The Root Cause Analysis in Response to a Sentinel Event

Eugenie Heitmiller, MD
Associate Professor of Anesthesiology and Pediatrics
Johns Hopkins University School of Medicine

Objectives: Upon completion of this lecture, the participant will be familiar with the JCAHO requirements for investigation of sentinel events, including the definition of a sentinel event and how a root cause analysis is conducted and conclusions implemented.

Sentinel events are a subset of medical adverse events. Events that are considered "sentinel" are those that send a signal or warning that immediate attention is needed. A sentinel event is defined by the Joint Commission on Accreditation of Health Care Organizations (JCAHO) as an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. (Injury is defined here as the loss of limb or function not related to the natural course of the patient's underlying condition or illness.) The JCAHO expects health care institutions to develop their own Sentinel Event Policy. Such a policy would focus attention on underlying causes and risk reduction. The goal of the policy is to increase the general knowledge about sentinel events, their causes and prevention. This is seen as a way to have a positive impact on patient care as well as to maintain public confidence in the accreditation process.

Sentinel events identified by the JCAHO are:

- Suicide of a patient receiving around-the-clock care
- Infant abduction or discharge to the wrong family
- Hemolytic transfusion reaction involving administration of blood or products with major blood group incompatibilities
- Surgery on the wrong patient or body part
- Medication error resulting in major permanent loss of function or death
- Patient fall resulting in major permanent loss of function or death
- Perinatal death of an infant weighing more than 2500 g unrelated to a congenital condition
- Intrapartum maternal death
- Assault, homicide, or other crime resulting in permanent loss of function or death
- Any unauthorized departure of a patient from an around-the-clock care setting resulting in a temporally related death (suicide or homicide) or major permanent loss of function

Health care organizations can add their own examples of sentinel events that do not necessarily have to be reported to the JCAHO. At my institution, for example, we have added "an unintentionally retained foreign body" to the list of what qualifies as a sentinel event.

Historically and from the literature, there are on average 10 – 20 sentinel events per hospital per year. The JCAHO reviewed 2405 sentinel events between January 1995 and December 2003. The reporting of sentinel events to the JCAHO is on a voluntary basis. Many sentinel events are investigated within an institution and not reported to the JCAHO. Health care organizations are expected to have information about investigations of sentinel events available to the JCAHO when site visits are made.

Real life examples of sentinel events that have been published in the lay press:

- A child underwent a tonsillectomy instead of strabismus surgery due to mistaken identity.
- A child died after being struck by an oxygen tank pulled into an MRI scanner.
- Death due to hyperkalemia in a child receiving home TPN with a potassium concentration that was erroneously too high.

The JCAHO publishes a great deal of information about sentinel events on their website: www.jcaho.org. They also send out Sentinel Event Alerts that are available to all health care providers and organizations as a means of increasing the general knowledge about sentinel events. These Sentinel Event Alerts include the root causes of the type of sentinel event and how to prevent them. The following is a list of the Sentinel Event Alerts to date that are relevant to the anesthesiologist and intensivist:

1. February 1998: Medication Error Prevention – Potassium Chloride
2. August 1998: Wrong Site Surgery
3. November 1998: Inpatient Suicide
4. April 1999: Restraint deaths
5. August 1999: Infant Abductions
6. November 1999: Blood Transfusion Errors
7. November 1999: High-Alert Medications and Patient Safety
8. February 2000: Operative and Post-Operative Complications
9. July 2000: Fatal Falls
10. November 2000: Infusion Pumps – Preventing Future Adverse Events
11. February 2001: Medication Mix-ups Leading to Errors
12. May 2001: Look-alike, Sound-alike drug names
13. July 2001: Medical Gas Mix-ups
14. August 2001: Preventing Needle Stick and Sharps Injuries
15. September 2001: Medication Errors Related to Potentially Dangerous Abbreviations
16. February 2002: Preventing Ventilator-related Deaths and Injuries
17. June 2002: Delays in Treatment
18. September 2002: Bed Rail-related Entrapment Deaths
19. January 2003: Infection Control Related Sentinel Events
20. June 2003: Preventing Surgical Fires

At my institution, the Sentinel Event Policy requires that there be a Sentinel Event Group that performs the initial review on any case that may meet the criteria for a sentinel event. This group includes: the Chief Legal Counsel for the Hospital, the Vice President for

Clinical Affairs, the Chairman of the Hospital Risk Management Committee and the Vice President for Nursing. This Sentinel Event Group convenes within 24 hours of knowledge of the event and decides whether the case meets sentinel event criteria.

If the event is determined to be a Sentinel Event, a Root Cause Analysis team is assembled and is expected to review the case and develop an action plan to be delivered to the Hospital Leadership within 45 calendar days of notification of the event. This root cause analysis team is multidisciplinary, the members being members of the relevant departments, but not involved with the event. A facilitator from the legal office arranges meetings, keeps minutes and writes up the final report. The charge of the root cause analysis team is to explore all potential causes of the event, sort and analyze these causes, identify risk reduction strategies, and implement a correction plan with a timeframe for completion and monitoring.

The Root Cause Analysis (RCA) is a process for identifying the basic or causal factors that underlie variation in performance. It should focus primarily on systems and processes, not on individual performance. In order to get to the root of the problem, it is important to keep asking the question "Why?" The goal is to identify potential improvements in processes or systems that would tend to decrease the likelihood of such events in the future.

In carrying out a root cause analysis, it is helpful to re-create the event with the staff involved in the event. Members of the RCA team observe and question the staff involved. Questions to be answered include:

- What happened?
- Who was involved?
- Where and when did the incident occur?
- Where any policies or procedures involved and were they breached?
- What were the conditions of the area involved regarding staffing, general environment, availability of equipment, supplies and communication?

This usually requires several one-to-two hour meetings to discuss the event and to review policies and current practice. The results of the RCA team are then given to the Hospital leadership. The results summary should include details of event, the areas and service impacted and address:

- Human error
- Equipment breakdown
- Controllable environmental factors
- Uncontrollable external factors
- Patient Care Processes
- Human Resource Issues
- Information Management Issues
- Environmental Management Issues
- Leadership Issues
- Uncontrollable Factors

The knowledge gained from the RCA is used to educate the staff. This education should include engaging the staff in discussions and participation in the development and implementation of practices or policies to reduce the risk of a similar event in the future. A plan for monitoring the effectiveness of new systems or procedures should be included as part of the plan.

References:

1. The best source for information on Sentinel Events and resources for conducting a Root Cause Analysis can be found on the JCAHO website: www.jcaho.org
2. Root Cause Analysis in Healthcare: Tools and Techniques, 2nd Edition. Joint Commission Resources, 2002.