# How to Use the Fishbone Tool for Root Cause Analysis

**Overview:** Root cause analysis is a structured team process that assists in identifying underlying factors or causes of an adverse event or near-miss.  Understanding the contributing factors or causes of a system failure can help develop actions that sustain the correction.

A cause and effect diagram, often called a "fishbone" diagram, can help in brainstorming to identify possible causes of a problem and in sorting ideas into useful categories. A fishbone diagram is a visual way to look at cause and effect. It is a more structured approach than some other tools available for brainstorming causes of a problem (e.g., the Five Whys tool). The problem or effect is displayed at the head or mouth of the fish. Possible contributing causes are listed on the smaller "bones" under various cause categories. A fishbone diagram can be helpful in identifying possible causes for a problem that might not otherwise be considered by directing the team to look at the categories and think of alternative causes. Include team members who have personal knowledge of the processes and systems involved in the problem or event to be investigated.

## Directions:
The team using the fishbone diagram tool should carry out the steps listed below.

- Agree on the problem statement (also referred to as the effect). This is written at the mouth of the "fish." Be as clear and specific as you can about the problem. Beware of defining the problem in terms of a solution (e.g., we need more of something).
- Agree on the major categories of causes of the problem (written as branches from the main arrow). Major categories often include: equipment or supply factors, environmental factors, rules/policy/procedure factors, and people/staff factors.
- Brainstorm all the possible causes of the problem. Ask "Why does this happen?" As each idea is given, the facilitator writes the causal factor as a branch from the appropriate category (places it on the fishbone diagram). Causes can be written in several places if they relate to several categories.
- Again asks "Why does this happen?" about each cause. Write sub-causes branching off the cause branches.
- Continues to ask "Why?" and generate deeper levels of causes and continue organizing them under related causes or categories. This will help you to identify and then address root causes to prevent future problems.

**Tips:**

- Use the fishbone diagram tool to keep the team focused on the causes of the problem, rather than the symptoms.
- Consider drawing your fish on a flip chart or large dry erase board.
- Make sure to leave enough space between the major categories on the diagram so that you can add minor detailed causes later.
- When you are brainstorming causes, consider having team members write each cause on sticky notes, going around the group asking each person for one cause. Continue going through the rounds, getting more causes, until all ideas are exhausted.

- Encourage each person to participate in the brainstorming activity and to voice their own opinions.
- Note that the "five-whys" technique is often used in conjunction with the fishbone diagram – keep asking why until you get to the root cause.
- To help identify the root causes from all the ideas generated, consider a multi-voting technique such as having each team member identify the top three root causes. Ask each team member to place three tally marks or colored sticky dots on the fishbone next to what they believe are the root causes that could potentially be addressed.

