

THE PREVENTION OF RETAINED FOREIGN BODIES AFTER SURGERY

by Verna C. Gibbs, MD, FACS, San Francisco, CA;
Mary H. McGrath, MD, MPH, FACS, San Francisco, CA;
and Thomas R. Russell, MD, FACS, Chicago, IL

The American College of Surgeons recognizes that patient safety is an item of the highest priority. The College has a long-standing tradition of commitment to safe care for surgical patients, and it is now taking the lead in an effort to eliminate the occurrence of retained foreign bodies after surgery.

Since the practice of surgery began, surgical instruments, sponges, and needles have been left unintentionally in various body spaces after an operation. Recently there has been increased public interest in the unexpected discovery of surgical retractors, scissors, or clamps after various operations. However, although the cases of retained surgical instruments get the biggest headlines, the retention of surgical sponges probably occurs more frequently. Every hospital, surgeon, and perioperative care nurse in the U.S. has likely thought about, if not experienced firsthand, some aspect of this problem.

It has been estimated that one case of a retained item postsurgery occurs at least once a year in any hospital where 8,000 to 18,000 major procedures are performed annually (Gwande AA; see Statement bibliography, page 17). This estimate is based on claims data, but there likely have been uncounted cases settled outside the legal system. Moreover, there are likely even more

cases in which near misses—incorrect counts of instruments and sponges resolved with intraoperative searches or X rays—have occurred. These measures to rectify near misses consume valuable operating room personnel time and resources.

Reports in the surgical literature document sponges discovered by various radiographic techniques or as a result of the patient presenting with gastrointestinal fistulas or cutaneous wounds. Once a sponge is identified, it must be removed, necessitating informed discussion with the patient, followed by additional surgery.

The working environment

An operation or invasive procedure is performed by a group or team of interdependent health care providers—including anesthesiologists, surgeons, nurses, and surgical technicians—working toward a common goal with a system committed to safe, efficient, and effective functionality. In the operating room (OR), a busy

workplace, this intensely interactive group or team of professionals performs exacting tasks under considerable time pressure, which is highly complex and internally dynamic work. This work environment mandates durable and systematically applied processes of care. These safety practices must be robust enough to protect patients under the most chaotic of circumstances yet be simple enough to be applied and understood by all health care professionals, from the novice to the master. All participants working in the OR have a common ethical, legal, and moral responsibility to do whatever possible to ensure an optimal patient outcome.

There is no experimental evidence that directly addresses the root causes of retained foreign bodies, but anecdotal and experiential evidence (including quality improvement reviews, risk-management reports, and closed claims studies) suggests that these events occur because of poor communication between perioperative care personnel and faulty processes of care in the OR. Examples of poor communication include surgeons dismissing reports of a miscount as erroneous, multiple intraoperative personnel changes without accurate cross-informational reporting, and mixed messages between team members about the timing for the emergence from anesthesia if an intraoperative X ray to detect a missing item is needed. Faulty processes of care include inadequate or incomplete wound explorations; poorly performed sponge and instrument counts; and incomplete, inadequate, or misread intraoperative X rays.

Communication in the operating room

Issues of communication are especially relevant to the problem of retained foreign bodies because misunderstandings and conflict may be the result of many contributing factors—for example, cross-cultural (nurse–surgeon), gender-related (male–female), hierarchical (captain–crew: surgeon–OR team), and structural (medical staff–hospital staff). There can also be a wide divide between the levels of training and experience among the different people working together as OR staff, and their styles of communication may be quite different.

However, such differences are manageable. The airline industry provides a good model for deal-

ing with communication among persons with a broad range of backgrounds, as pilots, navigators, cabin attendants, maintenance crews, air-traffic controllers, baggage handlers, and others must communicate effectively to ensure safe operations. The airline industry has addressed this need by developing team communication and performance standards, training to these standards, reviewing performance, and enforcing these standards equally across the playing field. Developing guidelines and providing training could similarly enhance communication and behavior among perioperative care professionals as a way of improving surgical instrument and sponge management in the OR.

