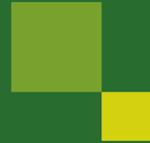


# Root Cause *Analysis*



The content in this leaflet is from the book, *Using Root Cause Analysis to Improve Patient Safety*, published by Healthcare Quality Quest Ltd.

Healthcare Quality Quest Ltd  
Shelley Farm  
Shelley Lane  
Ower  
Romsey  
Hampshire  
SO51 6AS  
Tel: 00 44 (0)23 8081 4024  
Fax: 00 44 (0)23 8081 4020  
Email: [hqq@hqq.co.uk](mailto:hqq@hqq.co.uk)  
Web: [www.hqq.co.uk](http://www.hqq.co.uk)

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# Root Cause Analysis

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# What is root cause analysis (RCA)

RCA is a generic method used in quality improvement and patient safety projects. In patient safety, it should help teams to 'get to the bottom' of the circumstances that led or could lead to an incident and take appropriate and effective action to prevent the recurrence of the incident or minimize the probability of recurrence. Definitions of RCA are in the box.<sup>1-4</sup>

A structured **retrospective analysis** of an event or situation that aims to identify its **true causes** and the **actions** needed to eliminate them, using a wide range of approaches, tools and techniques to uncover causes

A **structured** methodology for **identifying** causal or contributing **factors** underlying an adverse event or other critical incident and acting on the factors

RCA is designed to answer these basic questions about an event or a situation that has caused or could cause harm:<sup>5-6</sup>

- **What** happened?
- **Why** did it happen?
- **What can be done to prevent it** from happening again?
- **Has the risk of recurrence of the event actually been reduced?**

## Benefits of root cause analysis

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RCA helps teams and the healthcare organization understand in detail why something, such as an incident, happened and identify and implement actions needed to prevent the same thing from happening again or to reduce the probability that the same event or situation will happen again. The benefits of RCA are in the box.

Analysing an event or incident or a situation can help clinicians and a healthcare organization to:

- completely and **objectively describe the event**
- **identify and preserve** for further analysis **information, materials or equipment** involved in the event
- **analyse the processes or systems** used in the organization that relate to the event
- figure out **if the processes or systems** involved **can be improved** and if so, how
- find **root causes** of the event
- identify **factors** that could have **contributed** directly or indirectly to the occurrence of the event
- decide on **ways to prevent** the **recurrence** of the same or a highly similar event in the future and implement those ways.

## Who does an RCA

The organization needs to appoint a person who in turn can form a team to do an RCA for a specific situation. The suggested membership of the team and the contributions and functions of each team member are in the box.

Team role	Contributions and functions
<b>Leader</b>	<b>Leads</b> the team in carrying out the RCA
<b>Facilitator (if needed)</b>	<b>Expert in</b> the tools used in RCA  Works with the leader to plan the work and <b>helps the team</b> in carrying out the work
<b>Team members</b>	<b>Individuals who:</b> <ul style="list-style-type: none"><li>■ <b>have first-hand knowledge</b> of the ‘nuts and bolts’ of the processes or systems related to the situation or</li><li>■ <b>the ability to question and critically analyse</b> existing processes or systems</li></ul> Can include an <b>expert in</b> the <b>content of the</b> clinical or related <b>work</b> involved in the situation

## RCA method — S-O-L-V-E-D

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In RCA, a team analyses a situation by systematically carrying out the stages in the box. The stages are represented by the acronym **S-O-L-V-E-D**.

1. **S** **Seek all the facts** related to the situation such as an incident and prepare a timeline including:
  - exactly **what** happened
  - **where** did it happen
  - **when** did it happen
  - who was involved by **role not by name**
  - **how** did it happen, that is, the exact sequence of what happened.
2. **O** **Obtain, preserve and interpret as needed materials** associated with the situation including:
  - information
  - equipment or devices
  - medications, supplies or materials.
3. **L** **Learn the processes or systems** that are relevant to the incident. Map the step-by-step way of handling the task or work related to what happened in the situation, including:

- how each process or system is **authorized** to be carried out in a formal approved document
  - how each process or system is **usually** carried out by staff
  - how each process or system was carried out **in the actual situation.**
4. **V**alidate the analysis and identify the problems and the true root causes of the breakdown in processes or systems.

