

BALDRIGECOACH®

# Root Cause Analysis and Corrective Action

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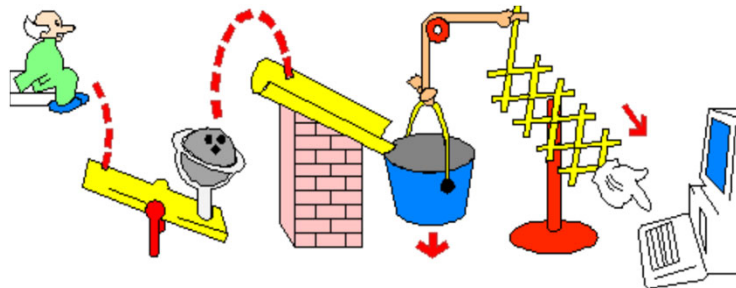
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... or How to:

**Identify the *real* Root Cause(s),  
Implement Effective Corrective  
Actions**



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## What is Root Cause Analysis and Corrective Action (RCA/CA)?

- Systems approach
- Reveals why problems occur
- Shifts culture from blame - to prevention
- Encourages learning from mistakes
- Promotes organizational management instead of crisis management
- Offers a tool for continuous improvement

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## Why RCA/CA?

- Our Customers Expect It, and Our Staff Deserve It
- It Makes Good Business Sense
- It's Part of a Good Quality System
- It Reduces the Frustration from "Solving" the Same Problems Over and Over Again

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Good RCA/CA can help us fix what's wrong...and leave alone what's right



"A prescription without a diagnosis is malpractice."

- *Socrates*

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## Problems and Defects

- A Problem = a Defect when the Result is Not Expected and Not Desirable
- Defects are the Result of an Error Condition

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## What Are Possible Error Conditions?

- Defects
  - Burnt toast
  - Blank copies
  - Dead car battery

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“Man - a creature made at  
the end of the week, when  
God was tired.”

Mark Twain

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## Ten Types of Human ERRORS



1. **Forgetfulness** (i.e., “I haven’t done this for a while”)
2. **Errors due to misunderstanding**
3. **Errors in identification** (i.e., when items look similar)
4. **Errors made from lack of experience**
5. **Willful errors** (ex., “the old way is better”)
6. **Inadvertent errors** ( i.e., “I was lost in thought”)
7. **Errors due to slowness** (or lack of necessary reflexes)
8. **Errors due to lack of standards**
9. **Surprise errors** ( i.e., when a machine runs differently than expected)
10. **Intentional errors** -- the **LEAST** common

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## Understanding “Our” Defects...

### Possible error conditions?

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## 5 Whys? Maybe...

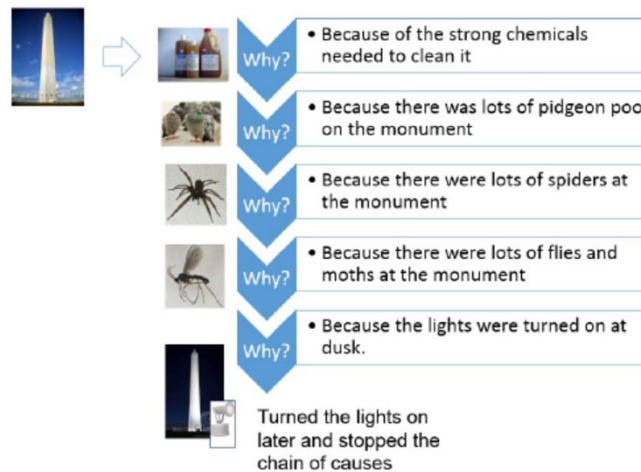
- The Japanese say “Ask why 5 times.”
- Why not more?
- Keep going until your answer to why is:
  - I don’t know, and I have no way of getting the answer.
  - I don’t care. (It fell because of gravity. Why is there gravity? I don’t care.)

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## Typical Root Cause Analysis – the Five Why’s

### The 5 Why’s of the Washington Monument Why was the Washington monument deteriorating?



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# Why Aren't the Five Why's Always Effective?

