ROOT

CAUSE

ANALYSIS

A Summary of Root Cause Analysis and its use in State Developmental Disabilities Agencies

Recommended Procedures for the Review of Sentinel Events and for Identifying Systems Factors that Require Improvement

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Preface

Root Cause Analysis represents a structured approach to the investigation and analysis of significant adverse events or system deficiencies and require improvement. This introduction to root cause analysis, and its adaptation to developmental disabilities systems, has been commissioned by the Human Services Research Institute (HSRI) in an effort to assist state DD program administrators enhance their risk management and quality improvement activities. It is designed to provide guidance on the use of root cause analysis to individuals charged with managing programs and larger systems that serve and support persons with developmental disabilities. It includes information and tools that can be incorporated into existing or planned risk management and quality improvement procedures in order to:

1. **PREVENT** the future occurrence of adverse events that do or can cause harm to individuals; and,
2. **CORRECT** practices that have led to regulatory noncompliance, including identified deficiencies noted by regulatory agencies such as CMS.

Readers interested in applying root cause analysis to specific incidents or adverse events in order to minimize future risk should carefully review *Chapter 2*: *Root Cause Analysis and Risk Management*. They should also review *Chapter 5*: *Tools and Techniques* where they will find a number of different group exercises and forms that can be directly copied or adapted for use by the RCA Team.

Readers only interested in applying root cause analysis to a system failure, such as that identified by a regulatory agency (i.e., citation or deficiency), should focus their review on *Chapter 3: Adapting RCA to the Evaluation of DD System Deficiencies*.

As noted, this overview represents an introduction to the use of root cause analysis specifically adapted to address some of the unique issues and concerns present in support and service systems that assist people with mental retardation and other developmental disabilities. There is substantial literature available for review that addresses the use of root cause analysis in engineering, transportation, and health care settings.   Readers interested in implementing the process on a regular basis are strongly encouraged to review the references and additional resources noted at the end of this manual and to consider additional training, with a clear recognition that such information/training will need to be adapted to the regulatory requirements and special considerations inherent in the field of developmental disabilities.

Contents

1 WHAT is Root Cause Analysis?

Root Cause Analysis (RCA) is an analytic process designed to help identify the underlying factors that have contributed to or have directly caused a major adverse event or systems failure. The results of a RCA are typically utilized to guide and direct changes to processes, the environment, and human behavior in order to prevent or reduce the probability that the adverse event will occur in the future.

Root Cause Analysis has been utilized in a wide variety of industries for the past two decades. While the origin of RCA was within the engineering field, it has quickly became a standard management tool in the fields of transportation and transportation safety, pollution control, nuclear power, information technology, and manufacturing. It is a relatively recent addition to the risk management armamentarium in the health care system, with the JCAHO recognizing its potential and establishing a requirement for RCA in its 1999 sentinel event standards.

The movement to incorporate RCA in health care was driven by a recognition that the health delivery system has become extremely complex and suffers from an abnormally high rate of adverse events that result in harm and even death to the consumers of the system. Estimates suggest that almost 4% of all hospitalizations are associated with an

adverse event and that 16% of these lead to death or serious disabling injuries.[1]

Accidental Deaths in U.S.

Source: National Safety Council
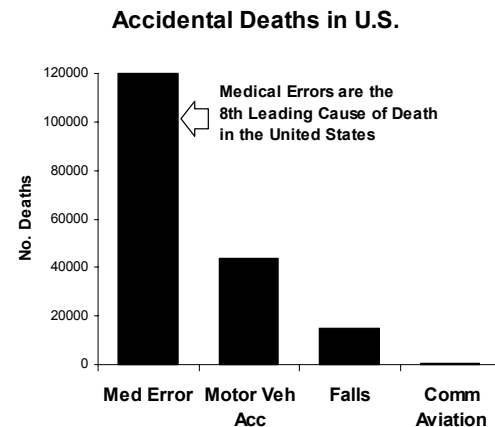
The results of such error in health care are staggering. According to the Harvard School of Public Health, it is estimated that one million people are injured in the hospital, and between 44,000 and 120,000 people die each year as a result of medical errors, more than from motor vehicle accidents, breast cancer, and accidental falls combined.[2]

Given the extent of serious injuries and deaths resulting from preventable medical errors, the Institute of Medicine[3] as well as patient safety organizations have concluded that patient safety can

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[1] Hirsch & Wallace (2001)
[2] Doing What Counts (2000)
[3] Institute of Medicine (1999)

only be improved by increasing the focus on reducing faulty systems. This is best accomplished by embracing a systematic approach to *learning from previous errors* and mistakes and making changes to organizational processes – *not blaming* individuals. Root Cause Analysis is the preferred tool for doing such, and as previously mentioned, is now a required risk management procedure by the JCHO.

More recently the benefits of RCA have started to become recognized by the home health care industry, again driven by standards established by the JCAHO.[4] However, the potential of RCA has been slow to enter the developmental disabilities field, even though many of the very same issues and causes of injury and death are equally present in this service system. To date there are no known regulatory or accreditation requirements for conducting RCA in DD service and support settings, and there is very little evidence of its utilization by service providers or government agencies. Given increasing attention to consumer safety and risk it can be reasonably predicted that in the near future the use of root cause analysis will become a common practice in the DD system.

Some Basic Tenets of RCA

Root Cause Analysis is a process of discovery that attempts to find out exactly WHAT happened, WHY it happened, and HOW it can be prevented from happening again. Consequently, the goal of RCA is *prevention*.

Perhaps more importantly, RCA places a focus on *understanding*, not on *blame*.

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[4] hcpro's accreditinfo.com (2002)

It begins from the basic premise that errors and failures are the result of flaws in the system, not simply the action or inaction of people. As noted by Morey[5], "…the systems which humans are a part call forth errors from humans, not the other way around." Thus, unlike the traditional process of investigation, RCA does not focus on finding out *who* made the mistake, but rather *why* the mistake was made. The emphasis is on identifying the environmental and system factors that directed or allowed a person or persons to make the mistake in the first place.

Root Cause Analysis involves an exploration of CAUSE and EFFECT relationships. It requires a thorough review and analysis of human factors, organizational and support systems, and the formal and informal processes that guide the actions of people within the organization. It does this by directing a series of *why* questions, over and over again, to identify the actual and potential contribution different factors have to causing the event under study. Once causative and contributory factors are identified, the process is repeated to uncover potential solutions and improvements to the system that can act as *barriers* and prevent future failures.

Some Concepts and Terms

ROOT CAUSE ANALYSIS

Process to discover
- **WHAT happened**
- **WHY it happened**
- **HOW it can be prevented**

Focuses on UNDERSTANDING not on BLAMING

Analyses CAUSE and EFFECT relationships

[5] Morey (1994)

Emphasizes SOLUTIONS and System IMPROVEMENTS

Root Cause Analysis has been designed primarily as a risk management tool that can foster a greater understanding of why an incident has happened that affects health and safety and what can be done in the future to prevent its reoccurrence. There are a few basic concepts and terms that are important to understanding and utilizing the process.

1. **Adverse Event**. Any undesirable incident that causes harm or calls into question the adequacy of care.

2. **Barrier**. In root cause analysis a barrier represents a process, environmental change, or system that can prevent or reduce the probability of an adverse event.

3. **Brainstorming**. A process used with a group that encourages free thinking and leads to the generation of numerous ideas.

4. **Contributory Factor.** These are additional reasons, beyond the root cause, that an adverse event has occurred. They increase risk by setting the stage for or contributing to the probability of an adverse event.

5. **Incidental Finding.** Problems, inefficiencies or failures in a process or system that did not contribute to the incident under consideration but which require attention by the organization in order to prevent other types of adverse events.

6. **Proximate Cause.** This is the most obvious reason an adverse event occurred. Usually the proximate cause is identified in investigations. Often it reflects a superficial analysis, focusing on human error.

7. **Root Cause**. This is the most basic and fundamental or underlying cause of an adverse event. It is the "root" of the problem and must be addressed if prevention strategies are to be effective. In most instances the root cause is a systems failure, not human error.

8. **Sentinel Event.** This is an adverse event that is unexpected and that leads directly to or places someone at risk of death or serious harm.

Typical RCA Process

Root Cause Analysis is typically utilized to evaluate a specific adverse or sentinel event. Team members include personnel that were directly involved in the incident as well as supervisory and content experts in the organization. A minimum of three to four meetings are typically scheduled, with the team leader and facilitator performing a number of activities both before and in between formal meetings.

In general, the RCA process involves performing a sequence analysis or detailed description of everything that happened before, during and immediately after the adverse event. The process makes liberal use of flowcharting to provide visual illustrations of the sequence and inter-relationships between the activities of the various units within the organization that may have had any involvement with the incident under study. This is followed by brainstorming to identify factors that may have influenced or contributed to the incident and a rigorous process of classifying and prioritizing these factors to identify the true root cause. Additional time is then spent identifying possible solutions, resulting

in the selection of those that appear to be the most effective and cost efficient.