Make a list of the specific problems in care or service identified so far, and carry out analysis to find their causes. Causes and contributory factors can include: inconsistent or breakdowns in patient care or organizational processes or systems; staffing-related issues; equipment or supplies shortcomings; lack of, incomplete or untimely information or communications; lack of knowledge or skills; cultural influences; or patient or human factors.

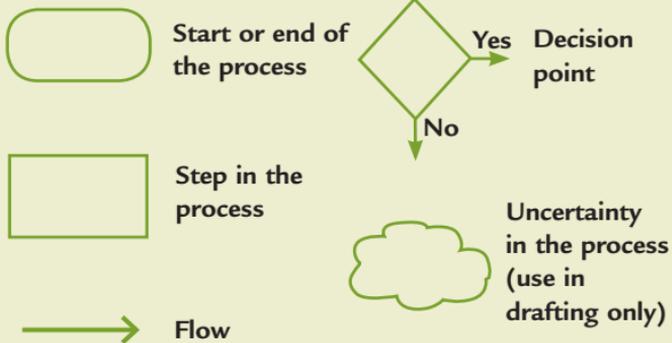
5. **E**stablish and implement action needed to reduce the probability of recurrence of the situation. Focus on actual causes and contributing factors. Implement actions that are:
- **effective** in reducing or eliminating the cause/s
  - **feasible** to do in the organization.
6. **D**etermine the effectiveness of the actions taken. Plan and carry out measurement of the effect of the actions implemented.

## Tools used in RCA

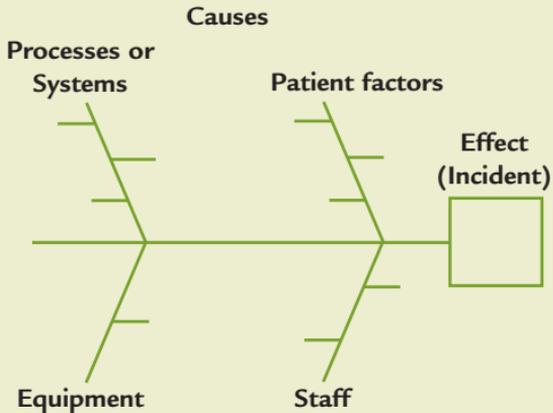
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<b>Process map (flow chart)</b>	A <b>diagram</b> of a process that <b>shows</b> in sequence <b>every</b> major activity or <b>step in the process</b> and the relationships among the activities or steps
<b>Asking why five times</b>	A tool for getting past the symptoms of a situation or a problem to identify its root cause by <b>systematically analysing a cause-and-effect chain backwards</b>
<b>Fishbone diagram</b>	A tool to structure thinking about possible <b>causes of a problem</b> , useful for identifying and analysing multiple potential causes of a situation or a problem.
<b>Tree diagram</b>	A way of <b>breaking down logically</b> a situation, an incident, or a problem into its <b>actual causes</b> and <b>contributory factors</b> and showing their interactions
<b>Run chart</b>	A tool for finding variation in practice and the <b>type of variation</b>

## Symbols for process mapping



## Example: Fishbone diagram



## Failure mode and effects analysis

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Many healthcare organizations have learned from RCAs of patient safety events that cascades of breakdowns in systems, including implicit systems followed by clinicians, are at the root of incidents. A tool called Failure Mode and Effects Analysis (FMEA) helps organizations to anticipate where incidents could happen and take proactive action to prevent such events. The term FMEA is defined in the box.<sup>7</sup>

A systematic, proactive method of evaluating a process to identify **where and how it might fail and** to assess the relative **impact of different failures**, in order to identify the parts of the process that are most in need of change