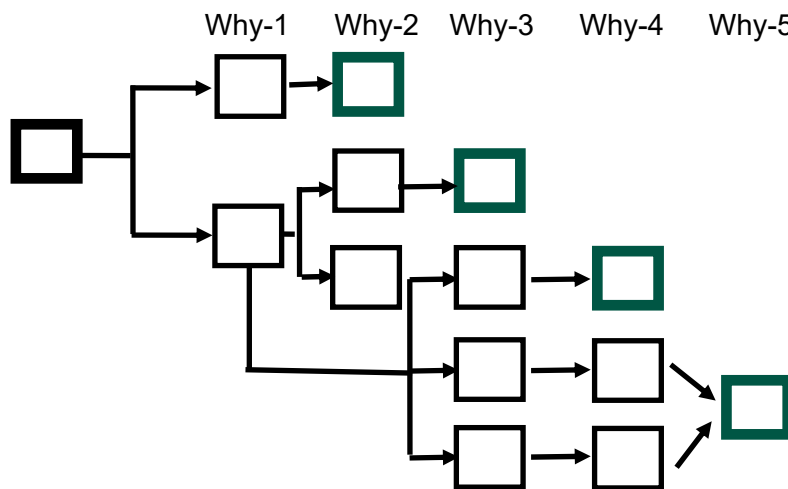
Ever hear about the *Perfect Storm*?



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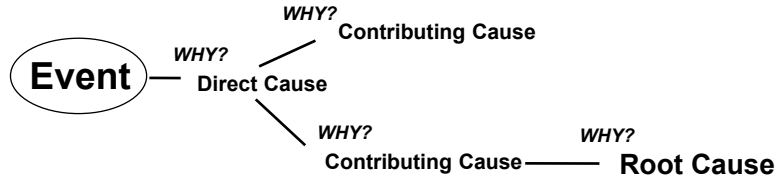
# Horizontal Root Cause Analysis



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# Cause Chain Diagram

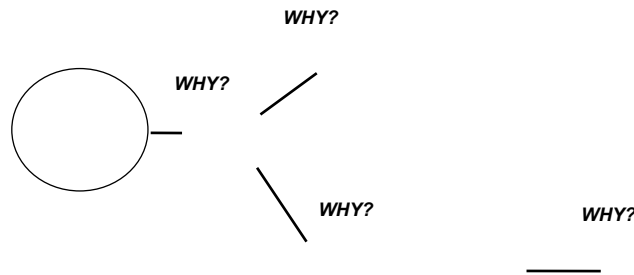


**Direct Cause** - The cause that directly resulted in the event or DEFECT. The first cause in the chain.

**Contributing Cause** - The cause(s) that contributed to an event itself but, by itself, would not have caused the event. The causes after the direct cause.

**Root Cause** - The fundamental reason for the event, which if corrected, would prevent recurrence. The last cause in the chain.