When to Use RCA

There are usually multiple and varied approaches to solving any given problem, each of which has different resource and time requirements. Root Cause Analysis is a very structured process of discovery that requires users to go through a series of step-by-step activities, all designed to find out why something happened and what can be done to prevent it from happening again. Because it is a structured and formal process, RCA is relatively time-consuming.

In many organizations the demand for immediate action can result in a tendency to select the most expedient process and solution. This *need to act*, often results in repeated and sometimes frenzied efforts to manage "symptoms," rather than the underlying problem that is responsible for the continued appearance of adverse events or system failures. Expediency can be a "double-edged sword." Program and system managers should therefore establish formal or informal criteria to help them decide when to "pause" and take a more comprehensive approach to problem solving, including the use of root cause analysis.

Since RCA is a demanding process, that requires a commitment of time and energy, it should not be used haphazardly – *i.e.*, maintain the integrity of the process and reserve its use for special circumstances where there is significant risk if a problem is not corrected.

The inherent need in most organizations for immediate action following a significant event or major failure (e.g., regulatory citation) can result in a tendency to take "shortcuts," and eliminate steps or modify them to the detriment of the process. This should NOT be done. Save root cause analysis for when its really needed. And, when its needed, invest the time and resource to do it right.

USE ROOT CAUSE ANALYSIS WHEN:

- The cause of a MAJOR system failure is not evident.
- There are repeated failures that are ascribed to HUMAN ERROR.
- There is a SENTINEL EVENT that results in death or serious injury.
- There are a SERIES of incidents that could have resulted in death or serious injury.
- There is TIME to gather information, conduct an investigation, assemble a team, and "think" before acting.

DO NOT USE RCA

- To review every incident or system failure.
- When the reason is obvious.
- When there is NOT TIME to proceed with a formal and rigorous process of discovery.

2 Root Cause Analysis and Adverse Events

Root Cause Analysis is a structured set of processes or activities designed to identify the underlying or fundamental causes of a major adverse event or incident so that specific actions can be targeted to the real cause in an effort to prevent a reoccurrence.

RCA takes time. In fact, a typical review will involve 3 separate meetings of a team of selected staff, each of which is 2-3 hrs in length, plus substantial work in-between meetings to prepare information and materials. A decision to conduct a root cause analysis must be made with recognition of this time and resource commitment. As noted earlier, it is not advisable to institute "shortcuts" that can compromise the process.

Steps for Conducting a RCA

The following 6 steps represent a recommended process for use by state MR/DD agencies that want to conduct a Root Cause Analysis following a significant sentinel or adverse event. Typically such events include very unusual incidents that result in the death of or serious injury to a consumer of the service and support system. Once an agency becomes more comfortable with the process, RCA can be expanded to address incidents that could have resulted in death or serious injury.

The specific nature of the incident under review and the availability of personnel, investigation reports, and other variables, will influence exactly how any given root cause analysis is conducted. In general though, the following steps should be followed as closely as possible.

1. **Clarify the Issue**. RCA should be conducted for one incident or adverse event at a time. If multiple incidents of the same type are under review, it is usually best to complete each RCA separately and then converge or integrate the findings to identify common causes or contributory factors. The first step, therefore, is to identify and clarify the specific event(s) or incident(s) that the team will analyze. It is strongly recommended that the organization establish criteria for selecting events that will meet the threshold for RCA as well as designating an individual or unit for coordinating and managing the process. [Note: most DD agencies have Quality Assurance, Risk Management, or Quality Improvement units that could be given the responsibility for oversight of RCA.]

2. **Assemble the Review Team.** In agencies that have an established Risk Management Division it is recommended that a member of that unit always be assigned to the RCA team. Additional members should include a management or supervisory

representative responsible for the program or service in which the event occurred, the investigator or person most familiar with any investigation that has been completed, a content expert with knowledge of best practices, and one or two personnel who were directly involved in the incident. Membership should be formally appointed or assigned by a senior leader in the organization and should reflect individuals with knowledge of the incident and any policy or practice requirements associated with the type of service or activity involved in the incident. Obviously, membership will vary depending upon the type of incident under review.

3. **Assign Roles and Responsibilities.** Most teams will include 5-7 individuals, all of whom should have clearly assigned tasks and responsibilities. At a minimum, the roles of team leader, meeting facilitator, and note-taker need to be assigned. This leadership group will be responsible for work in-between formal meetings, and should be prepared to commit a least 3-5 hours beyond the time directly spent in meetings. Remaining team members should also be given assignments before the first meeting. Staff either directly involved in the incident and/or those who conducted an investigation should complete a *Sequence Analysis* prior to the first formal meeting. A format for documenting such an analysis can be found in Chapter 5. Other team members can assist with the collection and organization of other data and information that will be utilized in the review.

4. **Collect Information.** Team leadership should identify important and relevant documents and information that will be needed by the team. Such documentation will vary based upon the type of incident under review, and will include items such as:

   a. Investigation report

   b. Autopsy report

   c. Police reports

   d. Interviews

   e. Consumer record (including medical record)

   f. Incident reports

   g. Staff notes/log

   h. Photographs or physical materials involved in the incident

   i. Pertinent policies, procedures, protocols, and guidelines

   j. Training records

   k. Staffing schedules

   l. Inspection or quality review records

   m. Program/site description

   n. Sequence analysis and associated flowchart(s) prepared by knowledgeable staff that summarize exactly what happened in chronological order.

5. **Initiate the Root Cause Analysis.** Once this preparatory work has been completed, you can begin the actual Root Cause Analysis by taking the following steps:

   a. **Schedule and organize the first meeting,** providing

adequate notice. Since RCA relies on a great deal of visual representation, select a location that can comfortably accommodate the full team and that has a large marker board or room for hanging wall charts.

b. **Explain the RCA process** at the first full team meeting. Stress the goal of "prevention" and explain how RCA is different from the typical investigation process most members will be more familiar with. Set up a schedule for the remaining meetings, noting that it will take between 2 and 3 meetings to complete the analysis, with most meetings lasting 2-3 hours. Emphasize the need to complete assignments in between meetings in order to make the maximum use of group time.

c. **Review the incident and identify the proximate cause**. Provide background information about the individual and setting in which the incident occurred. Describe in objective terms what happened. Usually the most immediate or proximate cause will be identified in an investigation report. In many instances it will reflect human error (someone did something they shouldn't have, or didn't do something they were supposed to.)

d. **Review the sequence analysis** that should have been prepared ahead of time

and have staff involved in the case describe exactly what happened. Allow for questions and modification of the sequence. Use a flowchart to illustrate the sequence once it has been finalized.

e. **Compare what actually happened to what "should have happened."** Compare the sequence of events (flowchart) to what the agency policy, procedure or prescribed practice expects "should" have occurred. Make notes on the flowchart to identify any deviations from what standard or best practice suggests needs to occur. Make sure the team leader reiterates the goal of RCA and that the focus is not on "blaming" someone, but rather for identifying factors that may have contributed to the error, if any.

f. **Identify potential contributory factors** that did or could have led to each failure or inability to follow policy requirements and/or minimum standards. First circle process steps on the flowchart that appear to have contributed to the incident. Then brainstorm additional factors (see Chapter 5 for guidance on brainstorming). Reference the *Common Factors Checklist*, also in Chapter 5, and go through each major category to select and eliminate factors that could have contributed to the error or event. During this

stage of RCA it is important to repeatedly use the question "why?" In describing potential causes of failure, the National Council on Patient Safety recommends using the "Five Rules of Causation" which are included in the Appendix. These "rules" strongly suggest team members avoid negative descriptors, focus on real "cause and effect" relationships, always look for preceding causes to human error and procedural violation, and assess the basis for a "duty to act"[6] whenever personal noncompliance is identified.

g. **Identify incidental findings** or inefficient processes or activities that may not have directly contributed to the failure, but which should be further evaluated for possible revision. Make a separate list of these for later consideration by the agency. This process of noting non-contributory factors or issues should occur throughout all of the RCA meetings, but must be managed so that the group does not become focused on collateral issues. Therefore, the note-taker should assure members that the issue has been recorded

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[6] Duty to act is a legal concept. Fault, or non-compliance, can only be attributed to an act or failure to act when there is a clear requirement to do something, such as is present in a formal policy, written program, or a basic and common practice standard.