Processes of care in the OR

The manual counting of sponges, sharps, and instruments is a widely applied OR practice. Although there is no solid published evidence for the effectiveness of this practice, it is the only modality currently used for tracking surgical tools. Assistive devices—such as the widely used hanging pocket plastic counting device for sponges, needle counter boxes, and wall-mounted boards or screens for recording the number of items—have proven useful.

Process review and improvement should be implemented regularly, but they should be routine after any near miss or retained foreign body event. A focused review or contributing factors analysis often identifies areas within established processes of care in need of revision.

In addition to manual counting, other safety measures help account for surgical tools and objects. Sponges, towels, gauze, and cotton pads placed in the operative field should contain a radio-opaque marker and only an X ray-detectable item should be placed in the surgical wound. Anesthesiologists often use gauze sponges that are non-radio-opaque in their work area, for example, and they should be alert about keeping unmarked items away from the operative field and disposing of them in containers separate from those used to track X ray-detectable sponges. Surgeons should execute a methodical exploration of the operative site before the closure of the wound; this is especially important in the chest, abdomen, and pelvis, as these three large body cavities are the most common sites in which surgical items are lost (Gibbs VC: see

Statement bibliography, page 16). This exploration should be performed before the final sponge and needle count—and it should be performed during every operation. In the event of an incorrect count, the wound should be reopened as necessary and reexplored.

The introduction of a requisite “time out” at the start of surgery is an opportunity for everyone on the OR team to exchange and confirm information. During the case, maintenance of an optimal OR environment will allow all participants to mindfully accomplish their work. It is helpful if distractions, interruptions, noise, conversation, and traffic are limited. When personnel changes occur during a procedure, there must be mechanisms for the complete and accurate transmission of relevant information about the surgical field and its contents. Nearing the end of surgery, the final count of surgical sponges, needles, and instruments requires visual and audible confirmation between two perioperative care staff and the conveyance of this information to the surgeon. Setting aside time for focused performance of this operative task will enhance accuracy and reduce errors.

Institutional support and guidelines

Surgical facilities must provide the resources necessary to ensure equipment and personnel, such as X ray or other equipment, are available to support perioperative surgical safety measures as needed to check for an unintended item in the operative field. When a confirmation X ray is requested, hospital technicians should be accessible and expeditiously dispatched; expert radiological review of the films should also be available.

Such resources are especially important in trauma settings or when the patient is in a critical, life-threatening situation in the OR. In these situations, usual counting procedures might be suspended and replaced with a mandatory radiological evaluation in an alternative care setting once the patient has been stabilized.

To create a safer OR, institutional policies must be developed and rules established. Documented compliance with policies and procedures should be simple—easy to access and easy to understand—and it should be monitored for accuracy and completeness. Deviation from standards should be detectable and addressed

promptly. Furthermore, these policies must apply to and be followed by all perioperative care personnel.

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Dr. Gibbs is professor of surgery and chair, department of surgery QI committee, University of California, San Francisco, CA.



Dr. McGrath is professor of surgery, division of plastic surgery, University of California, San Francisco, and a Regent of the College.



Dr. Russell is the ACS Executive Director, Chicago, IL.



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The future

Eventually, technological advances in instrument and sponge detection, such as scanners or handheld detectors, may make it easy to account for surgical tools without cumbersome counting procedures. The task of improving patient safety is an exceptional platform for emerging new technologies. There are many companies in various stages of development with innovations to make the surgeon's job safer. The incorporation of new technology that can facilitate accounting of surgical tools (such as bar-coding instruments or detection systems for sponges including radio-frequency identification and electronic surveillance systems) should be

evaluated and considered for adoption as they become available.

Summary

The goal of this surgical patient initiative is to bring the incidence of retained foreign bodies after surgery to zero. The College encourages every Fellow to adopt the recommendations provided in the ACS Statement on the Prevention of Retained Foreign Bodies after Surgery (see page 15) and to move forward to refine policies and processes of care. With effective perioperative care systems, the surgical patient can be assured that there will be "NoThing Left Behind." [Q](#)