# Creating a Cause Chain Diagram...



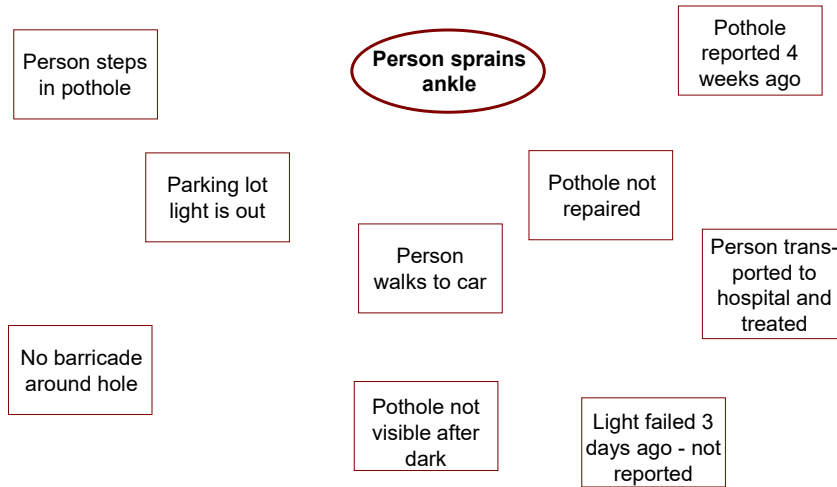
Direct Cause \_\_\_\_\_

Contributing Cause \_\_\_\_\_

Root Cause \_\_\_\_\_



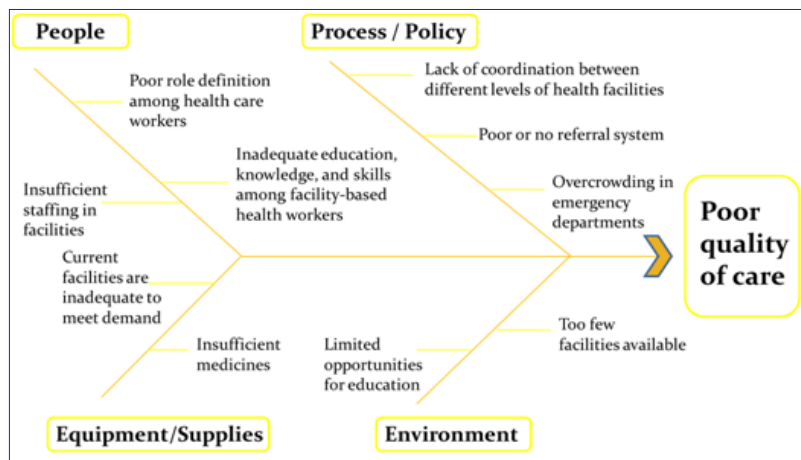
# Example



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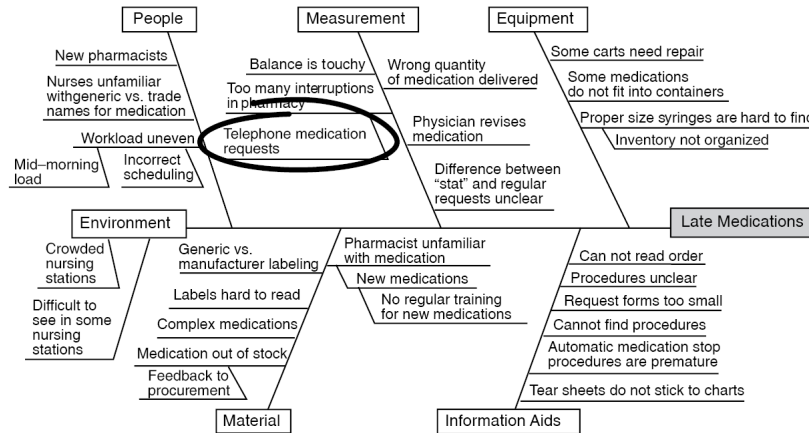
# A Fishbone Diagram



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## Another Fishbone Diagram



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## Defect Concentration Diagram

- Simple visual tool that helps in collecting and analyzing data
- Uses a sketch, a picture, a layout of the area being investigated
- Observations of defects (and sometimes, their type) are recorded

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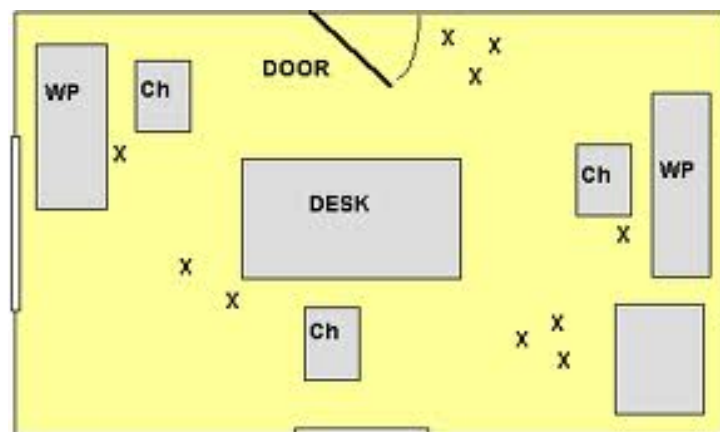
## Evaluating a Concentration Diagram

- Is there a pattern here and what could it be telling us?
- Why are the defects concentrated in a particular area or areas?
- Why are there NOT defects in some areas? (Sometimes this question is as important as why there are problems in other areas.)
- What could be causing the pattern?

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## Locations of Office Accidents

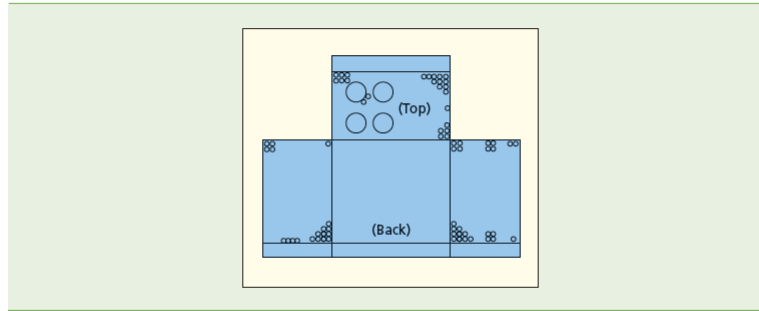


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## Locations of Property Damage

**FIGURE 17.32** Defect Concentration Diagram Showing the Locations of Enamel Chips on Kitchen Ranges



Source: "The Tools of Quality Part V: Check Sheets," from *QI Tools: Data Collection Workbook*, p. 11. Copyright © 1989. Juran Institute, Inc. Reprinted with permission from Juran Institute, Inc.

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## Change Analysis

- Did we formerly provide services without defects? If yes, what changed???
  - Personnel
  - Equipment
  - Environment
  - Procedures
  - Process
  - Suppliers
  - Communication

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## Which Root Cause(s)???