> ## ESSENTIAL STEPS IN ROOT CAUSE ANALYSIS
>
> - Clarify the issue
> - Assemble a team
> - Collect Information
> - Perform sequence analysis
> - Identify the proximate cause
> - Identify and group contributory factors
> - Ask "WHY," over and over again
> - Document incidental findings
> - Propose solutions
> - Review the literature and experience of others
> - Prioritize solutions
> - Reach consensus on content of report
> - Present findings and recommendations to agency leadership

and will be included in the final report.

h. **Organize the identified contributory factors into clusters**. If time permits, the team facilitator can lead the group in developing an *Affinity Diagram* (see Chapter 5) that can help organize all of the variables discovered thus far. An alternative approach involves using the major headings in the *Common Factors Checklist* and listing each

factor in its most appropriate group. [Note: this is a good point to end the first meeting, notifying participants that they will be asked to "drill down" further at the next meeting to uncover additional factors and begin to prioritize them.]

i. **Prioritize the already identified factors and continue brainstorming** to identify even more. This is the point at which the team leader should be relentless in pushing the team to ask *"Why did the incident take place, the human error occur?"* and *"How did each of these factors contribute to the adverse event?"* Once the team has exhausted all possibilities, reorganize the factors into clusters. Then begin to prioritize the identified factors, rank ordering them according to importance (e.g., most important to least important).

j. **Develop a Contributory Factors Diagram,** to illustrate the relationships between the various factors you have identified. Focus on those factors that the team has rated as most important. In developing the diagram, work to establish a hierarchy, with the system failure at the top, followed by the proximate cause, followed by the categories of contributory factors – rank-ordered - each of which may contain multiple variables. Circle those factors that appear to be the most basic and

EXAMPLE OF CF DIAGRAM

Failure

Proximate Cause

Contributory Factors

Communication — CF #1 / CF #2 / CF #3

Staff Issues — CF #4 / CF #5 / CF #6

Technology — CF #7 / CF #8 / CF #9
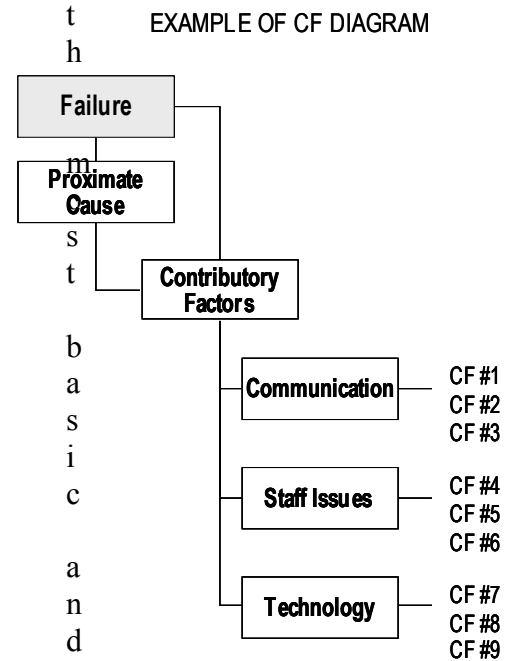
fundamental cause of the incident.

k. **Identify the root cause**, or most fundamental reason that led to the failure. Sometimes the root cause may be related to problems with the prescribed process, *i.e.*, policy requirements are not consistent with accepted practice standards or basic regulatory requirements. In other instances the root cause may be related to insufficient communication to staff or lack of staff skills or knowledge. It may be necessary to combine one or two of the factors to capture the essence of what the most important cause of the error/failure was.

l. **Brainstorm potential solutions** that could address the root cause and priority contributory factors. Discuss any potential *barriers* that

could automatically interfere with or obstruct the most important causes from taking place. [In RCA a barrier is any physical entity or procedure that blocks or reduces the likelihood of an action.] Allow the team to come up with multiple solutions and barriers for each factor. At this point do not attempt to prioritize or evaluate the feasibility of any ideas that are offered. [Note: the completion of this step may represent a good point to end the second meeting. Ask members to think about more solutions before the third meeting.]

m. **Gather information from other sources** prior to the last meeting to provide examples of how similar issues have been dealt with. As noted earlier, review the professional literature, call colleagues in other agencies or states, or seek external consultation. This process should be completed before the last RCA meeting.

n. **Review.** At the next meeting the leader should review the findings to date and share information obtained from other sources. The team can discuss this new information and make revisions, if appropriate, to the listing of solutions and barriers.

o. **Prioritize solutions.** Once all potential solutions are identified, the team should assess the potential

effectiveness, feasibility and estimated cost of adopting each solution and/or barrier. Approaches that are not practical (*e.g.,* have a significant cost or lengthy timeline) should be discarded, resulting in a prioritized list of solutions, and team selection of the "best" approach for each factor. Chapter 5 includes information about the use of an *Efficiency Diagram* to assist the team in setting priorities.

p. **Develop recommendations** based on the top solutions that have been selected. Where possible, estimate potential cost and discuss other special considerations that will be important if the proposed solution is adopted by the leadership of the organization.

q. **Prepare a draft report** that includes your basic findings, rationale, and suggested solutions. Chapter 5 includes a RCA Report Form that can be used or adapted for use as the format for organizing information and preparing a report. Make sure the entire team has an opportunity to review and comment on the contents before issuing the report.

6. **Share the report with the agency leadership.** The leadership of the team should make any needed revisions based on team member comment and prepare the final report. It is strongly recommended

that the team leaders schedule a time to personally present the report to the leadership, making sure to focus on facts, rationale, and the effectiveness and efficiency of proposed solutions. If leadership agrees, an individual or unit within the organization should be designated as responsible for overseeing implementation of strategies and documenting follow-up. This latter action is particularly important in order to demonstrate the organization's commitment to reducing risk.

RECOMMENDED SCHEDULE FOR RCA MEETINGS

Before 1st MEETING	1ST MEETING	2ND MEETING	3RD MEETING
Assign or appoint Team Leader	Explain RCA	Prioritize Factors	Review Literature and Benchmarks
Designate team members	Review the incident and identify the proximate cause	Develop Contributory Factors Diagram	Evaluate Solutions and Barriers
Select staff to serve as facilitator and note-taker	Review Sequence Analysis	Identify Root Cause	Develop Recommen-dations
Clarify the issue	Compare to expectations	Brainstorm potential solutions	Review content for draft report
Assign tasks (e.g., sequence analysis)	Identify Contributory Causes	Identify Incidental Findings	
Collect information	Organize into Clusters and Categories		
Schedule meetings	Identify Incidental Findings		

Make sure ALL team members have an opportunity to review and comment on the draft findings and recommendations. Broad-based ownership of the final product will increase its acceptance and eventual success.

3 Adapting RCA to Evaluate DD System Deficiencies

Root Cause Analysis is designed for uncovering causative and contributory factors associated with a specific sentinel – or adverse – event. As noted earlier, it typically follows a relatively prescribed process that includes the formation of a team, gathering of documents and information related to the specific incident, completion of a sequence analysis (with flowcharting), brainstorming and literature review to identify potential factors and solutions, etc. While this process is well suited to the assessment of a specific event, the basic tenets and some of the analytic tools included in RCA can be readily adapted to yield valuable information about broader system failures as evidenced by multiple events or identified deficiencies (e.g., citations from a regulatory agency).

Through such adaptation RCA can help system administrators understand why established procedures have not been consistently followed. It can also help identify where the absence of structured processes have directly caused or contributed to a failure to meet practice standards or regulatory requirements.

The remainder of this paper will focus on adaptations to RCA that can assist system administrators and technical consultants carefully analyze and determine why a failure has occurred in delivering services and supports to people with a developmental disability.

7-Step Process

The following seven steps represent a recommended process for use by state MR/DD agencies that want to conduct a Root Cause Analysis for an identified system failure or deficiency. The specific nature of the issue under review and a variety of organizational characteristics (administrative structure, geography, resources, etc.) will undoubtedly influence the process. Consequently, it will be important to modify the recommended steps below in order to meet situation-specific demands.

1. **Identify and Clarify the Issue**. RCA is best performed on one issue or failure at a time. [Remember, it is a process that was originally designed to address a sentinel or adverse event.] RCA will not be effective if the there is an effort to analyze different issues (e.g., service planning and use of behavior modifying medication) simultaneously. Therefore, target and work on one type of failure or citation at a time.

2. **Assemble the Primary Review Team.** Agency leadership will need to identify a small group of leaders who are knowledgeable about the issue under study. The primary team should consist of a person familiar with the system being reviewed, and no more than two or three additional

agency leaders. Assign roles to each member of this primary team, to include a team leader, meeting facilitator, and "note-taker." Additional members will be added to the RCA team once sample cases are selected.

3. **Collect Policies, Procedures and Sample Documents.** The primary team should identify and collect relevant agency documents, including written policies, procedures, forms, data output reports, and other relevant documents that describe and provide information about the issue under study.

