TIPS

Root Cause Analysis: Bridging the Gap Between Ideas and Execution

By Dea Hughes, patient safety manager, VA New York Harbor Healthcare System

ROOT CAUSE ANALYSIS (RCA) is a process to describe in chronological and precise detail what happened during a close call or an adverse event, identify the root causes of that event, and most importantly, recommend corrective actions. But does the RCA execute as intended? Were corrective actions implemented? Did they work?

In February 2006, a project was completed at the VA New York Harbor Healthcare System to identify factors that influence whether RCA action plans were implemented and effective. (Note Table 1, back page) for the number of RCAs involved.

The main findings included:

♦ 39 percent of actions proposed were implemented.

♦ 74 percent of such actions were effective.

♦ Actions that involved stronger fixes were more likely to be implemented and effective than weaker ones.

Methods

All individual RCAs completed before October 2005 were categorized by event type using the NCPS Categorization Glossary. Fifty percent of the RCAs from each Event Type Category were randomly selected for follow-up and review.

Action plans in each RCA were reviewed, individual actions categorized, and the staff assigned to implement those actions were interviewed. The implementation and effectiveness status of each action was analyzed.

RCA Hierarchy of Actions

Actions can be thought of as stronger or weaker based upon their likelihood of reducing a vulnerability. Stronger actions include architectural modifications and engineering controls or interlocks. Weaker actions provide staff with additional information or new procedures to follow, but not a "hard fix" that can eliminate the vulnerability.

♦ Stronger — The action is more likely to eliminate or greatly reduce the likelihood of an event: uses physical plant or systemic fixes; applies human factors principles.

♦ Intermediate — The action is likely to control the root cause or vulnerability; applies human factors principles, but also relies upon individual action, e.g. checklist or cognitive aid.

♦ Weaker — The action relies on policies, procedures, and additional training.

RCA Actions – What Our Review Found

Of the 26 RCAs reviewed (note Table 2, back page), 119 actions were proposed: 25 involved writing or amending policies; 24 called for more training; 10 proposed standardizing a process or procedure.

Of the total actions proposed, 30 percent (n=36) were considered strong. In one case reviewed — an inpatient suicide attempt that involved a pipe — the stronger action recommended was to remove the exposed pipe and thus eliminate the hazard.

Nineteen percent of the proposed actions were intermediate fixes and 51 percent (n=60) were considered weaker actions.

In summary, 119 actions were proposed by 26 RCA teams. On average, that's 4.5 actions per RCA. Forty-nine actions (about 40 percent) were proposals to write policies or do more staff training. Half of the actions were stronger or intermediate fixes; half were weaker fixes.

Were Actions Implemented?

Forty-six actions were fully implemented, which is 39 percent of the total actions proposed:

♦ 25 percent (n=30) were partially implemented.

♦ 30 percent (n=36) were not implemented.

Table 3 (back page) shows the number of actions implemented and not implemented by action category.

Weaker actions were more frequently recommended, but less likely to be implemented:

♦ Four were policy actions; 16 percent of these proposed actions were implemented.

♦ Seven were training actions; 29 percent of these proposed actions were implemented.

Strong actions were recommended less frequently, but were more likely to be implemented:

♦ 100 percent of the recommended environmental control/change actions were implemented.

♦ 75 percent of actions recommended to standardize equipment were implemented.

On average, 1.8 actions were implemented per RCA. Also of note, RCAs in which 100 percent of the actions were implemented took the fewest number of days to complete. RCAs in which none of the actions were implemented took longer to complete.

Were the Actions Effective?

Thirty-four of the 46 actions implemented (74 percent) were either fully effective or partially effective. The majority of implemented and effective actions were strong actions, such as engineering changes or standardization of a process or a procedure. Actions were only partially effective if they were fully implemented at one facility, usually the facility where the RCA was conducted, but not at the other facility within our system. This was primarily due to a lack of information sharing, something we are working to overcome.

