Francis Report

NT RESPONSE

Fishbone analysis can be used to identify and solve problems, and assist staff to make changes to benefit both patients and staff

CHANGE MANAGEMENT TOOLS: PART 1 OF 3

Using fishbone analysis to investigate problems

In this article...
› **What is fishbone analysis?**
› **How this tool can be applied to clinical settings**
› **Case study of fishbone analysis being used in practice**

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Abstract Phillips J, Simmonds L (2013) Change management tools part 1: using fishbone analysis to investigate problems. *Nursing Times;* 109: 15: 18-20.
To ensure patients get the best care, there is a need to analyse and change nursing practice, demonstrated in the report on the Mid Staffordshire public inquiry.

This article, the first in a three-part series on change management tools, examines how using fishbone analysis to identify the cause of problems, leading to solutions and action plans, can assist staff to make changes to their service to benefit both patients and staff. A case study of a team trying to reduce clinic waiting times is discussed.

In the 1950s, Japanese Professor Kaurou Ishikawa was the first person to describe the cause of a problem using a visual diagram, commonly known as the fishbone analysis diagram, named for its resemblance to a fish backbone and ribs. It has since become a key diagnostic tool for analysing and illustrating problems within root cause analysis (Galley, 2012) and is a useful diagnostic tool in service improvement projects.

Fishbone analysis begins with a problem and the fishbone provides a template to separate and categorise the causes. Usually there are six categories, but the number can be changed depending on the problem (Fig 1). This method allows problems to be analysed and, if it is used with colleagues, it gives everybody an insight into the problem so solutions can be developed collaboratively (NHS Institute for Innovation and Improvement, 2008).

Organisations in which staff are encouraged to evaluate practice, risk and mistakes when they occur tend to have a culture where root cause analysis or fishbone analysis is used. This helps to truly understand the cause of a problem and to clarify issues (Esmail, 2011).

Root cause analysis
Root cause analysis is increasingly being used in health and social service to improve safety and quality and minimise adverse events (Pearson, 2005) as it provides retrospective reviews of incidents or events.

5 key points

1 Visual diagrams can be helpful in analysing and illustrating clinical problems

2 Root cause analysis is being increasingly used in healthcare settings by a variety of staff

3 Using a group facilitator helps prevent problem-solving groups from going off on tangents and being unable to develop an action plan

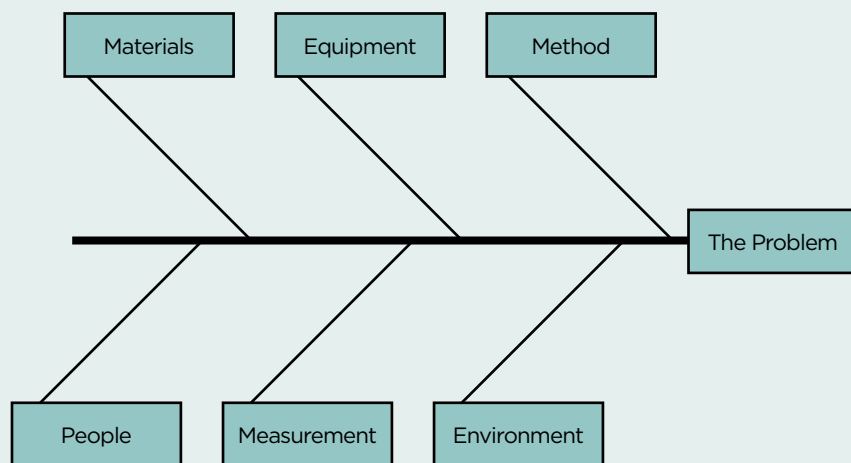**4** Exploring issues in detail can reveal possible solutions that might not have been previously considered

5 Using an open question approach to analysis is helpful in determining the relationship between root causes

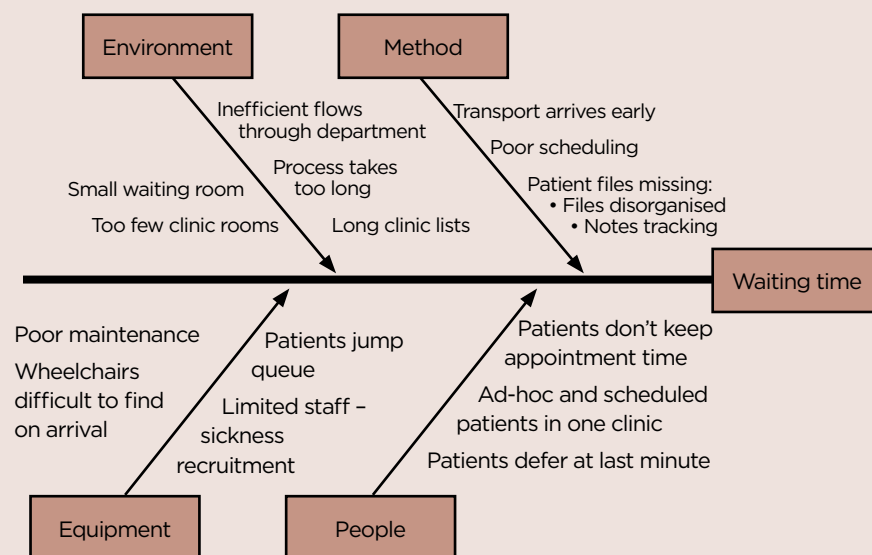## FIG 1. **TYPICAL FISHBONE ANALYSIS DIAGRAM**

Fishbone analysis in practice – a case study

A group of staff from an outpatient clinic wanted to understand what caused the common problem of long waiting times for outpatient appointments. They held a meeting with all the key staff involved in the outpatient clinic, so as to include all parties in the exercise. The group asked a member of their trust's service improvement team to facilitate the session and support them in writing up.

