

Literature matters research bulletin

The Hidden Costs of Reconciling Surgical Sponge Counts

Victoria M. Steelman, PhD, RN, CNOR, FAAN; Ann G. Schaapveld, BSN, RN; Yelena Perkhounkova, PhD; Hillary E. Storm, MSN, RN, CNOR; Michelle Mathias, BSN, RN
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Introduction:

Retained surgical items (RSIs), which include sponges, needles, and instruments, have been one of the most frequent sentinel events reported to The Joint Commission for the last 10 years¹ and are estimated to occur in one in 5,500 surgeries². These serious adverse events have resulted in negative patient outcomes, including reoperation,^{3,4} readmission or prolonged hospital stay,^{3,4} infection or sepsis³, fistulas or bowel obstructions,³ visceral perforation,³ and death³. Cotton gauze sponges account for 52% to 69% of RSIs^{2,4} and result in more serious tissue reaction than metal items.

The purpose of this descriptive study was to estimate the cost of nonproductive OR time (*ie, time spent not moving forward with the surgical procedure*) required to reconcile surgical sponge counts and the time and costs of using radiography to rule out retained surgical sponges.

This information is needed by perioperative nurses when evaluating the cost-effectiveness of purchasing alternatives (*eg, adjunct technology*) to supplement the surgical sponge count.

Literature review:

The current AORN "Guideline for prevention of retained surgical items"⁵ recommends manual counting, an ongoing process requiring the attention of OR personnel throughout the procedure.

The reliance on the surgical count for patient safety is problematic. Researchers found that 62% of RSIs were detected by postoperative radiography after the surgical count was reported as being correct.² Count discrepancies are common. In a prospective observational study, researchers found count discrepancies in 12.8% of elective surgery cases.⁶

In a large study comparing radiographs performed intraoperatively versus postoperatively, intraoperatively imaging failed to detect 33% of retained items.² This is important in today's health care reimbursement model with payment fixed by diagnosis-related group, reducing that procedure's contribution margin and overall profitability.

The AORN guideline for prevention of RSIs recommends that "Perioperative personnel should evaluate existing and emerging adjunct technology to determine the application that may be most suitable in their setting."⁵

A computer-assisted counting system using two-dimensional data matrix-labeled (*ie, bar-coded*) sponges and a scanner are available to assist with the reconciliation of the surgical sponge count. Studies have shown that this technology significantly increases the identification of misplaced and miscounted sponges.^{7,8}

Results:

Overall, the authors reviewed records for 13,322 patient surgeries (*Table 1*).

The most frequent surgical services involved were orthopedics (23.1%), general surgery (19.7%), and neurosurgery (14.6%). Perioperative personnel required additional time and effort to reconcile 212 surgical sponge counts. Of these 143 occurred during the first closing counts and 63 occurred during final closing counts.

During this nine-month study, the cost of obtaining and reading these radiographs (based on the published average cost per radiograph of \$286)⁹ was \$14,872. The cost of OR time to obtain the radiographs (based on 30 minutes per radiograph)⁸ was \$96,720. The combined annualized costs of obtaining, reading and waiting for the results of the radiographs was \$148,789. The total annualized cost of searching for missing sponges and using radiography to rule out the presence of a retained sponge was \$219,056.

Discussion:

The Joint Commission requires investigation of RSIs after surgery, defining after surgery as "any time after completion of the skin closure; even if the patient is still in the OR under anesthesia."¹⁰ This definition provides an incentive for surgical teams to stop the progress of surgery while searching for a sponge, obtaining a radiograph for a missing sponge, and waiting for the radiograph to be read.

Key take-aways:

- Time spent searching for sponges draws the attention of personnel away from other high-priority tasks (*eg, blood administration, airway issues, technology safety issues*) and decreases the efficiency of completing the surgical procedure.
- The authors also estimated the cost of ruling out a retained sponge using radiography, including the cost of radiographs and OR time waiting for the results.
- These costs should be included in comprehensive cost analyses when considering alternatives to supplement manual counting.

Surgical Service	Number of procedures (% of all)			Duration of procedures (minutes)	
	n	Elective	Urgent	Emergent	Mean ± SD Median
Cardiothoracic	797	604 (75.8)	131 (16.4)	62 (7.8)	188.8 ± 140.4 156
General surgery adult/plastics	2,632	2,069 (78.6)	357 (13.6)	206 (7.8)	129.3 ± 101.6 102
General surgery pediatrics	619	455 (73.5)	139 (22.5)	25 (4.0)	62.8 ± 58.3 47
Gynecology	948	865 (91.2)	43 (4.5)	40 (4.2)	140.3 ± 90.3 136
Neurosurgery	1,950	1,305 (66.9)	366 (18.8)	279 (14.3)	134.6 ± 121.6 103
Orthopedics	3,079	2,474 (80.4)	555 (18.0)	50 (1.6)	121.8 ± 90.8 102
Otolaryngology	1,598	1,485 (92.9)	53 (3.3)	60 (3.8)	146.9 ± 153.1 101
Transplantation	211	100 (47.4)	91 (43.1)	20 (9.5)	229.2 ± 130.2 207
Vascular	575	444 (77.2)	62 (10.8)	69 (12)	162.7 ± 133.7 127
Urology	913	837 (91.7)	51 (5.6)	25 (2.7)	188.8 ± 140.4 156
All services	13,322	10,638 (79.9)	1,848 (13.9)	836 (6.3)	136.5 ± 118.1 105

SD = standard deviation.

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