Specimen Management in the Laboratory — Opportunities for Improvement

By Ed Dunn, MD, MPH, NCPS director of policy and clinical affairs, and Carol Samples, NCPS program analyst

ON THE BASIS of reviewing RCA reports from 2000 to 2006, we observed a number of adverse events related to specimen management in the lab. This report summarizes our findings, identifies vulnerabilities, and offers recommendations to prevent similar adverse events.

Vulnerabilities Identified in Lab

We identified vulnerabilities in several processes of lab specimen management that led to specimen misidentification. Consequences for specimen misidentification in the lab included: four prostatectomies; delay in treatment of tumors or infections; medical treatment for the wrong patients; unnecessary diagnostic procedures; and unnecessary hospitalizations.

Specimen Labeling During Collection

We reviewed multiple cases of incorrect patient identification on laboratory specimens. For instance, phlebotomists used one printer, resulting in mixing one another's printed labels; specimens were batched in areas with pre-printed labels from different patients; and hand-written labels led to mislabeled specimens.

Accessioning Specimens in the Lab

In several cases, the accessioning process was described as a "one-man shop" in an open area of the lab with heavy traffic and multiple distractions, such as: people, phone calls and pagers.

Eight RCAs mentioned specimens labeled with incorrect accession numbers. Patients also received inappropriate blood transfusions, had prostate needle biopsies repeated, and unnecessary surgical and diagnostic procedures, including cardiac catherizations.

Manual Entry Lab Result Reporting

Manual entry of lab results to VistA using the first initial of the last name and last four digits of the SSN led to multiple cases of misidentification. This is not a unique identifier: many VA facilities have encountered patients with the same names and last four digits of the SSN. No system of VistA alerts has been developed when such data duplication occurs in the same health system. Examples included cancer diagnosis reports placed in the wrong patient record and positive blood culture reports for wrong patients, who then received multiple doses of antibiotics.

Delta Check values were not used on some of these cases. Delta Check technology is designed to draw attention to lab results at significant variance with historical values. If the values are significantly different than historcal values, the specimen may have been obtained from a different patient, and repeat studies would be required.

Tissue Processing and Labeling

Hand-written labels were commonly applied to specimen containers, tissue cassettes, and slides – all leading to misidentification. Tissue was also processed for multiple patients together with multiple pre-labeled slides on the same counter, causing mix-ups. Slides have also been labeled with wrong accession numbers — without a redundancy check for identification.

Outcomes included multiple repeat prostate biopsies and radical prostatectomy procedures.

Anatomic Pathology Reviews

Several cases included mislabeled anatomic pathology slides. In each case, slides from several patients were placed in a single cardboard slide holder tray. They were often labeled with accession numbers, but without patient names, providing no redundancy in identification. When a second pathologist review was required for cancer cases, this was either not done in a timely way or done without a second check on patient identification.

Examples of outcomes from cases related to anatomic pathology reviews included a radical prostatectomy procedure for the wrong patient and delays in treatment for cases of cervical cancer and melanoma.

Forms and Labels

For years, human factors-based vulnerabilities have existed in the reporting forms used by VA labs and blood banks. The SF-515 is a standard reporting form for labs that was last revised in 1997, has never been automated, and requires hand-written entries. This form includes small font size; minimal space for a final report; space for multiple accession numbers (potential for confusion); blank space in the lower left corner for addressograph label (no longer in use); data categories such as "sponsor," "rank," "grade," and "register-number"; a typo "parient" in lieu of "patient"; and a non-specific category for "signer" rather than pathologist.

The SF-518 form for VA blood banks was last revised in 1992 and has many of the same problems. Though bar codes will be used throughout VA for blood identification and administration, many blood product labels have no fewer than five bar codes, only one of which is a unique identifier.

Considerations for Improvement

In discussing our findings with VA lab medicine professionals, we developed a number of interventions to address such vulnerabilities:

1. Implement the Bar Code Expansion project for lab specimen labeling and blood product administration in the VA, scheduled 2007-09.

2. Map each lab accession number to the patient's full SSN.

3. Re-engineer the work area following human factors principles for lab personnel who apply accession numbers to incoming specimens, and for histotechnicians processing tissue specimens.