The team involved in the outpatient clinic met together and started by agreeing the problem statement, which the facilitator then wrote on a flipchart (Fig 2). The fishbone analysis tool was used to clearly document all the causes of waiting times they identified. Once the problem statement was agreed, they started to tease out all possible causes of the problem using the "five whys" – an open question approach to analysis using questions starting with why, what, when, who and where – which was helpful in determining the relationship between root causes (Senge et al, 1994). This allowed the group's thought process to develop and investigate possible causes, rather than using closed questions, which tend to produce just one-word answers. Having a facilitator was key to progressing discussions as it let the group focusing on the problem at hand, while someone else facilitated the session.

Once the group had agreed what all the possible causes of lengthy waiting times were, they revisited each cause to understand why and how it affected the problem. For example, the clinic's location and the

A cause and effect chart (Hughes et al, 2009), such as fishbone analysis, provides a tool to identify all the possible causes of a problem not just the obvious ones. It seeks to locate the "root" of the problem from a systemic perspective rather than through personal blame.

Root cause analysis aims to answer the following questions:
» What happened?
» How did it happen?
» Why did it happen?
» What solutions can be developed and fed back to staff (NHS Scotland, 2007)?

When using a fishbone diagram method of root cause analysis, the following steps should be taken:
» The group should be made up of all staff available from the service or clinical pathway;
» They should start with a mind-mapping exercise to evoke ideas and issues (causes) that are related to or affect the problem (effect);
» Each main category should then be explored in detail to identify the causes of issues;
» A facilitator should act as a note taker and keep the group on track, preventing members from being side-tracked by tangents, which detracts from the event at hand and could prevent them from developing a strong action plan (Moravec and Emmons, 2011).

This process elicits root causes rather than just symptoms and results in a detailed visual diagram of all the possible causes of a particular problem. Exploring issues in detail often demonstrates possible solutions that might not have been previously considered.

There are a number of factors to consider when organising and facilitating a session that uses the fishbone diagram to identify issues relating to a clinical pathway or process review (Box 1) (NHS III, 2008).

Although participating in a root cause analysis exercise may seem daunting, the critical thinking skills gained through the experience can help staff in their roles in health (Tschannen and Aebersold, 2010). Lambton and Mahlmeister (2010) involved student nurses in root cause analysis exercises to develop their awareness of the responsibility and professional duty to participate in making a patient environment safer.

FIG 2. **SAMPLE FISHBONE ANALYSIS**

BOX 1. **USING THE FISHBONE DIAGRAM**

When using the diagram to identify issues the following factors should be considered:
● Enable all stakeholders (participants) to be present at the brain storming exercise – this is important to ensure the meeting can cover all aspects of the problem
● Make sure the group are clear and all agree on the problem to be discussed
● Use paper so the final diagram can be written up
● Draw a broad arrow from left to right towards the "effect" (problem)
● Agree on the headings for each arrow (category)
● The group should list all possible causes or factors for each category in turn
● Ideally causes should not appear more than one category although some causes may overlap

number of clinic rooms had not previously been considered in conjunction with the clinic list, which meant there was no correlation between the number of patients on the clinic list (demand) and the available clinic rooms (capacity). The group also identified that checking patient notes was done during the afternoon before the clinic started, which did not leave enough time to chase any missing notes.

By using root cause analysis methodology, they were able to highlight a number of solutions to their problem (Kerridge,

2012). These included scoping the requirement for a patient notes tracking system and considering moving the outpatient clinic to a clinic with more space. The facilitator assisted the group in drafting an action plan for next steps that offered structure to resolving the problem and a small project was initiated to deliver improvements. The action plan included:
» Looking in to the feasibility of increasing the number of clinic rooms based on activity;
» Drawing up a spaghetti diagram, a diagram representing the path followed, to clearly understand department flow inefficiencies;
» Discussing arrival times with patient transport;
» Processing a map of how patient files are pulled and prepared for clinic.

Conclusion

Fishbone analysis provides a template to separate and categorise possible causes of a problem by allowing teams to focus on the content of the problem, rather than the history. It is useful in root cause analysis, which is increasingly being used in health services to improve safety and care quality.

A successful way of using fishbone analysis is to encourage a group of staff who are involved with a service or clinical pathway to work together to identify all possible causes of a problem. These causes are then categorised in groups, such as environment, method, people and equipment. On completing this exercise, the solutions will likely be identified and an action plan for next steps can be drawn up. **NT**

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CHANGE MANAGEMENT TOOLS

1. Using fishbone analysis to investigate clinical problems – 16 April
2. Managing clinical improvement projects – 23 April
3. Use of process mapping in service improvement – 30 April