- Use data to determine the occurrences of the defect resulting from the potential root causes (error conditions)
- Ask for input from the involved work groups to tap into their experience
- Prioritize efforts
  - Customer impact
  - Business impact (cost, cycle time, etc.)
  - Frequency of occurrence
  - Severity of the defect(s) created



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## And Don't Forget ... "Clean Up"

- Consider...
  - Where should we have detected the defect?
  - Where should we have detected the error condition?
- What actions should we take to improve our detection capabilities?
- How do we communicate our knowledge about the problem and the corrective action?



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## Practice: A Real-life Scenario

- Review the “Fact Sheet”
- Define the problem
- Using any of the tools we have reviewed, identify the root cause(s)
- (Using only the data you have), identify potential corrective action(s)

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## The Patient

A patient was placed on a gurney by the nursing staff to await transport from the unit to Ultrasound. She was using a portable O<sub>2</sub> tank. The RN on duty assessed the patient's O<sub>2</sub> prior to transport. The orderly delivered the patient to Ultrasound and notified the ultrasound tech that the patient had arrived and was on O<sub>2</sub>. Another orderly later transported the patient back to her unit, leaving her on a gurney outside the nursing station. The orderly told the nurse that the patient had returned. Later, a CNA found the patient still on the gurney with the O<sub>2</sub> tank empty. The patient was not breathing and had low blood pressure. The CNA then moved the patient to her room and connected her to 100% O<sub>2</sub> via a facemask. The patient ultimately recovered.

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## Additional Facts -- The Patient

- The O<sub>2</sub> tank had a flowmeter and regulator.
- Ultrasound is a room without an independent O<sub>2</sub> source. Therefore, a patient's only source of O<sub>2</sub> is a transport tank.
- The patient was an elderly woman from Japan.
- The nursing station was short-staffed during the shift when the incident occurred.

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## The Titanic

It was just before midnight on April 14, 1912 and the R.M.S. Titanic was at the end of the fourth day into her maiden voyage. Just off the coast of Newfoundland, while most passengers slept, the ship struck a huge iceberg. Despite the collision, few believed the "unsinkable" ship was in real trouble. Captain Edwin J. Smith called for the ship's designer, a passenger onboard, who surveyed the damage and concluded that the ship would founder within ninety minutes. Captain Smith immediately ordered the women and children into the lifeboats. The radio operator sent emergency signals to nearby ships, but the closest ship had turned off its radio for the night. Confusion and panic ensued when it was discovered that there were not enough lifeboats. Less than three hours from the time of the collision the ship sank beneath the waves and more than 1500 people were lost.

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## Additional Facts -- Titanic

- High speed (~22 knots) given the conditions
- Moonless night
- Only two look-out officers, neither at the bow
- No binoculars were used
- No searchlights were used
- 15-20 minutes elapsed before the seriousness of the collision was realized by those in charge
- *The Californian*, the closest ship, failed to respond to the first emergency rocket
- Total rated lifeboat capacity: 1178 Total number of passengers and crew: 2201
- No lifeboat drills had been conducted

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## The Electrician

A computer programmer on overtime and behind schedule asked an electrician to repair a blown fuse on the main power board used to run the mainframe computer. The programmer requested that the board not be powered off during the repair. The electrician obliged. While working on the problem, a part of his body made contact with the earth and his hands with an active wire of the particular circuit being repaired. The electrician was electrocuted and died while working on the live power board.

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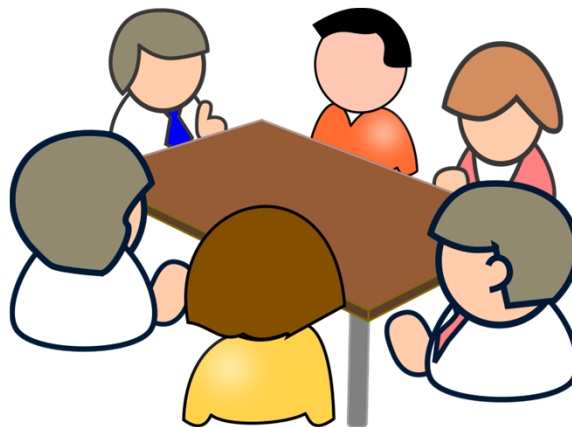
## Additional Facts -- The Electrician

- The area behind the power board had limited access and space was tightly constrained.
- The electrician was a contract employee.
- The company had an Emergency Response Team available on day shift.
- No one with knowledge of CPR was readily available to administer aid.

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## Report Out



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Questions? Next steps...

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