**Examples:**

Here is an example of the start of a fishbone diagram that shows sample categories to consider, along with some sample causes.
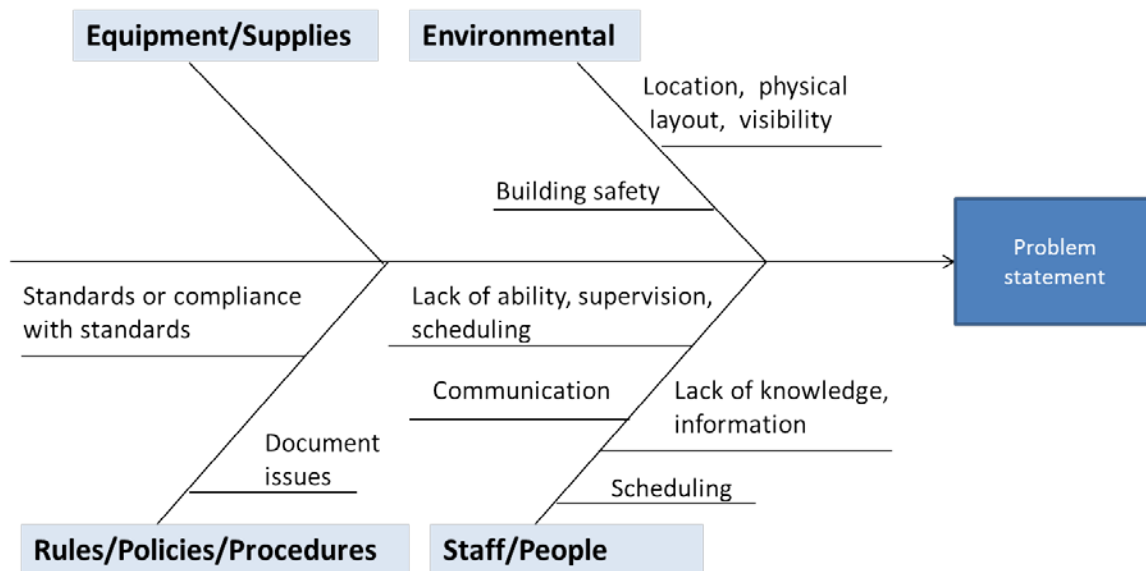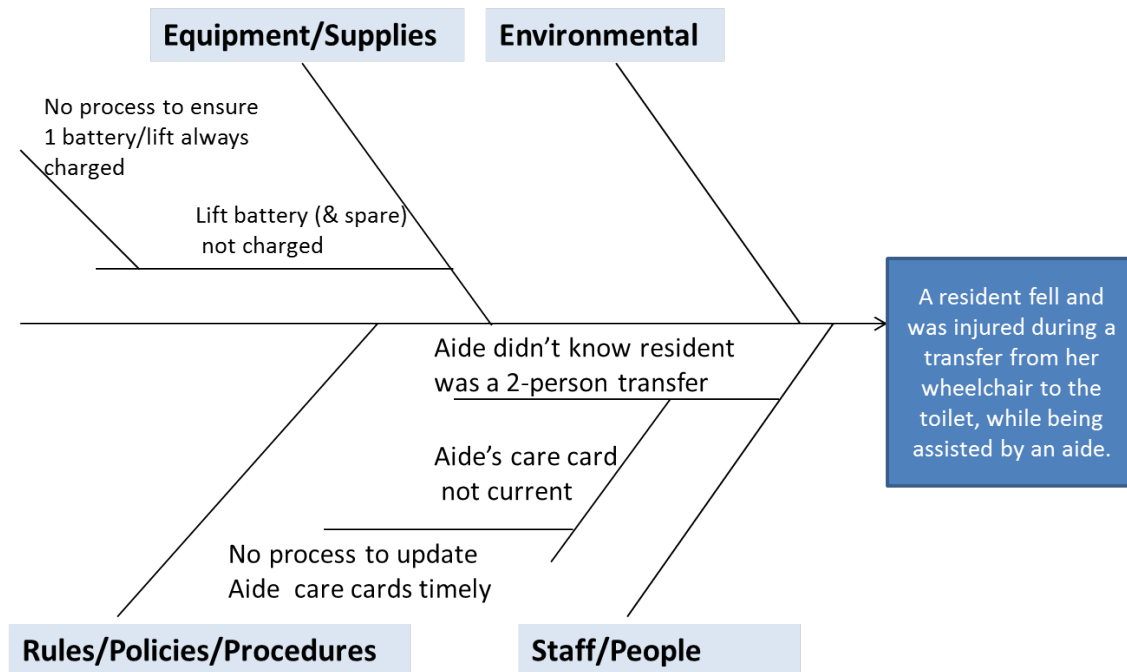


Here is an example of a completed fishbone diagram, showing information entered for each of the four categories agreed upon by this team. Note, as each category is explored, teams may not always identify problems in each of the categories.

Facts gathered during preliminary investigation:
- Time of fall: change of shift from days to evenings
- Location of fall: resident's bathroom
- Witnesses: resident and aide
- Background:  the plan of care stipulated that the resident was to be transferred with two staff members, or with one staff member using a sit-to-stand lift.
- Information from interviews: the resident was anxious and needing to use the bathroom urgently. The aide was helping the resident transfer from her wheelchair to the toilet, without using a lift, and the resident fell, sustaining an injury. The aide stated she did not use the lift because the battery was being recharged, and there was no extra battery available. The aide stated she understood that the resident could be transferred with assist of one.
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With this information, the team proceeded to use the fishbone diagram to better understand the causes of the event.

**Equipment/Supplies**   **Environmental**

No process to ensure 1 battery/lift always charged

Lift battery (& spare) not charged

Aide didn't know resident was a 2-person transfer

Aide's care card not current

No process to update Aide care cards timely

**Rules/Policies/Procedures**   **Staff/People**

A resident fell and was injured during a transfer from her wheelchair to the toilet, while being assisted by an aide.

The value of using the fishbone diagram is to dig deeper, to go beyond the initial incident report, to better understand what in the organization's systems and processes are causing the problem, so they can be addressed.

In this example, the root causes of the fall are:
- There is no process in place to ensure that every lift in the building always has a working battery. (One battery for the lift on this unit is no longer working, and the other battery was being recharged.)
- There is no process in place to ensure timely communication of new care information to the aides. (New transfer information had not yet been conveyed to the aide. The aide's "care card" still indicated transfer with assist of one for this resident.)

The root causes of the event are the underlying process and system problems that allowed the contributing factors to culminate in a harmful event. As this example illustrates, there can be more than one root cause. Once you have identified root causes and contributing factors, you will then need to address each root cause and contributing factor as appropriate. For additional guidance on following up on your fishbone diagram findings, see the Guidance for Performing RCA with Performance Improvement Projects tool.