4. **Evaluate Policies and Procedures against Standards.** Once all relevant documents are assembled, the primary team should evaluate any written policies and procedures against established standards. This will usually involve a review of relevant literature and a careful reassessment of the regulatory requirements. The purpose of this exercise is to determine whether or not prescribed agency practice is consistent with minimal standards and regulatory expectations. If existing policy and prescribed practice is <u>not</u> consistent, provide recommendations for revising policies. In addition, it will facilitate later analysis if a simple flowchart is developed that can illustrate existing policy and procedural requirements as well as the process recommended by best practice and/or the regulatory agency. Look for any deviations between your prescribed process and these external expectations.

5. **Identify Sample Cases for Review.** Include all or some of the specific

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7-STEP PROCESS

1. **Clarify the Issue**
2. **Set up Primary Team**
3. **Collect Documents**
4. **Assess Policies against Standards**
5. **Select Sample Cases**
6. **Initiate Root Cause Analysis**
7. **Provide Findings and Recommendations**

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cases cited by the regulatory agency in your review sample. It is recommended that additional cases not utilized by the regulatory agency also be included in the review sample to assess how systemic the identified failure actually is. Keep the total number of cases small (maximum of 4 or 5), but attempt to make sure they are representative of the types of individuals served and settings/programs they are served in. Collect relevant documents for the cases that will be reviewed in the RCA.

6. **Initiate the Root Cause Analysis.** Once this preparatory work has been completed, you can begin the actual Root Cause Analysis by taking the following steps:

  a. **Expand the Review Team** to include personnel directly involved in or responsible for the sample cases. In order to maintain a manageable and efficient team, limit

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participation to no more than two additional people per case

b. **Explain the RCA process** at the first full team meeting. [Note: it will take between 2 and 3 meetings to complete each RCA. Most meetings will require 2-4 hours each, dependent upon the number of cases to be reviewed and the complexity of the issue.]

c. **Perform a sequence analysis** by asking agency staff to describe the activities they actually engaged in relevant to the issue under consideration (e.g., if service planning is the issue, have staff involved in each sample case describe exactly what they did, and when.) Develop simple flowcharts to illustrate and identify any differences.

d. **Compare what actually happened to the prescribed process.** Compare the sequence of events (what took place in your sample cases) to what your agency policy and procedure indicates "should" occur. Also compare what actually occurred to what accepted practice standards suggest. This comparison is not designed to "point fingers" or cast blame for noncompliance or inadequate policy development. It is important that the team leader therefore reconfirm that the RCA will help identify factors that have interfered

with or compromised the ability of personnel to institute good practice, if and when that is identified as a potential contributory factor to the system failure.

e. **Brainstorm potential contributory factors** that did or could have led to each failure or inability to follow policy requirements and/or minimum standards. Review the rules for brainstorming contained in Chapter 5 and have the team look at the Common Factors Checklist, also in Chapter 5, as a reference and aid in prompting consideration of a broad range of variables. Use the question "why?" over and over again to elicit ideas about what did or could have led to the failure.

f. **Identify incidental findings** or inefficient processes or activities that may not have directly contributed to the failure, but which should be further evaluated for possible revision. Make a separate list of these for later consideration by the agency.

g. **Organize the identified contributory factors into clusters**, using the categories contained in the checklist. A matrix or diagram can be used to organize the information. [Note: this is a good point to end the first meeting, notifying participants that they will be asked to "drill down" further at the next meeting to

uncover additional factors and begin to prioritize them.]

h. **Prioritize the already identified factors and continue brainstorming** to identify even more. This is the point at which the team leader should be relentless in pushing the team to ask *"Why did the failure occur?"* and *"How does each factor really contribute to the problem?"* Once you have exhausted all possibilities, have the team prioritize the identified factors, grouping them according to importance (e.g., most important to least important). You can use an *Affinity Diagram* (see Chapter 5) to facilitate this step.

i. **Identify the proximate cause,** or obvious reason for the system failure. In many instances this may reflect the fact that a staff member did not do something that was required or necessary to meet the regulatory requirement. [Note: you can identify the proximate cause at most any time during the RCA. If immediately known, document in the first meeting.]

j. **Develop a Contributory Factors Diagram,** to illustrate the relationships between the various factors you have identified. Focus on those factors that the team has rated as important. The *CF Diagram* basically sets up a hierarchy, with the system failure at the top, followed by the proximate cause, followed by the categories of contributory factors, each of which may contain multiple variables. Such a diagram will assist the team in understanding the relationships and relative importance of each of the factors they have identified, and may lead to some changes in priority and even additions to the list of contributory factors. Chapter 5 includes information about constructing a *CF Diagram*.

k. **Identify the root cause**, or most fundamental reason that led to the failure. This may require combining one or more of the discrete factors already identified. [Note: the completion of this step may represent a natural point to end the second meeting. Ask members to think about potential solutions since this will be the focus of the third meeting.]

l. **Brainstorm solutions and identify barriers** that could interfere with or obstruct the root cause and other contributory factors from taking place. Allow the team to come up with multiple solutions and barriers for each factor. At this point do not attempt to prioritize or evaluate the feasibility of any ideas that are offered.

m. **Review the literature and use benchmarking** to share with the team how other

organizations have solved the problem or structured their system to prevent the failure. Formal literature search and review is very helpful to gain an increased awareness of systems present across the country that address the same or a similar problem. It is also recommended that members of the primary team make an effort to call experts and colleagues in other states to gather additional ideas that can be shared with the entire team. [Special Note: www.qualitymall.org is a good source of information on best practices.] However you gather the information it will be important to share it with to the full team, to provide examples and prompt identification of additional approaches to solving the problems identified earlier in the RCA process.

n. **Evaluate and prioritize the solutions and barriers.** At this point the team should assess the potential effectiveness, feasibility and estimated cost of adopting the identified solutions and barriers. Approaches that are not practical (*e.g.,* have a significant cost or lengthy timeline) should be discarded, resulting in a prioritized list of solutions, and team selection of the "best" approach for each factor.

o. **Develop recommendations** that the team can propose to the state agency leadership.

p. **Prepare draft findings and recommendations** and circulate to all team members. Chapter 5 contains a sample *RCA Report Form* that can be easily adapted and serve as a useful format for summarizing essential information. Comments need to be provided in a timely fashion to expedite preparation of the final report. Make every effort to provide an opportunity for everyone on the team to review and "approve" the general findings and recommendations.

7. **Report Findings and Recommendations to the Agency Leadership.** After making necessary revisions, prepare a final written report. Whenever possible, schedule a formal presentation that is presented by the primary team members. Make sure you provide the rationale for your findings, and recognize any objections or problems that the leadership raises regarding timely and cost-effective implementation of any or all of the recommendations. Assist the leadership in modifying or adjusting recommendations to better fit their perceived needs and organizational issues.

RECOMMENDED SCHEDULE FOR RCA MEETINGS

1ST MEETING	2ND MEETING	3RD MEETING
Explain RCA	Prioritize Factors	Brainstorm Solutions and Barriers
Perform Sequence Analysis	Identify Proximate Cause	Review Literature and Benchmarks
Compare to Prescribed Process	Develop Contributory Factors Diagram	Evaluate Solutions and Barriers
Brainstorm Potential Causes for Failure	Identify Root Cause	Develop Recommendations
Organize Factors into Clusters and Categories	Identify Incidental Findings	Prepare and Review Draft Report
Identify Incidental Findings		

Make sure ALL team members have an opportunity to review and comment on the draft findings and recommendations. Broad-based ownership of the final product will increase its acceptance and eventual success.

4 References and Resources

References

Doing What Counts (2000). *Doing What Counts for Patient Safety. Federal Actions to Reduce Medical Errors and their Impact.* Washington D.C. Report of the Quality Interagency Coordination Task Force, February, 2000.

To access the report go to: http://www.quic.gov/Report/

hcpro's accreditinfo.com (2002). *Solve performance problems through root-cause analysis*. Hcpro's accreditinfo.com.

To access go to: http://www.accreditinfo.com/howto/hhh/solveperf.cfm

Hirsch & Wallace (2002). Hirsch, Kenneth A. and Wallace, Dennis, T *Theory, Philosophy and Justification for Root Cause Analysis in Healthcare Organizations: Why Bother?* Published at www.sentinel-event.com/theory.htm

Institute of Medicine (1999). *To Err is Human: Building a Safer Health System*. Washington D.C. National Academy Press.

To access the report go to: htttp:// www. nap.edu/books/0309068371/html

Morey (1994). Error Reduction as a Systems Problem. *In Human Error in Medicine*, Marilyn S. Bogner (Ed)., Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

ADDITIONAL RESOURCES

The following resources may provide additional assistance to readers wishing to learn more about root cause analysis.

www.rootcauseanalyst.com

www.patientsafety.gov

www.outsights.com/systems/rca/rootca.htm

www.clinicalrisk.health.vic.gov.au/rca.htm

www.accreditinfo.com/howto/HHH/howtoex.cfm

www.va.gov/ncps/causation.html

www.va.gov/ncps/tools.html

Andersen & Fagerhaug (2000). Andersen, Bjorn, and Fagerhaug, Tom. *Root Cause Analysis: Simplified Tools and Techniques*. American Society for Quality (ASQ), Milwaukee, WI.

