Patients Count on It: An Initiative to Reduce Incorrect Counts and Prevent Retained Surgical Items

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ABSTRACT

Retained surgical items were the most frequently reported sentinel event in 2010, according to The Joint Commission. Perioperative nurse leaders at Children's Hospital Boston, a pediatric teaching hospital, conducted a quality improvement initiative to reduce or eliminate incorrect counts and count discrepancies, which increase the risk of an item being unintentionally retained after surgery. Work included educating the perioperative staff members, standardizing count practices, formally reviewing every reported count discrepancy with the nursing team, and reviewing and revising the count policy for prevention of retained surgical items. The initiative reduced the number of incorrect counts and count discrepancies by 50% between 2009 to 2010. These initiatives continue to be expanded, and the results have been sustained on an ongoing basis. *AORN J* 95 (January 2012) 109-121. © AORN, Inc, 2012. doi: 10.1016/j.aorn.2011.06.007

Key words: *retained surgical items, count discrepancies, incorrect counts.*

Incorrect counts, as well as count discrepancies, may lead to the unintentional retention of a surgical item after surgery, which may cause serious harm to the patient.[1] One report suggests that retained surgical items (RSIs) are 100 times more likely to occur in procedures in which there is a count discrepancy.[2] Prevention of RSIs has been identified by AORN, the American College of Surgeons (ACS), and The Joint Commission as a national patient safety priority.

In accordance with national initiatives, perioperative nurse leaders at Children's Hospital Boston, Massachusetts, conducted an OR quality improvement (QI) initiative to reduce incorrect counts and count discrepancies. This project included conducting extensive staff education, standardizing count practices, reviewing all reported count discrepancies, and revising the counts policy at Children's Hospital Boston. The results of this initiative surpassed our initial objective. Not only did we reduce the number of reported incorrect counts and count discrepancies, but we also improved the entire count process.

LITERATURE REVIEW

An RSI is a sentinel event, which is defined as "any unexpected occurrence involving death or serious physical or psychological injury or risk thereof."[3] Accredited hospitals may elect to report RSIs to The Joint Commission; however, the

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occurrence of sentinel events might also be made known through reporting in the newspaper, patient complaints, or reports to the state. Requirements for mandated reporting to regulatory bodies vary from state to state.

Retained surgical items resulting in death or permanent loss of function were identified by The Joint Commission as the most frequently reported sentinel event in 2010 through the second quarter of 2011.[4] Retained surgical items surpassed wrong patient, wrong site, and/or wrong procedure events, which were the most frequently reported events in 2008 and 2009 (Figures 1 and 2). The Joint Commission analyzed all sentinel events reported from 1995 to 2005 and found that miscommunication was the main contributing factor.[4]

Researchers have identified varying risk factors that lead to RSIs. For example, Rowlands and Steeves[5] conducted a qualitative analysis on incorrect surgical counts and discovered three common themes that represented challenges: bad behavior, general chaos, and communication difficulties. Bad behavior included "sloppy individuals, inconsistencies, lack of adherence, and no respect."[5(p413)] General chaos included disruptive activities such as loud music or excessive talking during critical moments of the count process, lack of a standardized orientation program, and assignment of inexperienced staff members to a surgical procedure. Communication difficulties included chatter that interferes with full attention to the surgical count, eroding collaboration within the surgical team, a rushed feeling during the counting process, and omission of critical information (eg, sponges intentionally packed in the surgical wound) during staff member hand offs.[5]

2009	2010	January 1, 2011 thru Second Quarter 2011
Wrong-patient, Wrong-site, Wrong-procedure	Unintended retention of a Foreign Body	Unintended Retention of a Foreign Body*
Delay in Treatment	Delay In Treatment	Op/Post-op Complication
Unintended Retention of a Foreign Body	Wrong-patient, Wrong-site, Wrong-procedure	Wrong-patient, wrong-site, wrong-procedure
Op/Post-Op Complication	Op/Post-op Complication	Delay In Treatment
Suicide	Suicide	Suicide
Fall	Fall	Fall
Other Unanticipated Event	Medication Error	Other Unanticipated Event
Medication Error	Other Unanticipated Event	Criminal Event
Criminal Event	Perinatal Death/Injury	Medication Error
Perinatal Death/Injury	Criminal Event	Perinatal Death/Injury

The Joint Commission

The reporting of most sentinel events to The Joint Commission is voluntary and represents only a small proportion of actual events. Therefore these data are not an epidemiologic data set and no conclusions should be drawn about the actual relative frequency of events or trends in events over time.