FMEA includes analysis of the following:<sup>8</sup>

- the **steps** in a key process that represent a risk of harm to patients
- failure modes (**What could go wrong?**)
- failure effects (**What would be the consequences of each failure?**)
- failure causes (**Why would the failure happen?**)

## Aggregate RCA

When the same or a highly similar incident happens repeatedly, an RCA may be carried out on each individual incident. However, it may be unclear to a clinical service or to an organization that there is a pattern of highly related incidents. It is more sensible for a healthcare organization to analyse all the same or highly similar events in one RCA. The purposes are to:

- identify patterns or trends across highly related incidents that are unlikely to be revealed in the analysis of a single incident
- make more effective and efficient use of the time of the staff carrying out root cause analysis
- enable more appropriate and effective actions to be identified and implemented to prevent or substantially reduce the recurrence of the incident.

The term aggregate RCA is defined in the box.

A structured analysis that involves **collecting and analysing** information from **multiple similar incidents** in a single root cause analysis, and then searching for the **key themes** of causes that occurred in all or most of the incidents

# References

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1. Andersen B, Fagerhaug T. *Root Cause Analysis. Simplified Tools and Techniques*. Milwaukee WI: ASQ Quality Press; 2000.
2. Bagian JP, Gosbee J, Lee CZ, Williams L, McKnight SD, Mannos DM. The Veterans Affairs root cause analysis system in action. *Jt Comm J Qual Improv* 2002;28:531–45.
3. *Conducting a Root Cause Analysis in Response to a Sentinel Event*. Oakbrook Terrace IL: Joint Commission on Accreditation of Healthcare Organizations; 1996.
4. US Department of Veterans Affairs. National Center for Patient Safety. Root Cause Analysis (RCA). Available at: <https://www.patientsafety.va.gov/professionals/onthejob/rca.asp>. Last accessed 5 April 2019.
5. Bagian JP, Gosbee J, Lee CZ, Williams L, McKnight SD, Mannos DM. The Veterans Affairs root cause analysis system in action. *Jt Comm J Qual Improv* 2002;28:531–45.
6. Wu AW, Lipshutz AKM, Pronovost PJ. Effectiveness and efficiency of root cause analysis in medicine. *JAMA* 2008;299(6):685–7.
7. DeRosier J, Stalhandske E, Bagian JP, Nudell JP, Nudell T. Using Health Care Failure Mode and Effect Analysis™: The VA National Center for Patient Safety's Prospective Risk Analysis System. *Jt Comm J Qual Improv* 2002;28(5):248–67.
8. Institute for Healthcare Improvement. Failure Modes and Effects Analysis (FMEA) Tool. Available at: [www.ihl.org/resources/Pages/Tools/FailureModesandEffectsAnalysisTool.aspx](http://www.ihl.org/resources/Pages/Tools/FailureModesandEffectsAnalysisTool.aspx). Last accessed 5 April 2019.

## Our RCA publications

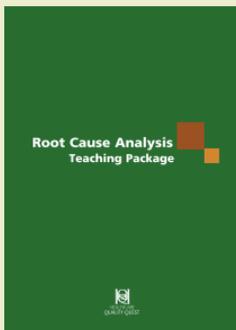
For more information about the RCA process and how to carry out an RCA, see our RCA book.



The ***Using Root Cause Analysis to Improve Patient Safety*** book is a comprehensive reference book on the RCA process and how to carry out an RCA in detail.

The book walks through the stages in an RCA and gives an explanation of tools to use in each stage, with examples. The book is easy to follow with diagrams, clear definitions and a complete example of a patient-related root cause analysis. The book is based on current evidence related to carrying out root cause analysis in a healthcare setting.

Extensive references are provided. In addition, the book includes a short summary and example of failure mode and effects analysis and a summary and examples of aggregate root cause analysis. It also includes practical advice on organizing the work involved in a root cause analysis, working with a small team.