Check Amazon.com or www.qualitypress.asq.org for information on ordering this book.

Opus Communications. *Sentinel Events and Root Cause Analysis: A Guide to Best Practices, revised*. 200 Hoods Lane, Marblehead, MA 01945.

Hirsch & Wallace (2001). Hirsch, Kenneth A. and Wallace, Dennis, T. *Step by Step Guide to Effective Root Cause Analysis*. Opus Communications, Marblehead, MA.

To order the book or review other materials published by hcpro, go to: www.orionhealthcare.com.

5 Tools and Techniques

Root Cause Analysis Teams should feel free to utilize a variety of techniques designed to facilitate the group work. The following tools and techniques are offered as examples of methods that have traditionally been helpful in facilitating a formal RCA. If team leaders are familiar with and more comfortable using alternative techniques, they should do so. Remember, the goal of RCA is a full and complete discovery. Any methods that assist in that endeavor can and should be utilized.

A FEW SPECIAL TOOLS & TECHNIQUES FOR FACILITATING ROOT CAUSE ANALYSIS:

5 Rules of Causation
Sequence Analysis
Flowcharting
Common Factors Checklist
Brainstorming
Affinity Diagram
Contributory Factors Diagram
Efficiency Diagram
RCA Report Form

5 RULES OF CAUSATION
Documenting Causal Relationships

The following rules are adapted from the National Council on Patient Safety (see www.patientsafety.gov/causation.html) and are designed to establish some standards for investigators when documenting causal relationships. Team leaders may want to share and discuss these "rules" prior to identifying the causes and contributory factors associated with a sentinel event or system failure.

1. **Causal statements should clearly show the "cause and effect" relationship.** Make sure the team clearly describes the linkage between the stated cause and the adverse event or outcome. Do not assume other members of the team, or the eventual readers of your report will be able to automatically understand the relationship. Spell it out. Describe how and why something led to a mistake.

2. **Do NOT use negative descriptors in causal statements.** Avoid using shorthand statements like "inadequate" or "poorly written." Include detailed explanations. Not only will these be more informative, but they are much less likely to be perceived as inflammatory.

3. **Each human error should have a preceding cause.** Most adverse events involve human error. The goal of RCA is to understand WHY the error occurred. Therefore, never simply list the error. Always dig deeper and document a corresponding cause or set of factors that allowed the error to occur in the first place. Remember, it is the cause of the error, not the error itself, that will generate productive solutions.

4. **Each procedural deviation should have a preceding cause.** Just like human errors, deviations from prescribed procedures are not directly manageable. Rather, you must understand what caused or contributed to the deviation. Sometimes a process will not be followed because the staff person was not aware of all the steps; other times it may be due to distraction or pressures to meet deadlines.

5. **Failure to act is not causal unless there is a clear duty to act.** Duty to perform exists when there are formal requirements, practice standards, or other established guidelines that clearly spell out what is required. If a staff member does not do something that leads to an adverse event, make sure there was a clear recognition in the system that there was a duty to perform the action. This will facilitate identifying realistic prevention strategies, including the need to establish written guidelines/ policies and/or specific staff training in an area.

SEQUENCE ANALYSIS
Identifying the Sequence of Events

RCA is a structured analytic process that requires careful and exacting review of events, processes, and activities that are associated with the issue under consideration. It is therefore important to avoid making "assumptions" when conducting a formal root cause analysis since what "should" have happened is very often different from what "actually did" happen. Sequence Analysis is an essential step since it provides the "raw" information that the team will use to gain an understanding of "what happened". The process is relatively simple and can be expedited if team members come to the first meeting with information prepared using a format similar to that illustrated below. Source data can come from investigation reports that have already been completed, notes and program logs, or written recollections from the people who were directly involved in the incident under consideration.

A Sequence Analysis is basically a listing, in chronological order, of what took place. The information from the sequence analysis can be put into a flowchart to provide a visual depiction of what transpired. This can improve understanding of the events and their relationships by the entire team. It can also be cross-referenced to what policy or procedure prescribes and/or what best practice standards recommend "should happen."

FORMAT FOR SEQUENCE ANALYSIS

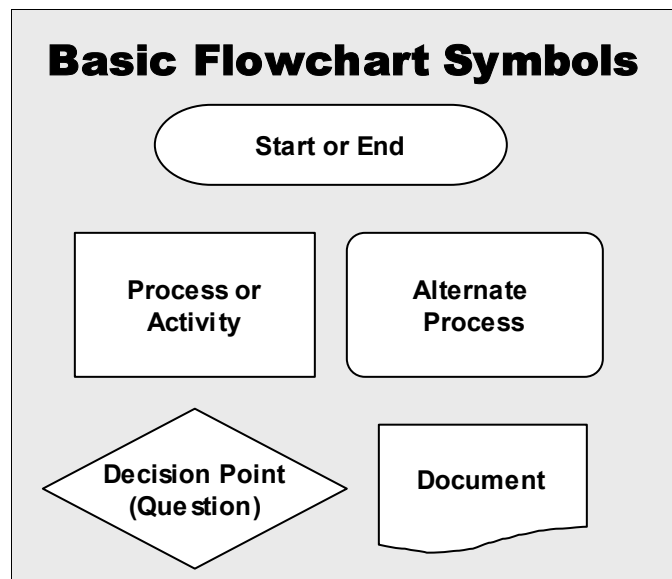| DATE	TIME	WHO	EVENT or ACTIVITY

FLOWCHARTING
Illustrating What Actually Happened

Flowcharts are visual representations of a process. By breaking the process down into its constituent steps, flowcharts are useful in identifying where errors have occurred or are most likely to be found in a system. Flowcharts can also help illustrate the relationships that do or should exist between different processes within a system, e.g., communication needs and patterns.

 The use of flowcharts can be a very powerful tool for the RCA team since the process of developing a flowchart leads to a common understanding of the issue and process, something that is useful not only for identifying potential causes of failure, but also for recognizing where in the system potential changes could prevent future failure. Flowcharts not only visually illustrate the sequence of events that led up to an adverse event or system failure, but they can help identify inconsistencies or weaknesses in prescribed processes (e.g., existing procedures) or proposed solutions. The use of flowcharts throughout the process of root cause analysis is therefore strongly encouraged.

While the fields of engineering and information systems design use a wide array of symbols to illustrate processes, RCA teams can begin using just a few basic symbols.

Basic Flowchart Symbols

Start or End

Process or Activity

Alternate Process

Decision Point (Question)

Document

COMMON FACTORS CHECKLIST
For Identifying Causes and Contributory Factors

When attempting to identify potential causes and contributory factors related to an incident or system failure review the following common factors. Place a checkmark next to each factor that was or may have been present and therefore influenced or caused the adverse incident or failure. Add additional factors discussed by the team.

STAFFING FACTORS

☐	**Workload**	*There were not an adequate no. of staff present to carry out the assigned duties in the expected timelines. The amount of work was not consistent with the duties and assigned tasks.*
☐	**Awareness**	*Staff were not aware of what tasks they needed to do and when those tasks were to be performed*
☐	**Staff Skills**	*Staff did not have the necessary skills and knowledge to perform the assigned duties – staff didn't know how to perform required tasks.*
☐	**Prioritization**	*Staff or supervisors did not set priorities for multiple tasks and responsibilities. Assumed priorities were not consistent with organizational expectations.*
☐	**Time Allocation**	*Staff did not set aside sufficient time to perform priority tasks within expected timelines.*
☐	**Working with Others**	*Staff were not aware of whom they needed to work with to perform tasks and work together as a team when required.*
☐	**Experience**	*Staff did not have necessary experience performing the task. If not experienced, they didn't know whom to access for direction and support.*
☐	**Supervision**	*Staff were not provided with consistent supervision from an assigned supervisor or peer network.*
☐	**Relationships with Other Staff**	*Staff did not have positive and mutually supportive relationships with other personnel. Conflicts or poor relationships interfered with the ability of staff to properly complete assigned tasks in a safe and/or efficient manner.*
☐	**Relationships with Consumers**	*Staff did not have a positive and supportive relationship with the people they were assisting.*
☐	**Motivation**	*Staff did not have incentives for performing the required activity, i.e., it was seen as unimportant or not recognized by the organization. There were no clear consequences for completing or not completing the activity.*
☐		
☐		