Figure 1. Joint Commission most frequently reviewed sentinel event categories by year. © The Joint Commission, 2011. *Reprinted with permission.*

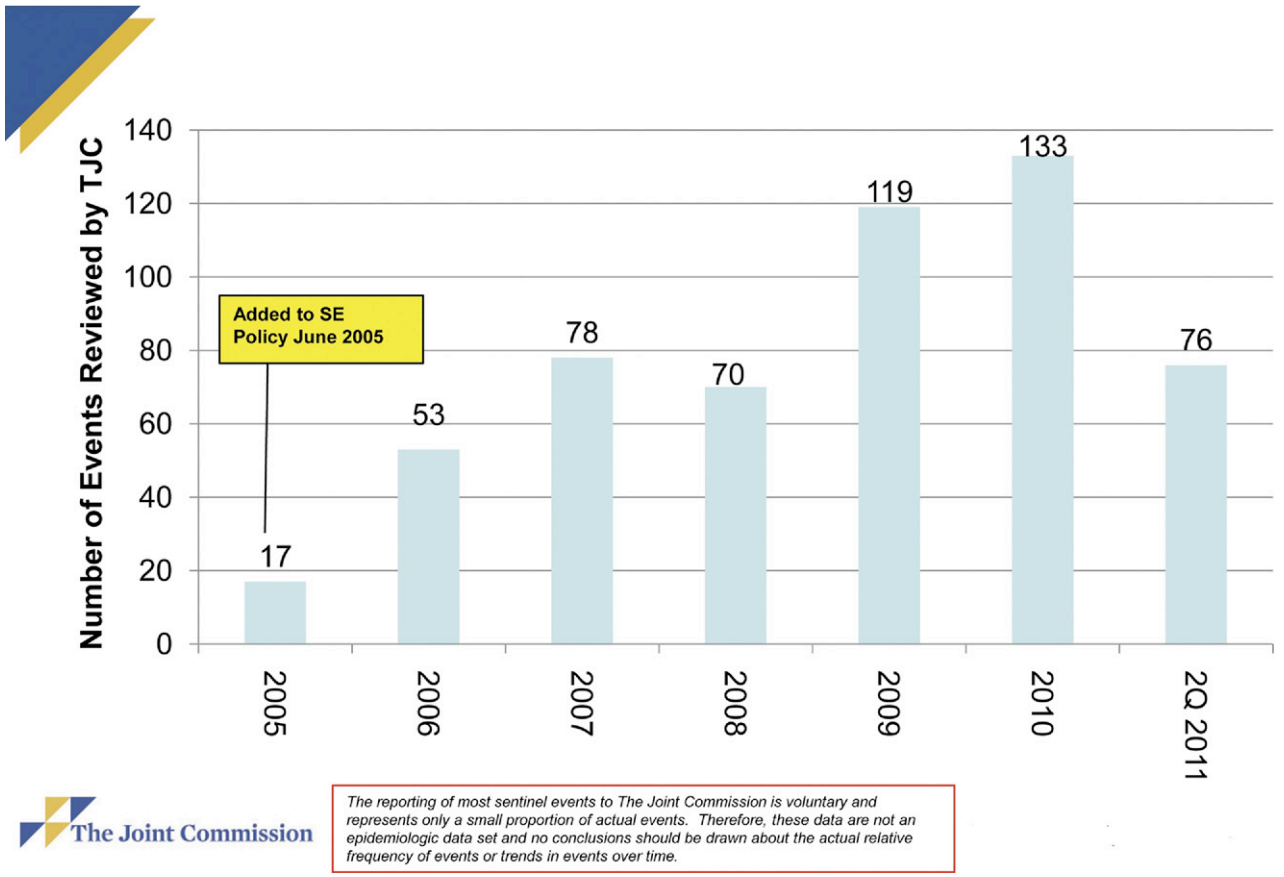

Figure 2. Unintended retention of foreign object events reviewed by The Joint Commission (resulting in death or permanent loss of function). © The Joint Commission, 2011. *Reprinted with permission.*

Gawande et al[6] found that the risk of an RSI significantly increases in emergency surgery, when there are unexpected changes in the surgical procedure, in patients who have a higher body mass index, and when there is a breakdown in communication. Lincourt et al[7] noted an association between RSIs and multiple major surgical procedures performed simultaneously on a patient and an incorrect instrument or sponge count.

Camp et al[8] examined the risk factors and outcomes associated with RSIs during surgery in children based on the Agency for Healthcare Research and Quality Pediatric Quality Indicators, which are designed to evaluate the quality and safety of pediatric care. The researchers conducted a case-control study that analyzed the Pediatric Quality Indicators database and reviewed 413 incidents of unintentional RSIs after 1,946,831 surgical procedures. The researchers concluded that the highest likelihood of RSIs unintentionally left behind after surgery occurred during gynecologic procedures. The study also showed that the RSIs were associated with a length of stay eight days longer than the norm and a $35,681 increase in total hospital charges compared with usual costs. However, mortality rates did not increase.[8]

Patients with an RSI (eg, instrument, sponge) can experience complications such as pain, infection, abscess, or intestinal obstruction.[9] Berger and Sanders[10] reported on data from a closed claims study (1985-2001) that patient deaths were rare events, but they did identify some common adverse outcomes related to RSIs:

- 59% of patients had readmission to the hospital or a prolonged length of stay,
- 69% had a second surgery to remove the retained object,
- 50% had sepsis or infection,
- 15% had a fistula or small bowel obstruction, and
- 7% had a visceral perforation.