4. Eliminate hand-written labels in the lab.

5. Automate labeling of accession numbers and minimize re-labeling.

6. Label slides with patient name, accession number, and SSN.

7. Limit pathology review with slide holder tray to one case at a time.

8. Re-engineer pathology first and second reviews of cancer cases with forcing functions to prevent final reporting until the second review is completed.

9. Replace current dictation system for pathology reporting with electronic templates for data entry. Consider use of "voice recognition technology."

10. Standardize Delta Check applications in labs throughout the VA.

Communication Matters – Part III: Becoming Active Healthcare Citizens

By Amy Carmack, MA, NCPS education technician

BEING A PATIENT in the complex world of healthcare can be overwhelming and confusing. Gone is the era of "Dr. Ben Casey": days of singular conversations, limited questioning, and obedient patients. Patients can now be part of a fast-paced, interactive healthcare environment. Twenty-first century caregivers must rely equally on their ability to care for patients and on patients' interpretation of their treatment.

Poor communication between patients and providers has been linked to a myriad of costly consequences, such as misdiagnoses, the ordering of unnecessary tests, and a high incidence of patient failure to comply with treatment plans.[1]

However, patients also need to take responsibility for their healthcare decisions. As physicians Michael Roizen and Mehmet Oz point out: "Ultimately, you are the person most responsible for the success of your healthcare team."[2]

This final installment of our communication series will focus on the need and steps for patients to become "active healthcare citizens" and how caregivers can assist in this journey. We will also include the benefits both parties can garner as patients become more prepared, engaged, and responsible for their care.

Promoting Active Healthcare Citizens

Though there is no specific requirement to do so, patients should be encouraged to become involved in their treatment and plans of care. An active healthcare citizen is an individual who is *prepared, engaged, and responsible* for their health and care. Asking a patient to follow these three simple steps will create a new environment in which they can take charge of their healthcare.

This idea will also be in step with JCAHO's 2007 Patient Safety Goal 13, which discusses patient involvement in their care, as well as provides caregivers resources and strategies to get patients involved.

Preparing For An Active Role

Engaging in the healthcare process is the first step to becoming an active healthcare citizen. Patients should be encouraged to keep a health journal[2] and set up a personal health page on VA's HealtheVet (www.health-evet.va.gov) and use these as a basis to engage in an interactive conversation with caregivers. These tools can be used to record such things as: symptoms, hospital visits, treatments, procedures, and medications.

Being an active healthcare citizen also means being well informed. Patients should be encouraged to find out as much as possible about specific care issues by discussing them with a caregiver or by researching them through credible sources.

Engaging Patients in Their Health

A patient who is prepared to discuss issues is one who can ask meaningful questions about medications, procedures, and treatment plans — questioning what they are for, why they are needed, and how they might affect one's lifestyle, including any potential side-effects.

Health Responsibility

Research has found that only 15 percent of patients fully understand what their caregiver is telling them; 50 percent are unsure of how to implement care.[1] A patient should be encouraged to have a full understanding of what actions must be taken — which is why being well informed about their care plan is so important.

A patient should understand exactly what a caregiver expects should be accomplished, such as scheduling a consultation or following a medication regime: The worst action a patient can take is no action — being uninvolved.

The Healthcare Professional-Partner

One of the most important roles a caregiver can play is that of a partner and advocate of an active healthcare citizen. Encourage patients to speak up by developing an open communication style[3] and reducing communication barriers.

Partner Communication

As previously discussed in TIPS,[3] there are several communication styles that can be employed to disseminate information and build relationships. In particular, patients look for relationships that are built on trust, not just good medical advice.

Providing a forum for them to openly discuss their concerns can help develop an active healthcare citizen's awareness. Caring about what a patient has to say is one of the most important criteria for communicating with them.

Involving the Patient

Studies have found that the more balanced the relationship between provider and patient, the more likely the patient's health will improve.[1]

Answering all of a patient's questions, asking them to repeat back important information, and talking *with* patients, rather than *to them*, will encourage patients to become active in their healthcare — making them feel like an active healthcare citizen, not just another patient.