CONSUMER FACTORS

☐	**Adherence**	*Consumers did not adhere to treatment regimens on a consistent basis and/or were not provided with necessary prompts and other supports to assure compliance with critical aspects of their care.*
☐	**Awareness**	*Consumers were not aware of what tasks they needed to do and when those tasks were to be performed.*
☐	**Cognitive Ability**	*Consumers did not have the cognitive skills necessary to understand and complete required critical care activities when and if staff support was not available.*
☐	**Communication Ability**	*Consumers were not able to communicate needs and concerns that required staff assistance or intervention. Alternative and assistive communication systems were not in place to assure consumers could communicate.*
☐	**Physical Ability**	*Consumers did not have the physical ability to prevent the incident without staff or other support.*
☐	**Disease Complexity/Acuity**	*The medical and health status of the individual was complex and required close monitoring. The condition had rapid onset.*
☐	**Experience**	*The consumer was placed in a novel or unique situation. He or she was not familiar with the demands and risks of the situation.*
☐	**Supervision**	*The consumers level of need for support required the presence of supervision or observation during the activity or event that was not recognized or provided.*
☐		

COMMUNICATION

☐	**With Consumer**	*Staff did not have good communication with the consumer. Lack of adequate communication hindered awareness of a problem.*
☐	**With Family**	*There was inadequate or poor communication with the family or other knowledgeable persons. Poor communication reduced staff awareness of issues or risks.*
☐	**Among Staff**	*Staff did not communicate adequately with one another. Poor communication reduced awareness of risks or required activities.*
☐	**Inadequate Information re: Special Needs**	*Staff did not have or the record did not contain adequate information re: any special risks, concerns or needs of the consumer.*
☐	**Inadequate Information re: Proper Procedure**	*Staff did not have access to clear information re: the proper procedures or practices. Information, if available, was confusing or difficult to locate.*
☐	**Identification**	*Proper consumer identification procedures were not present*
☐		

EQUIPMENT & SUPPLIES

☐	**Poor Maintenance**	*Necessary equipment was not well maintained. Equipment was broken or did not operate properly due to lack of maintenance.*
☐	**Defective**	*Equipment was not properly designed or had defects in its manufacturing. The equipment was not assembled properly. Equipment was not used as intended.*
☐	**Not Available or Inadequate**	*Adapted or other necessary equipment was not available or was inadequate to the needs of the consumer.*
☐	**Inadequate Signage**	*Posted instructions or warnings were not available. Written instructions were not available.*
☐	**Medication Control**	*Medication was not properly controlled or stored. Access to medication was faulty.*
☐	**Food Control**	*Access to food and other edible items was not properly controlled. Food was not stored properly.*
☐	**Potency of Medication**	*The potency of medication was compromised and/or medication had exceeded its expiration date.*
☐	**Poor Labeling**	*Medications or other equipment or supplies were not labeled properly. Labels were confusing or incomplete.*
☐		
☐		

ASSESSMENT & PLANNING

☐	**Behavioral Assessment**	*Proper behavioral assessment, including risk to self or others, was not present or was inadequate.*
☐	**Physical Assessment**	*A physical assessment was not conducted properly.*
☐	**Medical Assessment**	*A timely and complete medical and health assessment was not conducted. Necessary supplemental tests were not performed.*
☐	**Planning**	*A timely and complete consumer planning process was not present. The planning process did not include essential components.*
☐	**Participation**	*The planning process did not include sufficient knowledgeable people.*
☐	**Timeliness**	*The assessment or planning process was not conducted in a timely fashion.*
☐		
☐		

POLICIES & PROCEDURES

☐	**No Policy**	*There was no formal written policy or procedure governing the activity. Staff were not able to reference agency guidelines or protocols.*
☐	**Contradictory Policy**	*Policies and procedures were inconsistent and contradictory. Verbal instruction was different from procedural requirements. Policies and procedures were not updated to reflect changes.*
☐	**Inadequate Policy**	*Policies and procedures were not complete, did not meet regulatory requirements, or were inconsistent with established standards and accepted practice expectations. Policies and procedures were not clear or concise.*
☐	**Communication and Awareness**	*There was inadequate communication re: new policy requirements. Staff and others were not aware of changes or revisions to policy or procedure.*
☐	**Employee Screening**	*There were inadequate policy requirements for screening employees. Individuals with established histories of behavior that could compromise consumer safety/care – including abuse and neglect - were working with consumers without special protections.*
☐	**Training**	*There were inadequate policy requirements for training. Staff were not required by policy to meet any minimum training requirements or demonstrate competency.*
☐	**Fiscal Control**	*There were inadequate or inconsistent policy requirements for the management and control of consumer funds.*
☐	**Assessment**	*There were inadequate policy requirements for proper assessment of consumer health, behavioral, and other critical support needs and preferences.*
☐	**Planning**	*There were inadequate policy requirements for proper consumer planning and revision of supports based on changing needs.*
☐	**Monitoring**	*There were inadequate policy requirements for monitoring services and supports to assure they are safe, meeting critical needs, and provided in accordance with consumer plans and agency requirements.*
☐	**Documentation**	*There were inadequate policy requirements for consumer records – including privacy – and documentation.*
☐		
☐		

ENVIRONMENT

☐	**Safety Codes**	*The physical environment did not meet established or required building or safety codes or standards.*
☐	**Improper Use**	*The physical environment was not designed or intended for the use to which it was put.*
☐	**Distraction**	*The environment was noisy and contained distractions that compromised the ability of staff to attend properly to tasks.*
☐	**Clutter**	*The environment was cluttered and impeded safe ambulation or movement.*
☐	**Line of Sight**	*The environment did not allow for needed line of sight to assure ongoing observation.*
☐	**Handicapped Accessible**	*The environment was not handicapped accessible and did not contain needed adaptations.*
☐	**Novelty**	*The consumer was placed in a novel or unique situation. He or she was not familiar with the demands and risks of the situation.*
☐	**Supervision**	*The consumers level of need for support required the presence of supervision during the activity or event that was not recognized or provided.*
☐	**Emergency Procedures**	*There were inadequate emergency procedures immediately available to staff. There was no emergency plan present to guide staff. Emergency numbers were not posted.*
☐		
☐		

ORGANIZATIONAL & LEADERSHIP FACTORS

☐	**Culture**	*The organizational culture did not emphasize safety or adherence to established standards. The culture did not support continuous improvement.*
☐	**Availability of Leaders**	*Leaders were not available to personnel. There were no established methods for sharing concerns or grievances.*
☐	**Structure**	*The table of organization or command structure was not clear. Staff were confused about who was responsible for what.*
☐	**Intimidation**	*There was an atmosphere of intimidation in the organization that hindered open communication. Staff perceived the presence of negative consequences for communicating problems or issues that required the attention of leadership or provision of resources.*
☐		
☐		

BRAINSTORMING
Generating Creative Ideas

Brainstorming is a widely used technique for generating a large number of ideas within a group of people. It requires an atmosphere of uninhibited and open discussion, where team members feel free to share even improbable ideas. Because brainstorming is very different from the usual process of analysis and discussion that takes place in a group, it is essential that the team leader explain the rules for brainstorming and note when the process is to begin and end.

RULES for Brainstorming:

1. ***Suspend Judgments*** – team members must not criticize or point out problems with other people's ideas.
2. ***Free Thinking*** – participants need to allow themselves to drift or freewheel. The group should encourage and support wild and even silly ideas.
3. ***More is Better*** – in the beginning you want to generate a large number of ideas. Encourage members to keep throwing out ideas quickly.
4. ***Cross-fertilize*** – participants should build upon the ideas of other members. Encourage slightly different "takes" on any given idea. Remember, the group owns the ideas, not any individual.

There are four different stages for the brainstorming session. First, the team leader should state the problem or issue (e.g., "What factors could have led to John leaving Jim alone"). Second, ask team members to restate the problem or issue using different words. After you have a number of alternatives, have the group select the one they believe will generate the best ideas.

The third step involves the brainstorming itself. Write down all of the ideas. Encourage members to open up and think freely. No discussion or criticism of any specific idea is allowed at this stage. Once this step is completed (usually about 15-20 minutes), go to the fourth and final stage, evaluation. During this last stage the group should discuss the ideas. Those that appear least promising should be eliminated. Then prioritize the remaining ideas.

If the brainstorming session was focused on identifying causes and contributory factors, the group could follow-up with the *Common Factors Checklist* to make sure they did not overlook any critical variables. Once the final list is identified, the group can use either the *Affinity Diagram or Contributory Factors Diagram* – or both – to help order the information and set the stage for further analysis.

AFFINITY DIAGRAM
Grouping Factors into Clusters

The process of brainstorming will usually result in a large number of ideas as to causes and contributory factors related to an incident or systems failure. Before proceeding with the identification of solutions it is usually much more productive to have the team cluster or group these ideas and factors into categories. The headings contained on the Factors Checklist represent one way of establishing meaningful clusters. The use of an affinity diagram can facilitate the actual placement of ideas and factors, and do so in a fashion that provides each team member an opportunity to participate in an equal fashion.