In another study, retained instruments were most commonly discovered around the 21st day after a surgical procedure, and only 6% were discovered within one day of the surgical procedure. Some RSIs were not discovered until several months or even years later.[6]

The actual incidence of RSIs is unclear; however, estimates range from one in every 1,000 to 1,500 abdominal procedures to one in every 8,000 to 18,000 inpatient procedures annually in the United States.[11] Surgical items are most commonly retained in the abdominal cavity and thorax, although no body cavity is exempt.[7] Mortality rates in the United States from unintended RSIs have been estimated to be as high as 35%.[12]

Cost and Legal Ramifications

The cost of RSIs can be significant, as they may lead to patient harm, increased hospital stays, and litigation. The surgical team is subject to malpractice lawsuits and actions from the National Practitioner Data Bank and state licensing board when surgical items are retained.[9] The National Practitioner Data Bank monitors the occurrence of medical malpractice and disciplines incompetent clinicians with the goal of improving health care quality.[9] The Centers for Medicare & Medicaid Services[13] has calculated a cost of approximately $166,135 for each undetected RSI, which includes legal defense, indemnity payments, and unreimbursed surgical costs.[1] In October 2008, the Centers for Medicare & Medicaid Services stopped reimbursing health care facilities for postoperative complications related to RSIs.[13]

Standardizing Practice to Prevent Count Discrepancies

The first line of defense in eliminating RSIs is a safe, thorough, and effective process of keeping track of sponges, instruments, needles, and other miscellaneous items used in surgery and preventing count discrepancies. Manual counting is dependent on human performance and environmental factors that may affect subsequent recounts, which increases the chance for human error. The literature suggests that the most frequent reason for RSIs is human error caused by breakdown in communication and faulty processes.[14] Research shows that communication breakdown, distractions, competing demands, production pressure, and lack of significant personnel are all factors that can lead to counting errors.[1] The OR culture also can affect how the tasks are performed. For example, teams that encounter conflict, communication breakdown, or barriers related to hierarchy may be more likely to follow incorrect or substandard counting practices.[1,14]

Inaccurate documentation of sponges and instruments, which could potentially contribute to an RSI, was associated with the majority of discrepancies in one 2008 study.[2] In this study, researchers used direct observation to prospectively evaluate and describe the rate and type of discrepancies that were encountered during the surgical count. Results showed that one in eight surgical procedures involved an intraoperative count discrepancy. These findings represent the limitations of manual surgical counts and dictate that discrepancies should always prompt a thorough search and reconciliation process and should never be ignored.

Adhering to a standardized count policy and practice is one way to prevent the retention of a surgical item.[1] AORN, the ACS, and The Joint Commission promote and guide standardized count practices geared toward the prevention of RSIs. The ACS[14] has made several recommendations to prevent the retention of sponges,

sharps, instruments, and other designated miscellaneous items:

- maintain an optimal OR environment to allow focused performance of surgical tasks,
- consistently apply and adhere to standardized counting procedures,
- perform a methodical wound exploration before closure of the surgical site,
- use x-ray detectable items in surgical wounds, and
- employ x-ray or other technology (eg, radiofrequency [RF] detection, bar coding), as indicated, to ensure no unintended item remains in the surgical field.

The ACS recommends documenting the counted items and any intentionally retained items (eg, packing), notifying the surgical team of the count status, and documenting actions taken when a count discrepancy occurs. The ACS also states that these measures can be suspended as necessary for any life-threatening situations.[14] Surgical facilities must provide resources to support these safety measures. Policies and procedures for the prevention of RSIs should be developed, reviewed, and revised regularly.[15]

AORN, the ACS, and The Joint Commission all have provided guidelines for the prevention of RSIs that were designed to accommodate various nursing practice settings. In most perioperative settings, counting procedures are in place to help prevent unintended RSIs and subsequent complications.[9] However, regulations do not dictate how counts are to be performed. Most institutions develop their own policies and procedures based on the recommended practice guidelines from AORN and the ACS.[15,16]

Assistive Technology

The use of adjunct technology that aids teams in the detection of a retained or missing sponge is gaining momentum, and the literature suggests implementing multiple methods of prevention.[1,2,17,18] Strategies to consider include radiograph screening, multidisciplinary approaches, and the use of assistive technology.

Routine postoperative screening radiographs have been conducted at some hospitals. Gawande et al[6] recommended radiography at the end of emergent surgeries, surgeries in which an unexpected change in the procedure took place, and surgeries on a patient with a high body mass index. However, few studies have evaluated the effectiveness of intraoperative and postoperative radiographs.[1] In one large study, 33% of RSIs were not detected on radiograph.[11] The calculated cost and the additional exposure to radiography also must be considered. Incorrect counts add time to procedures, radiation exposure to patients, and the possibility of suboptimal film or failure to locate the retained item.