Breaking Down the Walls

When working with an active healthcare citizen, caregivers must be aware that a large communication barrier is time. Providers are ruled by tight schedules and a good healthcare citizen should understands this barrier.

Patients should be encouraged to bring their health journals and a list of questions to maximize their time. Providers should always ask what a patient needs to know *before* the end of a visit and prior to providing the patient with a medication reconciliation list. To effectively create a successful communication partnership, breaking down communication barriers takes work by all.

The Benefits of Being an Active Healthcare Citizen

Encouraging patients to take an active role in their health can improve relationships with caregivers, as well as improve their health. Research has found that there is a direct link between positive patient-provider relationships and active involvement and improvements in the quality of health.[1,4]

Patients have reported reductions in pain, improved emotional and physical health, reduced stress and anxiety, and a higher degree of compliance to prescribed treatments and medicine regimes.

Patients are actively involved in many aspects of their lives — why not encourage them be active in their healthcare too?

References

1. Levine, M. (2004, June 1). Tell the doctor all your problems, but keep it to less than a minute. The New York Times.
2. Roizen, M.F., & Oz, M.C. (2006). You: The Smart Patient. London: Free Press.
3. Carmack, A. (2006, September./October.). Communication matters – Part II: Provider-to-provider communication. Topics in Patient Safety, 6(4):3. (www.patientsafety.gov/TIPS/Docs/TIPS_SeptOct06.pdf)
4. Cukan, A. (2006, June 15). Caregiving: Talking to the doc – Part II. UPI.

Findings and Conclusions

♦ Stronger actions are easier to implement and are more effective than weaker actions.

♦ Actions that are assigned to specific departments or people are more likely to be implemented than those assigned to general areas.

♦ It is beneficial if RCA team members bring information back to their areas and initiate action implementation.

♦ The patient safety manager plays a critical role in RCA action implementation.

Moving Forward

To increase action implementation and effectiveness, we are working to instruct RCA teams to focus on stronger fixes — they're easier to implement and more effective. We have established a patient safety planning group, which is looking into a number of patient safety issues, such as how to better share lessons learned from RCAs with all staff. Such feedback should improve action implementation and monitoring.

We hope to establish a permanent Patient Safety Committee with representation from many areas, with a focus on RCA action implementation. We will continue to use JCAHO's tracer methodology to observe long-term implementation of actions.

Table 1: RCAs Reviewed by Year of Incident Occurrence

Year	2000	2001	2002	2003	2004	2005	Total
RCAs	3	2	6	2	7	6	26

Table 2: RCAs Reviewed by Event Type

Event Type	RCAs
Delay in Treatment/Diagnosis/Surgery	6
Misidentification	5
Falls	2
Inpatient Suicide/Parasuicide	2
Missing Patients	2
Assault	1
High Alert Adverse Drug Events	1
Outpatient Suicide/Parasuicide	1
Toxic Substance Ingestion	1
Unsterilized/Contaminated Exposure	1
Other	4
Total	26

Table 3: Total Number of Actions Proposed and Implemented by Action Type

Action Type	Number	Not Implemented	Implemented	Strong Actions
Policy/Procedure	25	21	4	
Training/Education	24	17	7	
Standardize Process (protocols, checklists)	10	5	5	X
Enhanced Documentation	9	6	3	
Software/Hardware	7	3	4	
Staffing/Scheduling/Assignments	6	4	2	
Environmental Control/Change	5	0	5	X
Eliminate or Substitute System/Device	4	1	3	X
Engineering Device or Interlock	4	2	2	X
Standardize Equipment	4	1	3	X
Analyze	3	3	0	
New Medical Device	3	2	1	X
Patient Scheduling	3	1	2	
Continuous Quality Improvement (CQI)	2	1	1	
Redundancy/Double Checks/Inspections	2	2	0	
Architectural/Physical Plant Changes	1	1	0	X
Auditory Warning	1	0	1	
Enhanced Information Display	1	1	0	
New Device	1	1	0	X
New Non-medical Device	1	0	1	X
Standardization	1	0	1	X
Supervision	1	1	0	
Work Area Redesign	1	0	1	X
Total	119	73	46	