Our ***Root Cause Analysis Teaching Package*** is a comprehensive ‘train the trainer’ package which provides extensive guidance on how to teach root cause analysis in a healthcare organization.

The package is accompanied by a How to Teach Root Cause Analysis Workshop for the trainers, supported by a 90-page book on

***How to Teach Root Cause Analysis***, a guide to teaching (rather than doing) root cause analysis. It explains how to be an effective teacher, including: how to identify learner needs about RCA; the importance of terminology and how to explain terms; how adults learn; important stages in RCA and how to help staff master them; types of evaluation of learning; and approaches to evaluating and reviewing learning.

The package includes:

- detailed advice for trainers on how to use the train the trainer package
- PowerPoint slide presentations for a one- or two-day workshop on root cause analysis
- comprehensive teaching notes on how to explain the content on the PowerPoint slides
- a workbook on root cause analysis to be copied for each participant in a workshop
- additional materials to support providing workshops on root cause analysis.

## Our RCA workshop

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To develop competence and confidence in carrying out an RCA, and facilitate teams to carry out an RCA, see information about our RCA workshop at [www.hqq.co.uk](http://www.hqq.co.uk).

**Root Cause Analysis workshop** – A one-day learning experience about root cause analysis. The aims of the workshop are to help staff to:

- know why to use a systematic approach to analyse an incident and act to improve the safety of patient care
- be able to carry out an RCA properly.

The objectives of the workshop are to help staff to:

- know the key findings from the evidence base on RCA, including what's involved in human factors, and the purpose of an RCA
- describe an incident properly for RCA purposes, including asking the staff involved for facts about the incident and developing a timeline
- identify and analyse the system or processes involved in the incident and how failure happened
- find the problems in care and service delivery and the causes and contributory factors of the incident
- identify effective and feasible action needed to **prevent recurrence** of the incident
- know how to measure the effectiveness of action implemented to prevent the same incident from happening again.

## What people say

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Following are examples of what people say about our RCA workshops.

- “An excellent day, very valuable. THANK YOU VERY MUCH!”
- “Definitely recommend the workshop to all staff!”
- “Excellent structure and delivery and very good training material”
- “Impressive course. A difficult subject delivered very succinctly and flawlessly. Well done!”
- “Excellent presentation which showed value of RCA in identifying current procedures and where change is required”
- “Expert facilitation was critical to the success”
- “This ought to be mandatory for all senior clinicians”
- “It is difficult to engage trainees for a full day, but the facilitator really achieved it. Thank you so much”
- “I now feel confident completing a root cause analysis with appropriate support and supervision”
- “Really great course that I’ve thoroughly enjoyed. I believe I have learnt new skills that would enable me to complete an RCA”

## About Healthcare Quality Quest (HQQ)

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We consult, teach and publish on the subject of being accountable for and improving the quality and safety of healthcare services.

We have developed and published methodologies related to root cause analysis of incidents relating to patient care, clinical audit and quality improvement.

We develop and teach courses and workshops on clinical governance and related methods and activities, including clinical audit, quality improvement, risk management, patient safety and patient experience and we develop e-learning modules on these subjects as requested.

We also work directly with clinicians and clinical groups, facilitating teamwork where possible. We develop or facilitate the development of standards and examples of good practice in relation to quality of patient care.

We have more than 30 years of experience working in all countries in the UK, as well as Botswana, Holland, Italy, the Republic of Ireland, Saudi Arabia and Taiwan.

For more information about HQQ, please contact us at [hqq@hqq.co.uk](mailto:hqq@hqq.co.uk) or 02380 814024.





Shelley Farm, Shelley Lane, Ower, Romsey, Hampshire SO51 6AS  
Telephone: 00 44 (0)23 8081 4024 Fax: 00 44 (0)23 8081 4020  
Email: [hqq@hqq.co.uk](mailto:hqq@hqq.co.uk) Web: [www.hqq.co.uk](http://www.hqq.co.uk)