There are many different ways to execute this group process. One method that reduces the potential bias and influence of one or two more dominant team members involves the following steps:

1. Write down on index cards or "post-it" notes the causes and contributory factors that have been identified to date by the team.
2. Have team members get up and move the cards/notes around, grouping them into clusters that each member believes is most appropriate. [Usually the cards/notes will be moved a number of different times by different team members.]
3.   Have the team then discuss the groupings, making changes that reflect general consensus.
4. Reference the *Common Factors Checklist* and write down titles or headings for each of the groups or clusters.
5. Optional: based on discussion the team leader can draw lines between causes and factors that may influence or be related to other groupings.
6. Use the product to help shape *the Contributory Factors Diagram*.

EXAMPLE OF AFFINITY DIAGRAM

STAFFING ISSUES	ENVIRONMENT	COMMUNI-CATION	POLICIES & PROCEDURES
No Training	Limited Access to computer	No Documentation Of Action	Policy not Updated
Limited Supervisory Follow-up	Distraction in Workplace	Communicate schedule	Direction Contradicts Written Policy
Lack of Experience			
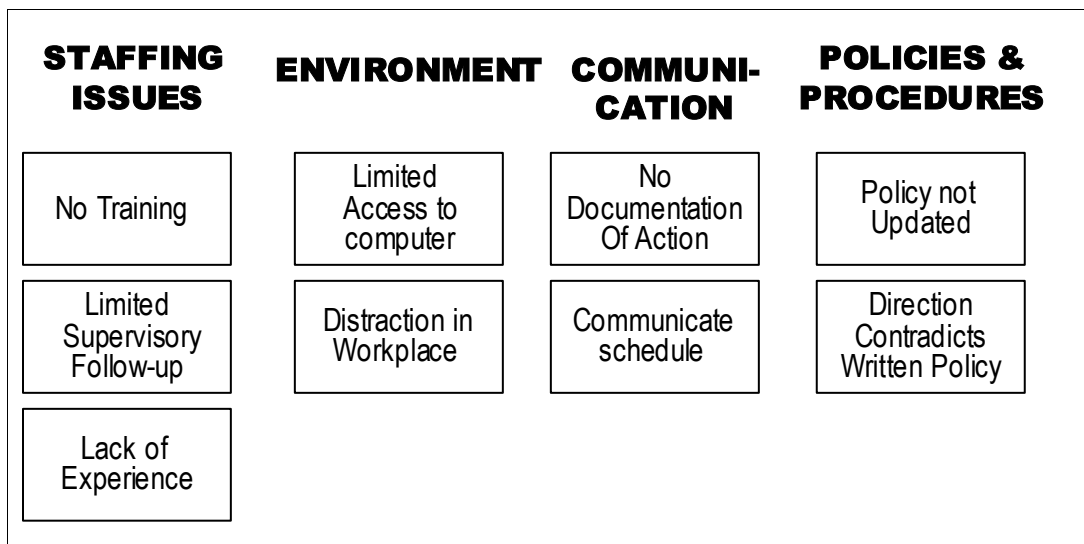
CONTRIBUTORY FACTORS DIAGRAM
Illustrating Relationships

The Contributory Factors Diagram may be used after completing or in place of the Affinity Diagram. This tool provides the team with a visual illustration of the inter-relationships between the adverse event or system failure, the proximate cause, and the identified contributory factors that led to the problem. Through the use of such a visual representation, the team can often more clearly recognize the root cause as well as begin the process of identifying potential solutions.

The development of a Contributory Factors Diagram can be accomplished in a number of different ways. Index cards or post-it notes can be used and placed on a board or wall chart, or the identified factors can be projected on a screen using a computer program (e.g., powerpoint) or transparencies. Whatever the specific method, the goal is to visually depict all of the major variables related to the issue under consideration so that the entire team can better understand how the variables relate to one another.

Note: RCA teams can substitute a Cause and Effect, or Fish Bone diagram for the Contributory Factors Diagram if they are more familiar with that technique.

Failure
The identified system deficiency or failure that is cited as an example of non-compliance with a regulatory requirement.

Sentinel Event
The adverse event or incident that is under investigation and analysis.

Proximate Cause
The most immediate or obvious reason for the system failure.

Contributory Factors
Systems deficiencies that led or contributed to the failure and proximate cause.

Group Cluster
Heading or label for a cluster of factors

Specific factor
Specific factor

Root Cause
The most basic and underlying cause – may represent a single specific factor or the culmination of a series of group contributory factors.

Group Cluster
Heading or label for a cluster of factors

Specific factor
Specific factor

Group Cluster
Heading or label for a cluster of factors

Specific factor
Specific factor

EXAMPLE OF A CONTRIBUTORY FACTORS DIAGRAM

Failure
No review or protective services plan following a major incident.

Proximate Cause
Case Manager did not review the incident report.

Contributory Factors
Systems deficiencies that led to failure and proximate cause

Root Cause
Systems to assure prompt follow-up to IRs not available

Staffing Issues
No Training in IR requirements
Limited Supervision
Lack of Experience

Environment
Limited computer access
Noisy workplace/distraction

Policy/Procedure
Old Policy- not updated
Verbal instruction contradicts policy
Lack of routing/triage protocol for IRs

Note: In most instances the CFD will be more complex than this example and will include many more factors.
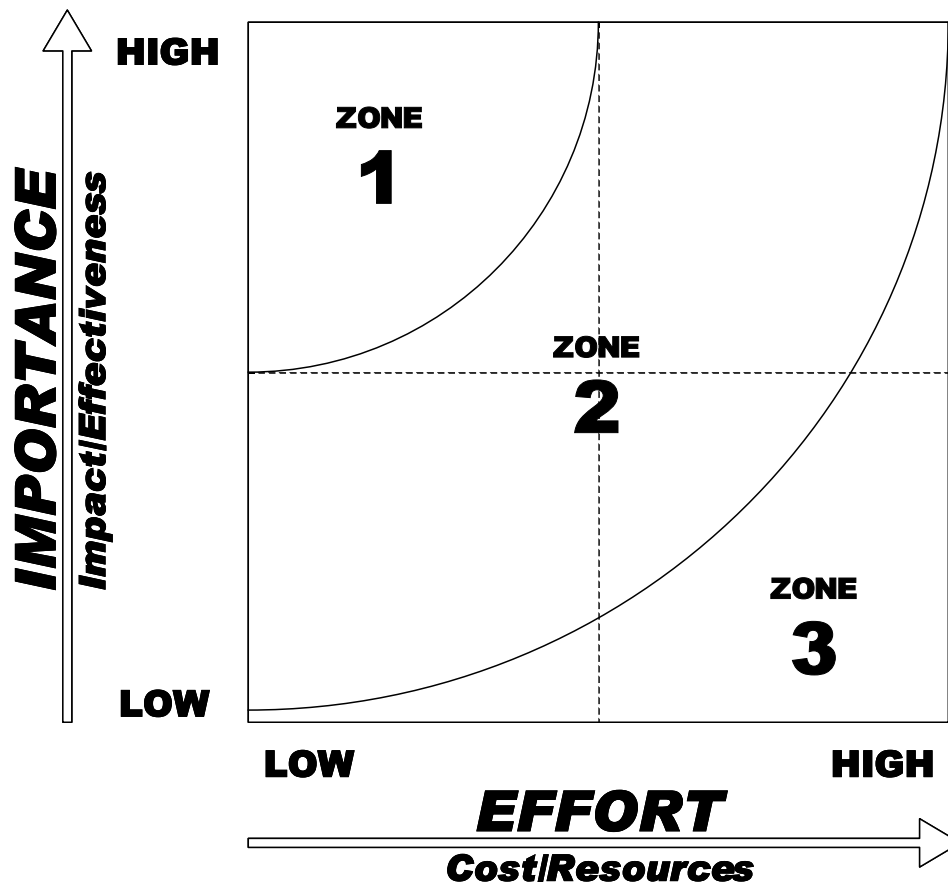
EFFICIENCY DIAGRAM
Selecting the Most Efficient Solution

Once the team has identified as many potential solutions as possible to the root
cause and/or primary contributory factors responsible for an adverse event or
systems failure, it is time to select those solutions that hold the most promise
of being efficient. "Efficiency" – as a concept – is represented by the relationship
between effectiveness and cost. Those solutions that have the greatest positive impact
(effectiveness) and the lowest cost (effort, time, or need for resources) are preferable to
solutions that have high cost and low impact.