Several studies of counts innovations have indicated a high rate of accuracy that surpasses the accuracy of a traditional surgical count.[2,19,20] Two types of adjunct technologies are currently available: bar code and RF systems. Both systems are intended for use in addition to manual counting and are not intended to replace it. Neither of these systems currently can detect a retained instrument or needle; however, surgical sponges are the most commonly retained items.[6] Use of technology can facilitate recognition of a count discrepancy or detect a missing sponge, augmenting the counting process even when the final count is considered correct. In fact, Gawande et al[6] showed that 88% of RSIs were associated with a count that was thought to be correct. Assistive technologies have the potential to reduce hospital litigation expenses, unreimbursed surgery, surgical delays, and exposure, as well as costs associated with using radiation.[20] It is prudent for institutions to evaluate and consider implementing one of these technologies to aid in the prevention of retained surgical sponges.

Bar coding sponges tracks them by requiring each sponge to be scanned onto the sterile field and scanned back off of the sterile field. Sponges must be scanned one at a time and cannot be

detected in bulk. In a randomized, controlled study, Greenberg et al[2] discovered that bar coding detected significantly more counting discrepancies than traditional manual counting protocols. These discrepancies involved both misplaced sponges and miscounted sponges. The researchers also found that the system introduced new technical difficulties and increased the time spent counting. Bar coding improved the team's ability to recognize count discrepancies but did not change the amount of time required to resolve the discrepancy or decrease the likelihood of requiring a radiograph to resolve the discrepancy. In the event of an incorrect sponge count, a radiographic image will most likely be taken to rule out a retained sponge. By the end of the study, providers found the system to be easy to use, were confident in its ability to track sponges and detect miscounted or misplaced sponges, and reported having positive feelings about the counting process. Study results suggest that using bar-coded sponges has the potential to decrease the risk of retained sponges.

Radio-frequency technology utilizes a tiny microchip that is sewn into a gauze sponge and a handheld wand that is connected to a self-calibrating console. This technology is intended to be used at the end of a surgical procedure to validate count status, detect whether a sponge is retained in a patient, or help rectify an incorrect count by detecting a missing sponge. In one blinded, prospective, experimental trial, Macario et al[19] tested an RF wand device on eight patients who were undergoing abdominal or pelvic surgery. Even though the sample size was small, they concluded that the RF wand device was 100% accurate, and sponges were detected within one minute. The researchers noted that despite the engineering success, the possibility of human error and retained surgical sponges still exists because scanning could be performed incorrectly, such as by the user holding the scanning device too far away from the patient or not scanning the patient's entire body surface area. In addition, the researchers gave a questionnaire to the surgeons and nurses who were involved in the study; on a scale of 0% to 100%, they rated the system between 85% and 93% for ease of use and 78% to 94% for contributing to patient safety. A prospective crossover study by Steelman[18] determined 100% sensitivity and specificity of RF technology for identification of retained surgical sponges in a broad range of participants. The participants enrolled in the study had surgical sponges sequentially placed behind their torsos in the abdominal region, and of the 210 participants, nearly half were morbidly obese. The researcher concluded that this level of accuracy attained with RF technology far outweighs manual counting or intraoperative radiography and is therefore an appropriate tool to improve patient safety and prevent retained sponges.[18]

Radio-frequency technology is available to support manual sponge counting, has been proven highly accurate, and is cost effective. Children's Hospital Boston has invested in RF technology because it will not only detect a sponge in a patient when counts are incorrect but, more importantly, will detect a sponge when counts are considered correct and human error has occurred. Count discrepancies occur regularly, and valuable OR time can be spent searching for a missing sponge; if it remains unresolved, the patient is exposed to radiation. The RF wand facilitates finding missing sponges and can improve efficiency and staff member satisfaction, decrease expensive OR time, prevent patient exposure to radiation, and avoid the cost of radiography. It should be used in addition to manual counting, even when counts are considered correct. Although the technology is easy to use, users must be trained to use the RF wand correctly so that retained sponges can truly become "never events."

QI INITIATIVE

In the spring of 2009, the OR director at Children's Hospital Boston organized a perioperative nursing leadership retreat during which leadership

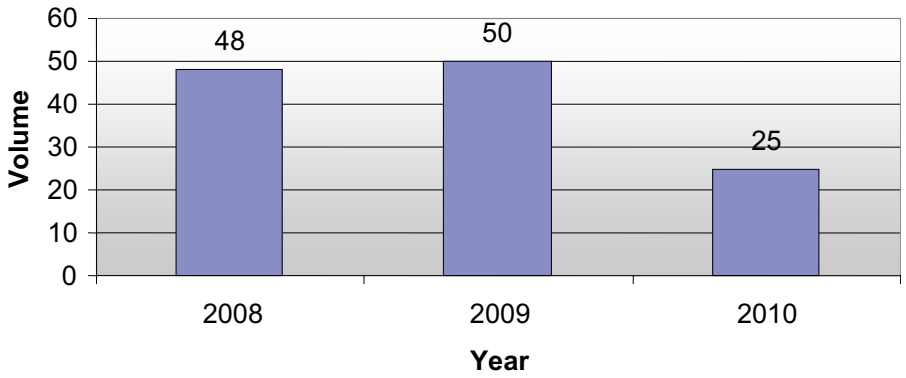

Figure 3. Main OR Children's Hospital Boston reported count discrepancies from 2008 to 2010. ***Note: Excludes satellite ORs and cardiac surgical services, which maintain separate data and have separate dedicated nursing staffs.***

group members were asked to identify perioperative nursing metric priorities that directly related to improved patient care and outcomes in the perioperative programs. Staff members agreed that a QI initiative to reduce the number of incorrect counts and count discrepancies and prevent RSIs was a top priority.

