



Learning From Mistakes and Near Mistakes: Using Root Cause Analysis as a Risk Management Tool

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ABSTRACT: A concept with its origins in aeronautics provides an excellent source of information to prevent future adverse events. A properly conducted root cause analysis investigation can prevent future adverse events and decrease potential liability for health care providers. This article will provide an overview of the process of root cause analysis and discuss its importance in improving quality of care. (*J Radiol Nurs* 2015;34:4-7.)

KEYWORDS: Root cause analysis; Adverse events; Sentinel events.

INTRODUCTION

In its most basic form, root cause analysis is a structural manner of considering and analyzing serious adverse events. Initially, the concept of root cause analysis was used as an error analysis tool by the airline industry to determine the ultimate cause of a collision or near miss. This method of considering adverse events has now enjoyed widespread usage as a tool in numerous industries including health care. The most basic tenant of root cause analysis is to focus on system-based factors that increase the likelihood of an adverse event while avoiding the tendency to blame specific individuals for the adverse event.

When a sentinel event is identified, a root cause analysis must follow a specific protocol including data collection and reconstruction of the event that caused the adverse event. When done in a prescribed systematic manner, a root cause analysis can serve to prevent future harm by eliminating those factors that contributed to or promote the adverse event (Wu, Lipshutz, & Pronovost, 2008).

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WHAT IS A SENTINEL EVENT?

The Joint Commission (TJC), which accredits and certifies health care organizations and programs on safety and effective care, defines a sentinel event as being “an unexpected occurrence involving death or serious injury or psychological injury, or the risk thereof.” TJC goes on to define the phrase “or the risk thereof” to include any “process variation for which a recurrence would carry a significant chance of a serious adverse outcome.” These events are referred to as sentinel because they signal the need for a facility to initiate an immediate investigation and respond to the occurrence (Anonymous, 2014a). Moreover, TJC has a voluntary process whereby the credited organizations self-report sentinel events. Additionally, there is a complaint process whereby employees of the organization or patients and families can also report sentinel events.

Although there is much confusion regarding terminology, a sentinel event and a medical error are not synonymous (Woloshynowych, Rogers, Taylor-Adams, & Vincent, 2005). Pursuant to the definition of a sentinel event, a process variation in a health care facility that did not result in a medical error or injury (a near miss) falls into the definition of sentinel event and necessitates that a health care facility investigate and develop a root cause analysis to prevent a serious injury in the future. All medical errors are sentinel events, but the converse is not true.

For example, an operating room is stocked with both sterile tongue depressors and nonsterile tongue depressors as part of its available devices. A circulating

nurse has on several occasions used a nonsterile tongue depressor for intraoperative care. Although no intraoperative infections were traced to this breach of care, a root cause analysis investigation should be instituted to minimize the risk of future harm.

INITIATING THE ROOT CAUSE ANALYSIS APPROACH TO SENTINEL EVENTS ROOT CAUSE ANALYSIS

When a sentinel event occurs, institutions have varying policies and procedures as to how soon the technique of root cause analysis should be commenced. In general, the analysis should begin as soon as possible while memories are still fresh.

Root cause analysis is a method of problem solving that attempts to identify the most rudimentary cause of the fault or problems that occurred (Huston, 2014). The philosophy behind root cause analysis is that only future problems can be averted by identifying and correcting the root cause of events as opposed to simply addressing their symptoms. If only symptoms are addressed, the problems will most certainly reoccur resulting in patient harm (Bagian et al., 2002).

Each health care entity should have a systematic method of reviewing sentinel events using a root cause analysis approach. By thoroughly analyzing, in a nonjudgmental way, those factors that permitted the sentinel event to occur, alterations to the environment can be made.

In general, the three basic types of causes are as follows: 1) physical causes—tangible material items that failed in some way (e.g., the physical failure of equipment in the radiology suite); 2) human causes—personnel in some fashion—did something incorrectly or did not do something that should have been done; and 3) organizational causes—the policy or procedure used by personnel was in some way flawed (Huston, 2014).

An effective root cause analysis will consider all three types of causes and ascertain the flaw in each of these areas. Many times, a properly conducted root cause analysis will reveal that there is more than one root cause to the problem.

THE ROOT CAUSE ANALYSIS STAGES

The first step to an effective root cause analysis process begins with identifying the problem. This includes a complete non-emotionally charged definition of the process identified resulting in the sentinel event. Additionally, specific symptoms of the problem that may not be related to the specific sentinel event should be considered. For example, a near medication accident leading to the identification of a sentinel event may include a discussion of other problems related to medication administration that did not rise to the level of a

sentinel event. Another example of this might be a patient fall from an inadequately locked gurney in the radiology suite that could generate discussion of other instances where the patient did not fall yet, came close to a physical accident as a result of the same problem with the locking mechanism.

Step 2 of an effective root cause analysis begins with thorough collection of data. Depending on the actual incident, data should be collected from a variety of sources including any employees with actual knowledge of the sentinel event at issue, those with knowledge of other problems in the same area of practice, individuals with knowledge as to how long the problem existed, and all individuals involved who understand the impact of such a problem. Other data such as medical records and radiologic images should be analyzed where appropriate.

Step 3 of the root cause analysis process identifies the possible causal factors that may have resulted in the sentinel event. This analysis includes consideration of the sequence of events leading to the problem, considers the conditions that promoted the problem, and considers the identification of as many causal factors as possible. Rarely are there only one or two causal factors that result in a sentinel event. After numerous causal factors are properly identified, it is critical that each one be broken into small easily considered parts to understand their exact role in the sentinel event. These various components are placed in a cause and effect diagram in a systematic manner to assist in planning (Figure 1).

Step 4 includes the recommendations and implementations of the information gained by use of the root cause analysis diagram to prevent the problems from happening in the future. Implementation should occur as soon as practical to prevent others harm. This stage should include a specific plan for how the implementation should occur. It should also clearly identify the responsible individuals for such implementation. The risks inherent in the recommended solutions should also be considered (Smetzer, Baker, Byrne, & Cohen, 2010). For example, solutions to the proposed danger could provide new challenges or even different risks that, if possible, should be anticipated. For example, the presence of poorly functioning wheelchair brakes in the radiology suite may be an identified problem linked to the injury of a patient. Once this problem is fixed, the fully functioning brakes could result in patients attempting to unlock the brakes themselves and injure their hands in the process. Many times risks inherent to the solutions will not be obvious until after the implementation.

The entire risk management analysis process should be spearheaded by a small committee with in-depth knowledge of the clinical area involved in the sentinel event. It should also include any practitioner who was directly involved in the incident leading up to the sentinel event.

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