The Efficiency Diagram is one method to structure this selection process. To use this
tool, have the team:
1. List all potential solutions or barriers that have been identified
2. Discuss the relative impact and cost of each idea
3. Plot each potential solution on the Efficiency Diagram
4. Rank order solutions/barriers
    1. Highest Priority = Zone 1
    2. Middle Priority = Zone 2
    3. Lowest Priority = Zone 3

Example of Efficiency Diagram
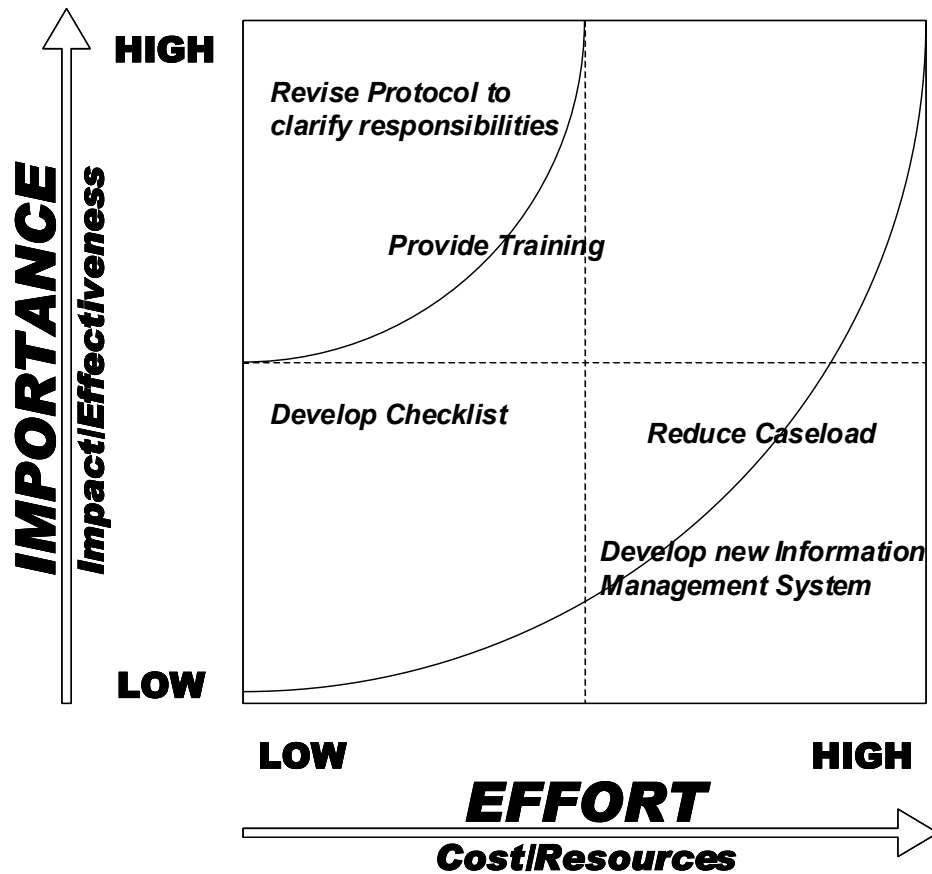
In this example the potential solutions would be rank-ordered as follows:
1. Revise Protocol *(most efficient)*
2. Provide Training
3. Develop Checklist
4. Reduce Caseload
5. Develop new IMS *(least efficient)*

Recommendations from the team would therefore focus on items 1-3 since these hold the greatest potential for success, as measured by importance (impact) and the effort or cost required for implementation.

ROOT CAUSE ANALYSIS REPORT FORM
Sample Format for Documenting Results of RCA

Adapted from a template utilized by the Australian Department of Human Services for use by
Health Care Organizations and Hospitals
[see http://clinicalrisk.vic.gov.au/rca/htm for original form]

<table>
<tr><td>AGENCY:</td><td colspan="2">Sentinel Event Reference No.:</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>City/Town:</td><td colspan="2">Date of Event:</td><td colspan="5">Date RCA Completed:</td></tr>
<tr><td>**1.**</td><td>**THE EVENT** *– Describe what happened and any harm that resulted. Identify the proximate cause, if known.*</td><td colspan="6">RCA Team Members:

Team Leader:</td></tr>
<tr><td>**2.**</td><td colspan="7">**BACKGROUND & FACTORS SUMMARY–** *Answer the following questions (brief summary only- attach supporting documents).*</td></tr>
<tr><td>2.1</td><td>What was the sequence of events that was expected to take place? Attach flowchart if available.</td><td colspan="6">Description:</td></tr>
<tr><td>2.2</td><td>Was there a deviation from the expected sequence?</td><td colspan="2">☐ Yes
☐ No</td><td colspan="4">If YES, describe the deviation. Attach flowchart if available.</td></tr>
<tr><td>2.3</td><td>Was any deviation from the expected sequence likely to have led to or contributed to the adverse event?</td><td colspan="2">☐ Yes
☐ No
☐ NK</td><td colspan="4">If YES, describe with causal statement.</td></tr>
<tr><td>2.4</td><td>Was the expected sequence described in policy, procedure, written guidelines, or included in staff training?</td><td colspan="2">☐ Yes
☐ No
☐ NK</td><td colspan="4">If YES, cite source.</td></tr>
<tr><td>2.5</td><td>Does the expected sequence or process meet regulatory requirements and/or practice standards? Cite references and/or literature reviewed by the team.</td><td colspan="2">☐ Yes
☐ No
☐ NK</td><td colspan="4">If NO, describe deviation from requirements/standards.</td></tr>
</table>

2.6	Did human action or inaction appear to contribute to the adverse event?	☐ Yes ☐ No ☐ NK	If YES, describe the actions and how they contributed.
2.7	Did a defect, malfunction, misuse of, or absence of equipment appear to contribute to the event?	☐ Yes ☐ No ☐ NK	If YES, describe what equipment and how it appeared to contribute.
2.8	Was the procedure or activity involved in the event being carried out in the usual location?	☐ Yes ☐ No ☐ NK	If NO, describe where and why a different location was utilized.
2.9	Was the procedure or activity being carried out by regular staff familiar with the consumer and activity?	☐ Yes ☐ No ☐ NK	If NO, describe who was carrying out the activity and why regular staff were not involved.
2.10	Were involved staff credentialed/skilled to carry out the tasks expected of them?	☐ Yes ☐ No ☐ NK	If NO, describe the perceived inadequacy.
2.11	Were staff trained to carry out their respective responsibilities?	☐ Yes ☐ No ☐ NK	If NO, describe the perceived inadequacy.
2.12	Were staffing levels considered to have been adequate at the time of the incident?	☐ Yes ☐ No ☐ NK	If NO, describe why.
2.13	Were there other staffing factors identified as responsible for or contributing to the adverse event?	☐ Yes ☐ No ☐ NK	If YES, describe those factors.
2.14	Did inaccurate or ambiguous information contribute to or cause the adverse event?	☐ Yes ☐ No ☐ NK	If YES, describe what information and how it contributed.
2.15	Did a lack of communication or incomplete communication contribute to or cause the adverse event?	☐ Yes ☐ No ☐ NK	If YES, describe who and what and how it contributed.

2.16	Did any environmental factors contribute to or cause the adverse event?	☐ Yes ☐ No ☐ NK	If YES, describe what factors and how they contributed.
2.17	Did any organizational or leadership factors contribute to or cause the adverse event.	☐ Yes ☐ No ☐ NK	If YES, describe what factors and how they contributed.
2.18	Did any assessment or planning factors contribute to or cause the adverse event?	☐ Yes ☐ No ☐ NK	If YES, describe what factors and how they contributed.
2.19	What other factors are considered relevant to the adverse event?	Describe:	
2.20	Rank order the factors considered responsible for the adverse event, beginning with the proximate cause, followed by the most important to less important contributory factors. Attach Contributory Factors Diagram, if available.		

	Was a root cause identified?	☐ Yes ☐ No ☐ NK	If YES, describe the root cause.

3.	**RISK REDUCTION ACTIONS TAKEN** – List the actions that have already been taken to reduce the risk of a future occurrence of the event under consideration. Note the date of implementation.

Action Taken - Description	**Date Implemented**

4.	**PREVENTION STRATEGIES** – List from highest priority to lowest priority the recommended actions designed to prevent a future occurrence of the adverse event. Begin with a rank of 1 (highest). For each strategy or action provide an estimated cost, if known, and any additional considerations or recommendations for implementing the strategy (e.g., phase-in, immediate need, triage by risk).

Rank	Strategy	Estimated Cost	Special Considerations
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

5	**INCIDENTAL FINDINGS** – List and describe any incidental findings that should be carefully reviewed for corrective action.
5.	**APPROVAL** – After review of this summary report, all team members should notify the team leader of either their approval or recommendations for revision. Following all revisions the report should be signed by the team leader prior to submission.

Signature of Team Leader:	Date Signed:

The information contained in this report will remain confidential and is intended solely to promote safety and reduce consumer risk.

Forward this report to all RCA team members and to the following individuals:

Name	Title	Organization	Address	Email