The OR risk manager made perioperative nursing staff members aware of the new initiative to reduce incorrect counts through staff meetings and e-mails. Enthusiastic verbal and written feedback received from nursing staff members supported this endeavor, and this enthusiasm ultimately contributed to the success of the initiative. Recognizing the importance of this initiative, a small task force developed a systematic strategy that included

- reviewing reported incorrect counts and count discrepancies,
- collaborating with the radiology department,
- reviewing and revising the existing count policy,
- standardizing practice,
- using a team approach to the count process, and
- conducting observational audits.

The goal was to reduce the number of reported incorrect counts and count discrepancies and thus reduce patient exposure to radiographs, decrease OR time and expense, and lower the risk of unintentional RSIs.

These strategies contributed to the reduction of count discrepancies in the main OR by 50% between 2009 and 2010 (Figure 3). Additionally, there was an estimated OR cost savings of $12,500 associated with a decreased need for intraoperative radiographs taken for unresolved counts (Figure 4). In 2009, there was one count discrepancy for every 367 surgeries, with no items identified on radiograph. In 2010, there was one count discrepancy for every 697 surgeries and one item, an instrument, found on radiograph and removed in the OR before wound closure (Figure 5). Quality improvement strategies were developed and refined throughout the year in 2010. Implementation of standardized count practices in the surgical suite has been at the center of these changes.

Review of Reported Incorrect Counts and Count Discrepancies

The electronic safety event reporting system that we use at Children's Hospital Boston gathers data on any adverse or near-miss events. Trends in incorrect counts led the OR risk manager to analyze the data.

In 2010, the OR risk manager developed and implemented a root cause analysis (RCA) tool to gather information on incorrect counts. The OR risk

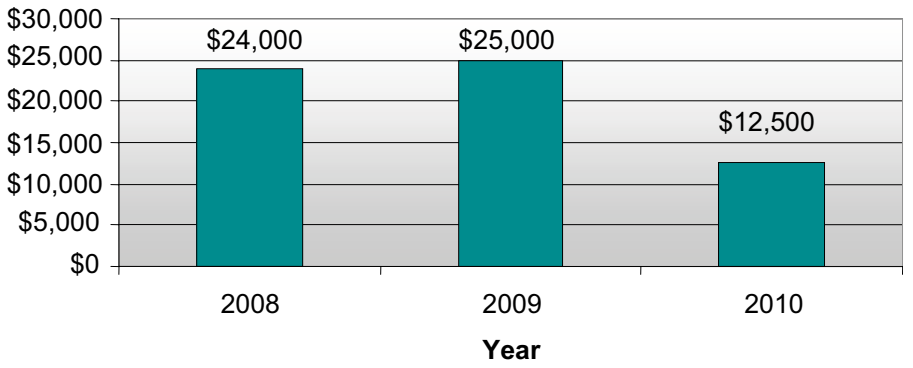

Figure 4. Main OR Children's Hospital Boston radiology cost associated with count discrepancies from 2008 to 2010.

manager followed up with the perioperative nursing team on all procedures in which an incorrect count occurred. The OR staff manager reviewed a summary of the findings with the perioperative staff members who were involved and reinforced the counts policy and practices as needed.

The RCA indicated that the majority of incorrect counts involved needles. The RCA also revealed the following trends that contributed to incorrect counts:

- surgical procedures that lasted longer than eight hours,
- multiple staff turnovers during a procedure,
- documentation discrepancies or omissions of items added to the surgical field,
- communication breakdown, and
- a lack of standardized practice due to variability and interpretation of count policy.

The OR risk manager presented the overall findings from the RCA during several staff meetings, and these findings were recorded in the meeting minutes. In addition, recommendations were made to improve the process of how procedures are assigned by limiting or reducing staff turnover during procedures.

Collaboration With the Radiology Department

Incorrect counts add time to procedures, result in radiation exposure to patients, and present the possibility of suboptimal film or failure to locate the retained item. Children's Hospital

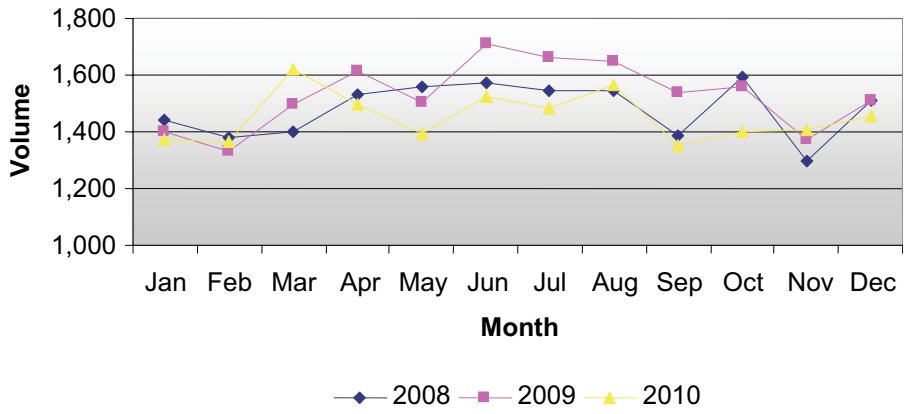

Figure 5. Main OR Children's Hospital Boston procedure volume associated with count discrepancy from 2008 to 2010.

