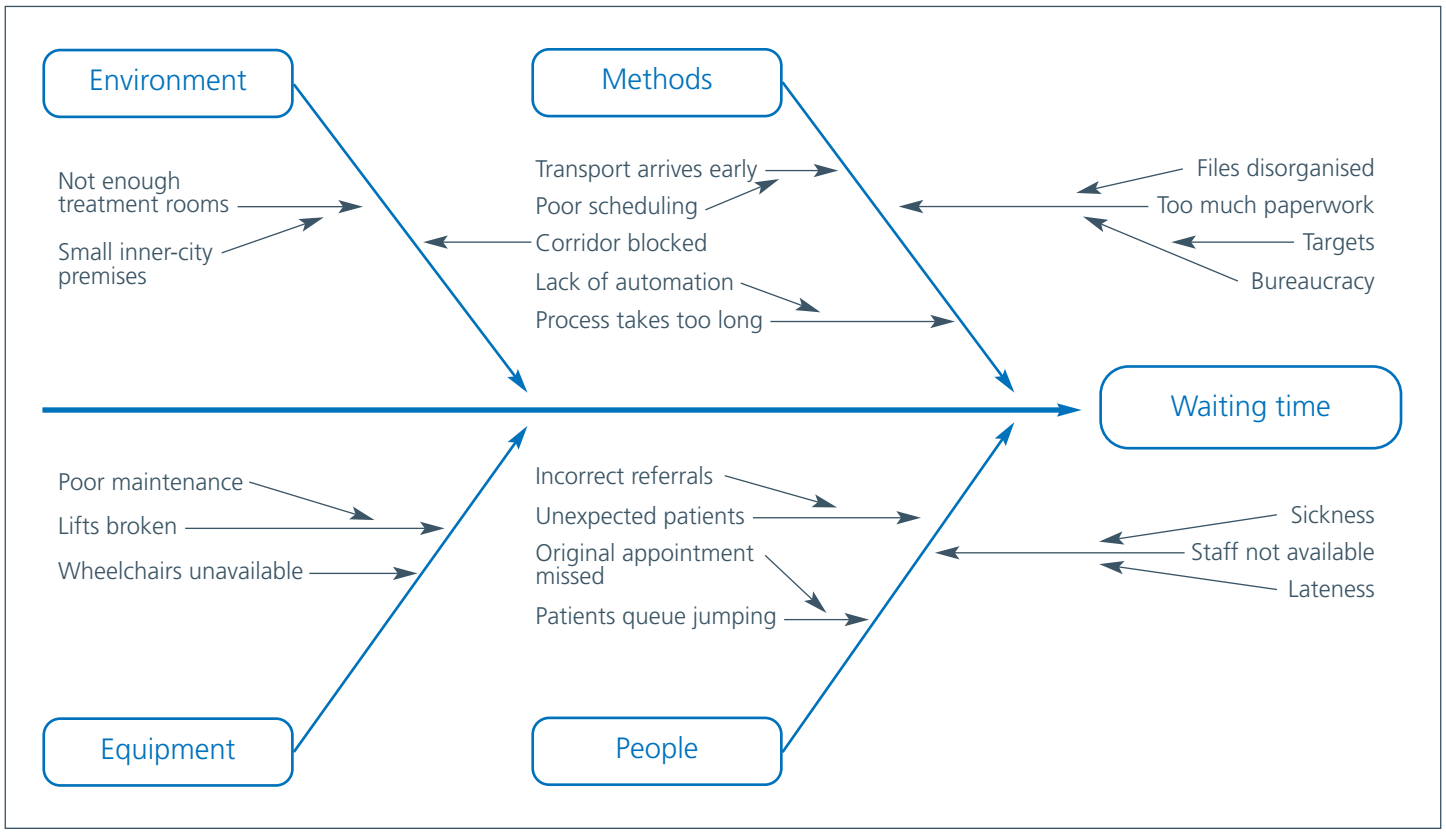
Figure 2. Identify the major factors



3. Take each of the main categories and brainstorm possible factors contributing to the problem. Explore each one to identify more specific 'causes of causes', adding and labelling more lines off the spine. Continue branching off until every possible cause has been identified. You might want to break complex causes into sub-causes. Show these as lines coming off each cause line.

4. Analyse your diagram. By this stage you should have a diagram showing all the possible causes of your problem. Depending on its complexity and importance, you can now investigate the most likely causes further. This may involve using more identification tools such as data check sheets, setting up interviews (see **patient stories**), carrying out **process mapping** or surveys that you can use to decide whether the causes identified are genuine and accurate.

Figure 3. Analyse your diagram



TIPS

- **Engage your team to agree the problem statement. Include as much information as possible in the 'what', 'where', 'when' and 'how much' of the problem. Use data to specify the problem if possible.**
- **Aim to construct the diagram with the people involved in the problem.**
- **You can use a cause and effect diagram as a working document that is updated as and when you collect more data, or to test possible solutions.**
- **Produce your diagram on paper so that it can be transported.**
- **Ideally, causes should appear in only one category, although some causes may overlap.**

Example

Bolton Hospital General Surgery team used cause and effect analysis and **root cause analysis using five whys** to identify the barriers to implementing their redesigned pathway for abdominal pain and how these barriers could be overcome.

You may also find **driver diagrams** a useful way of planning activities to solve problems.

Background

The cause and effect diagram is sometimes called a fishbone diagram (because the diagram looks like the skeleton of a fish) or an Ishikawa diagram (after Professor Kaoru Ishikawa of Tokyo University who invented it in 1968).

The cause and effect diagram was adopted by Dr W Edwards Deming as a helpful tool for improving quality. Dr Deming taught total quality management in Japan after World War ll. He also helped develop statistical sampling approaches for national census purposes in the USA and taught methods of quality management to the military. Both Ishikawa and Deming use this diagram as one of the first tools in the quality management process.

References

Ishikawa, K (1968) *Guide to Quality Control*, JUSE, Tokyo