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# Taking Root Cause Analysis to the Next Level: From Rearview Mirror to Looking Out the Front Window

**In the 1940s, Japanese businessmen developed the basic elements of the tools and techniques that healthcare risk managers use today in assessing, evaluating, and mitigating unanticipated events. Taiichi Ohno, considered the father of the Toyota Production system, introduced the "5 whys," as a guide for digging at least five levels deep when attempting to solve any problem.**

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Dr. Kaoru Ishikawa, an influential quality-management innovator from the University of Tokyo, devised the "cause & effect diagram." This is usually called the "fishbone diagram" today, and it helps hospital risk managers home in on the contributing root causes that culminate in unanticipated events. Sakichi Toyoda, founder of Toyota Industries Company, Limited, is recognized as the father of the Japanese industrial revolution, and of the basic concept, "root cause analysis" (RCA). Toyoda applied RCA in the engineering process, to prevent the recurrence of any problems that had emerged in the company's production process.

Now, fast-forward to 1996 and The Joint Commission's (TJC's) implementation of the Sentinel Event Policy (SEP). The SEP focused on helping healthcare organizations identify and prevent unanticipated events in a healthcare setting that could potentially result in death or serious physical or psychological injury to a patient. A critical component of the TJC's policy, as you've probably already guessed, is RCA.

Here, we describe the evolution of RCAs at medical institutions, by using just one example, the new Root Cause Analysis Information Exchange (RCAIE) established by CRICO's Academic Medical Center Patient Safety Organization (AMC PSO).

## Standardizing RCA input

Over the years, industries across the world have come to recognize the power of collecting data in a standardized format. In the insurance industry, The Association for Cooperative Operations Research and Development (ACORD) has fostered the development of open-consensus data standards and standard forms. The Patient Safety and Improvement Act of 2005 encouraged the voluntary and confidential reporting of adverse events by hospitals, doctors, and other healthcare providers to Patient Safety Organizations (PSOs). As a result of this national initiative, the Agency for Healthcare Research and Quality created Common Formats and the Network of Patient Safety Databases (NPSD), to promote the use of common data definitions and elements for collecting and aggregating the essential elements of patient safety events that are voluntarily submitted by PSOs and providers. The patient safety professionals at CRICO also recognized the importance of standardizing the data captured during the performance of the RCAs done by all of the PSOs, nationwide. It is widely known that there are a number of challenges with the RCA process, as it is done today. First, there are no standardized definitions across organizations and, at times, within different departments of the same organization that performs the RCAs. Second, data is not captured in a standard format (e.g., Excel, Word, handwritten notes, etc.) that can allow RCAs to be effectively analyzed by each hospital. Finally, absent standardized data, it is nearly impossible to analyze and benchmark the findings that emerge from RCAs across multiple organizations—now possible through the auspices of a PSO. Given this lack of consistency, healthcare organizations and PSOs can find it difficult to aggregate the data needed for critical insights into what happens when risks converge and compromise care, and, based on

**Root Cause Analysis is a process for identifying the factors that underlie variation in performance, including the occurrence or possible occurrence of a sentinel event. A root cause analysis focuses primarily on systems and processes, not on individual performance. The analysis progresses from special causes in clinical processes to common causes in organizational processes and systems and identifies potential improvements in these processes or systems that would tend to decrease the likelihood of such events in the future or determines, after analysis, that no such improvement opportunities exist.**

Source: http://www.jointcommission.org/assets/1/6/2011_CAMH_SE.pdf

these insights, develop early-warning indicators of the specific vulnerabilities within systems.
To address these issues, CRICO created its RCAIE. With this tool, investigators focus on capturing data by answering these five questions:

- What happened?
- Who was involved?
- When did it happen?
- Why did it happen?
- How can we prevent it?

The RCAIE uses standard definitions and structures, and it codifies data at the source of input. The definitions were based on industry standards, a review of the patient safety literature, and a consensus from an RCA work group, which included representatives from hospitals, physicians, and chief quality officers, as well as the front-line staff who are responsible for conducting and reporting the results of root cause investigations.

The RCAIE is a Web-based tool that follows the RCA procedure that healthcare professionals are accustomed to. Data is captured in a predetermined, structured format using dropdown menus and CRICO's coding taxonomy, the same taxonomy that is used to code their medical professional liability (MPL) claims data. Most important, the RCAIE helps healthcare professionals track each root cause investigation, identify the contributing factors and system failures associated with the event, and note the actions taken in response to these incidents. The actions can be followed in detail, to the end points of completion and assessment of effectiveness.