Boston follows AORN guidelines in the event of a count discrepancy, which include conducting a thorough examination of the surgical site and field as well as a thorough search of the OR.[15] In the event of an unresolved, incorrect count, an x-ray is taken in the OR before wound closure and is read simultaneously by the surgeon and radiologist**.** The radiologist documents the final report in the patient record.

As part of the incorrect count follow-up, the OR risk manager reviewed the final radiology reports for accuracy. She found that the "reason for the film" was frequently omitted or incorrectly stated on the requisition. Therefore, when staff radiologists reviewed the final film, they were not always aware of the actual item deemed missing. This concern led to collaboration with the radiologist-in-chief and the lead OR radiology technologist to improve processes related to incorrect counts. The OR radiology technologist and the perioperative nursing staff members were educated to accurately record the "reason for the film" on the requisition (eg, missing snap, missing 4 × 4 sponge), thereby helping to ensure that the final read would rule out the indicated missing item. In addition, the lead OR radiology technologist trained his colleagues to collaborate with the surgeon and ensure that the radiological view of the surgical site(s) was adequate.

As part of the QI initiative, the OR risk manager worked with the lead OR radiology technologist to label and radiograph commonly counted items to demonstrate how the items appear on film, which would further enhance the accuracy of radiograph interpretation. These films are now available in the radiology computer system, and the images can be accessed by the surgeon or radiologist to review as needed.

Review and Revision of the Count Policy

The hospital's count policy was reviewed and revised in July 2010 and again in January 2011 based on 2010 AORN recommendations[15] and current literature, with input from the hospital's OR practice committee members.[21] Operating room managers, the OR nursing director, and the OR governance committee members evaluated and approved policy updates and recommendations. After the policy updates were approved, perioperative nurses reviewed these revisions and updates through staff meetings, electronic education, and e-mail alerts. Key policy updates included

- defining team roles and responsibilities,
- requiring methodical wound exploration,
- accounting for surgical items in their entirety as they are passed back from the surgical field, and
- promoting active communication.

Standardized Count Practices

The audit findings revealed a need to standardize the count process. After it was determined that nurses were documenting counts in various ways, a dry erase board was provided in each OR to standardize counts. Count practice expectations and updates were reinforced during several educational inservice programs and staff meetings and through electronic communication. The nurse managers enforced the established protocol of having two nursing team members count audibly and visibly. Education included the sequence of counting from the surgical field back to the Mayo stand, to the back table, and then to the sponge receptacle.

Nurses in surgical specialties worked together to streamline instrument kits in an effort to improve the instrument count process and remove obsolete and redundant items. The nurses also updated the instrument count sheets to facilitate a smooth flow during counting. In addition, the instrument count sheet and the string of instruments were arranged in the same order for ease of counting. The updated count

sheets list a total for each grouping of instruments. For example, all the scissors are listed individually but the total number of scissors also is listed to improve efficiency.

Team Approach

In 2011, Children's Hospital Boston adopted a team approach to the count process based on recommendations from AORN, the ACS, and Verna C. Gibbs, MD, a nationally recognized leader in the prevention of RSIs. Implementing a systematic multidisciplinary team approach supported by a policy that meets recommended practices and the needs of the institution seems to be a logical way to reduce the number of RSIs and count discrepancies. In her 2010 presentation "NoThing Left Behind®,"[17] Dr Gibbs recommended that surgeons take an active role and "pause for the gauze." This includes performing a methodical wound exploration in every procedure, actively looking for sponges, and announcing that sponges are removed. Dr Gibbs recommends a visible and transparent system that includes using pocketed sponge holders and dry erase boards for all team members to see. Use of a pocketed sponge holder is an inexpensive solution—they cost about 30 cents each—to improve final accounting for all sponges. The sponges are placed in individual clear plastic pouches in quantities of 10 per holder. All sponges must be in the holder at the end of each procedure for the whole team to visualize and verify during the final count. This system provides the surgeon and nurse with proof that all the sponges have been removed.

Before wound closure, perioperative team members conduct a "wound closure time out" (Figure 6). This new process, which involves the whole surgical team, begins before wound closure with a member of the nursing team announcing, "wound closure time out." During this process, the team members are expected to avoid interruptions or distractions. Relief of staff members during the count process is prohibited. The surgeon is responsible for exploring the wound for any unintentionally retained items. The nursing team then completes the closing count by audibly and visibly conducting surgical counts. The nursing team is responsible for announcing the closing count status to the team. This process is embedded into the institution's pediatric surgical safety checklist in the "sign out" segment. After the wound closure time out is accomplished, the team can proceed to conduct the remainder of the sign out or can complete the sign out after closure.[22] The surgeon-in-chief presented this new process during mandatory multidisciplinary grand rounds.

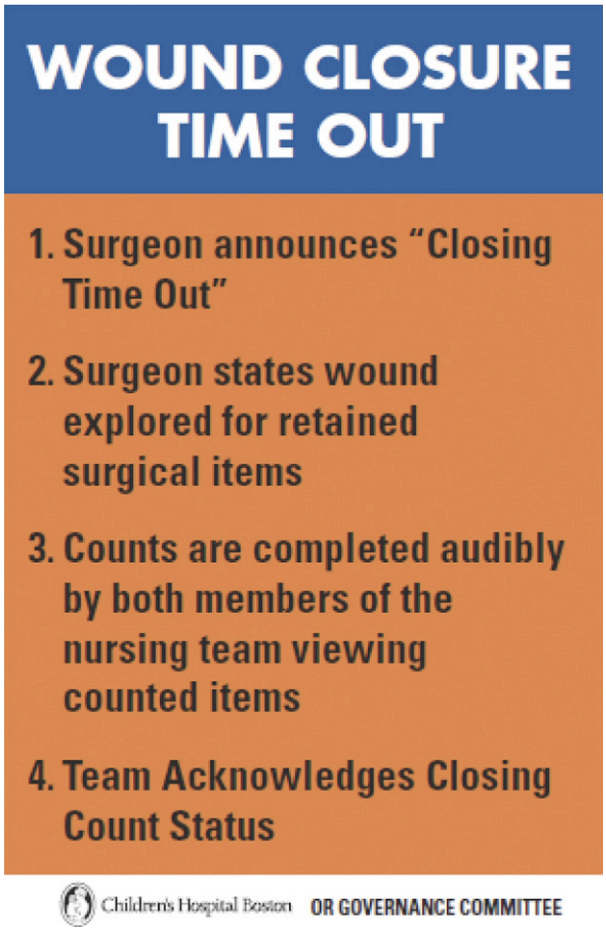

Figure 6. The wound closure time out is embedded in the Pediatric Surgical Safety Checklist at Children's Hospital Boston in the "sign out" segment. ***Reprinted with permission.***

We implemented the use of RF technology and the pocketed sponge holder system in September 2011. Dedicated dry erase boards for counting allow the whole team to view counts and have replaced paper count worksheets. A final count verification process includes the team's visualization and confirmation that all sponges are contained in the holder and therefore not retained in the patient. Other new initiatives for 2011 aimed at further improving the OR culture and safety to prevent RSIs include

- auditing the wound closure time-out process,
- encouraging participation and accountability from the entire surgical team,
- reducing staff turnover during procedures,
- reducing or eliminating staff turnover during critical parts of procedures, and
- discouraging interruptions after the counting procedure is initiated until it is finished.

All of the new initiatives for 2011 have been implemented. We are measuring compliance through auditing.

Observational Audits

The OR at Children's Hospital Boston has an active measurement committee that is devoted to improving compliance through the audit process. We developed a live audit tool to collect data on count practices. The OR audit committee members are responsible for monitoring compliance with the following:

- standardized count process;
- use of dry erase boards for visualization of count documentation for all procedures;
- the initial instrument count for all laparoscopic, thoracoscopic, and robotic procedures;
- the initial instrument count for abdominal, retroperitoneal, and thoracic cavity surgery;
- change over count during permanent relief;
- counting of miscellaneous and disposable items; and
- withholding of dressing sponges until after the final count.

The observational count audits began in 2010. Results identified some areas that were in need of improvement, including discrepancies in interpretation of standardized count practices (ie, the sequence of counting from the surgical field back to the sponge receptacle). The auditors discovered a wide variation in the type of worksheets used to tally intraoperative counts (eg, whiteboard, count sheet, sheet of unmarked paper). These disparities contributed to incorrect counts and count discrepancies associated with documentation errors. Auditors also noted that staff members did not consistently include disposable instruments in the count. On the positive side, the auditors observed minimal distractions such as conversations, loud music, beepers, and telephone calls during the count process, and compliance with counting instruments was 100%. Audit results are shared with the nursing staff members, and when thresholds are met, the audit tool is revised. The measurement committee continues to observe various aspects of count practices.

AORN Resources

- AORN Video Library: Preventing Retained Surgical Items (Ciné-Med, 2011). *http://cine-med.com/index.php?nav=aorn.*
- Clinical Answers: Counts/Retained Surgical Items. *http://www.aorn.org/Clinical_Practice/Clinical_Answers/Clinical_Answers.aspx.*
- Confidence-Based Learning module: Prevention of retained surgical items. *http://www.aorn.org/Education/Curriculum/Confidence_Based_Learning/Retained_Surgical_Items.aspx.*

Web site access verified December 13, 2011.