**"Customization should be five per cent, not ninety-five per cent, of what we do."**

**—John Wright**
Brigham and Women's Hospital, Department of Orthopedic Surgery

Source: http://www.newyorker.com/reporting/2012/08/13/120813fa_fact_gawande

## Benefits of standardizing RCA input across organizations

**Ease of use.** Healthcare professionals have precious little time—what with treating patients, completing rotations, navigating crowded emergency rooms, updating electronic medical records, and coping with exhausting shifts—to have much of it left for completing RCAs. Healthcare professionals may be overwhelmed by all that is required to comply with regulatory and contractual reporting requirements like those in the Agency for Healthcare Research and Quality's pay for performance (P4P) program, which offers financial incentives for meeting defined quality, patient safety, and efficiency standards. So it was essential to design an application that captures key adverse event information in a manner that fits into the workflow of the end-user.

**Credible data.** In this brave new world of "big data," the power of capturing and codifying data at the point of entry, across multiple organizations, cannot be underestimated. Standardized RCA input from multiple organizations, compiled for the first time, creates an RCA database for benchmarking, discovering trends across multiple organizations, and, in the future, applying advanced analytical techniques to identify the potential drivers of risk. As the database expands in size and statistical power, CRICO can begin to leverage its clinically coded claims database, and other internal and external third party databases, to pinpoint new insights that can help organizations reduce preventable harm and subsequent MPL claims. What is learned from the subsequent remedial actions can provide insights across multiple organizations, which can help in determining how to tailor these remedies to a particular culture and environment.

**Measuring the response.** In addition to pinpointing the areas that entail the highest risk, the RCAIE can help in determining how well an organization responds in adverse events. Were the actions that were taken coordinated? Were they considered strong or weak? Do they address the vulnerabilities clearly? When stronger remedies are needed, major stakeholders may need to participate; when they are part of the effort, it is more likely that the desired change will actually come about. Oftentimes, actions are limited to revisions in policy or staff education and training. When the top managers in the clinical enterprise become involved, it helps everyone focus on developing solutions for mitigating harm, not just identifying the factors that contributed to the events. Benchmarking the effectiveness of action plans and RCA across organizations in healthcare is further enhanced if the RCAIE is hosted in a PSO.

**Standard training.** The AMC PSO conducted broad training in how to use the RCAIE tool with all of the risk managers and patient safety staff whose responsibilities included RCA investigations. The training was grounded in the simplicity of the Web-based tool and its close alignment with the RCA workflow that healthcare professionals were already familiar with.

## RCA Brought To Life

**In a recent Patient Safety Alert issued from CRICO's AMC PSO, we see the power of root cause analysis brought to life. In this issue, the RCAIE focused on medication safety issues in the intensive care unit (ICU) due to the treatment of critically ill patients that are at higher risk for adverse drug events for reasons including illness severity, complexity of care, the frequent use of drug regimens incorporating high alert medications, and the need for frequent drug dosing. Although recently adopted medication safety technologies such as computerized physician order entry (CPOE), bar code medication administration systems, and smart pump technology are showing significant impacts in decreasing risks associated with medication use, CRICO shared some ongoing risks and vulnerabilities based on RCAIE analysis. Risks and vulnerabilities included the interruption and distraction of nurses who often represent the "last line of defense" against medication errors, over-reliance on technology and not enough "critical thinking," and the need for constant updating of the drug library for smart infusion pumps.**

**After discussing the risks and vulnerabilities, the Patient Safety Alert shares a number of strategies for mitigating risk and improving medication safety. One example includes the creation of an environment that incorporates visual cues and physically designed areas that allow nurses to remain uninterrupted during the medication process (e.g., the "sterile cockpit," creating "no distraction zones," empowering clinicians to ask co-workers to manage interruptions). Another example includes leveraging educational strategies that can be placed at the bedside that detail all conversation rates to help prevent calculation errors, ensuring that specific information about medications, infusions, and drug allergies are clearly communicated during all hand-offs, and adding independent RN double-checks for high-risk and newly approved medications.**

## Conclusion

Admittedly, we are still in the early stages in exploring what is possible with the AMC PSO. But we are excited that organizations are now able to garner important information from the analysis of RCAs—at the level of the entire organization, as well as the individual line of service. Since it captures data that is consistently structured and codified, the AMC PSO can help in creating a broad picture of organizational risks and system vulnerabilities. The power of aggregation, and of insights gleaned from data analysis, coupled with the collective wisdom of shared experiences, helps in creating a powerful tool for advancing the nation's quest for a culture of safety.

If Taiichi Ohno, Dr. Kaoru Ishikawa, and Sakichi Toyoda were still alive, and able to use the RCAIE tool today, we think they would appreciate how their groundbreaking work of 70 years ago has paid off in dividends today, in the healthcare industry.

In an earlier four-part article ("Getting Better All the Time: The Decade-long Improvement in Patient Safety," *Physician Insurer,* First, Second, Third, and Fourth Quarter 2012), one of us [K.B.] chronicled the developments that, together, have paid off in significant gains in patient safety. Here, we have related the beginning chapter of yet another such chronicle. PIAA

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