CONCLUSION

The goal of this QI project was to reduce the number of incorrect counts and count discrepancies and to prevent RSIs. Standardized count practice, policy updates, staff education, and enhanced collaboration with physician colleagues led to a 50% reduction in reported incorrect counts in 2010. Staff members at Children's Hospital Boston are committed to this ongoing and evolving QI process. These initiatives, with the adoption of adjunct technology, will optimize the goal of preventing RSIs. Retained surgical items are preventable "never events," and perioperative nurses play a vital role in ensuring that "never" becomes reality. AORN

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Editor's note: *NoThing Left Behind is a registered trademark of Verna C. Gibbs, San Francisco, CA.*

References

1. Pennsylvania Patient Safety Authority. Beyond the count: preventing retention of foreign objects. *Pa Patient Saf Advis*. 2009;6(2):39-45. http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2009/Jun6(2)/Pages/39.aspx. Accessed September 16, 2011.
2. Greenberg CC, Regenbogen SE, Lipsitz SR, Diaz-Flores R, Gawande AA. The frequency and significance of discrepancies in the surgical count. *Ann Surg*. 2008;248(2):337-341.
3. Sentinel event. The Joint Commission. http://www.jointcommission.org/sentinel_event.aspx. Accessed September 16, 2011.
4. *Sentinel Event Data Event Type by Year, 1995-Second Quarter 2011*. Oakbrook Terrace, IL: The Joint Commission; 2011. http://www.jointcommission.org/assets/1/18/Event_Type_by_Year_1995-2Q2011(v).pdf. Accessed October 6, 2011.
5. Rowlands A, Steeves R. Incorrect surgical counts: a qualitative analysis. *AORN J*. 2010;92(4):410-419.
6. Gawande AA, Studdert DM, Orav EJ, Brennan TA, Zinner MJ. Risk factors for retained instruments and sponges after surgery. *N Engl J Med*. 2003;348(3):229-235.
7. Lincourt AE, Harrell A, Cristiano J, Sechrist C, Kercher K, Heniford BT. Retained foreign bodies after surgery. *J Surg Res*. 2007;138(2):170-174.
8. Camp M, Chang DC, Zhang Y, Chrouser K, Colombani PM, Abdullah F. Risk factors and outcomes for foreign body left during a procedure: analysis of 413 incidents after 1 946 831 operations in children. *Arch Surg*. 2010;145(11):1085-1090.
9. Jackson S, Brady S. Counting difficulties: retained instruments, sponges, and needles. *AORN J*. 2008;87(2):315-321.
10. Berger PS, Sanders G. Objects retained during surgery: human diligence meets systems solutions. *Patient Safety & Quality Healthcare*. 2008;5(5). http://www.psqh.com/sepoct08/objects.html. Accessed September 16, 2011.
11. Cima RR, Kollengode A, Garnatz J, Storsveen A, Weisbrod C, Deschamps C. Incidence and characteristics of potential and actual retained foreign object events in surgical patients. *J Am Coll Surg*. 2008;207(1):80-87.
12. Patient safety update: retained foreign objects. August 2010. Massachusetts Department of Public Health. http://www.mass.gov/Eeohhs2/docs/borim/physicians/retain_foreign_objects_advisory.pdf. Accessed September 16, 2011.
13. Hospital-acquired conditions (present on admission indicator). Centers for Medicare & Medicaid Services. http://www.cms.gov/HospitalAcqCond. Accessed September 16, 2011.
14. Gibbs VC, McGrath MH, Russell TR. The prevention of retained foreign bodies after surgery. *Bull Am Coll Surg*. 2005;90(10):12-14, 56.
15. Recommended practices for prevention of retained surgical items. In: *Perioperative Standards and Recommended Practices*. Denver, CO: AORN, Inc; 2011:263-282.
16. [ST-51] Statement on the prevention of retained foreign bodies after surgery. Chicago, IL: American College of Surgeons; 2005. http://www.facs.org/fellows_info/statements/st-51.html. Accessed October 6, 2011.
17. Gibbs VC. NoThing left behind®: A National Surgical Patient-Safety Project to prevent retained surgical items. Talk presented at: Children's Hospital Corporation of America; 2010; Kansas City, MO.
18. Steelman VM. Sensitivity of detection of radiofrequency surgical sponges: a prospective, cross-over study. *Am J Surg*. 2011;201(2):233-237.
19. Macario A, Morris D, Morris S. Initial clinical evaluation of a handheld device for detecting retained surgical gauze sponges using radiofrequency identification technology. *Arch Surg*. 2006;141(7):659-662.
20. DiConsigio J. Count on a backup. *Mater Manag Health Care*. 2008;17(11):18-21.
21. Norton EK, Micheli AJ, Gedney J, Felkerson T. A nursing led collaborative approach for the development and implementation of a count policy for the prevention of retained surgical items. *AORN J*. In press.
22. Norton EK, Rangel SJ. Implementing a pediatric surgical safety checklist in the OR and beyond. *AORN J*. 2010;92(1):61-71.

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