The Hidden Costs of Reconciling the Surgical Sponge Count

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Disclosure

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Association of periOperative Registered Nurses (AORN): Guideline for Prevention of Retained Surgical Items (RSI)

- Surgical counts are performed to "account for all items used on the surgical field and to lessen the potential for injury to the patient as a result of a RSI."[1]
- Health care organizations are responsible for "employing practices to account for all surgical items used during a procedure including, but not limited to: complete and accurate counting, radiological confirmation, and the use of adjunct technology."[1]

Surgical Counts

- Performed by the circulating nurse & scrub person at the following surgical events:
  - Prior to the start of the procedure
  - When closing a cavity within a cavity (e.g. bladder)
  - When closing the first layer of tissue (e.g. fascia)
  - When closing the final layer (e.g. skin)[1]

Why Sponges?

- Cotton gauze sponges account for 52% to 69% of RSIs[2-4]
- Result in more serious tissue reaction than metal items
- Reliable adjunct technology available

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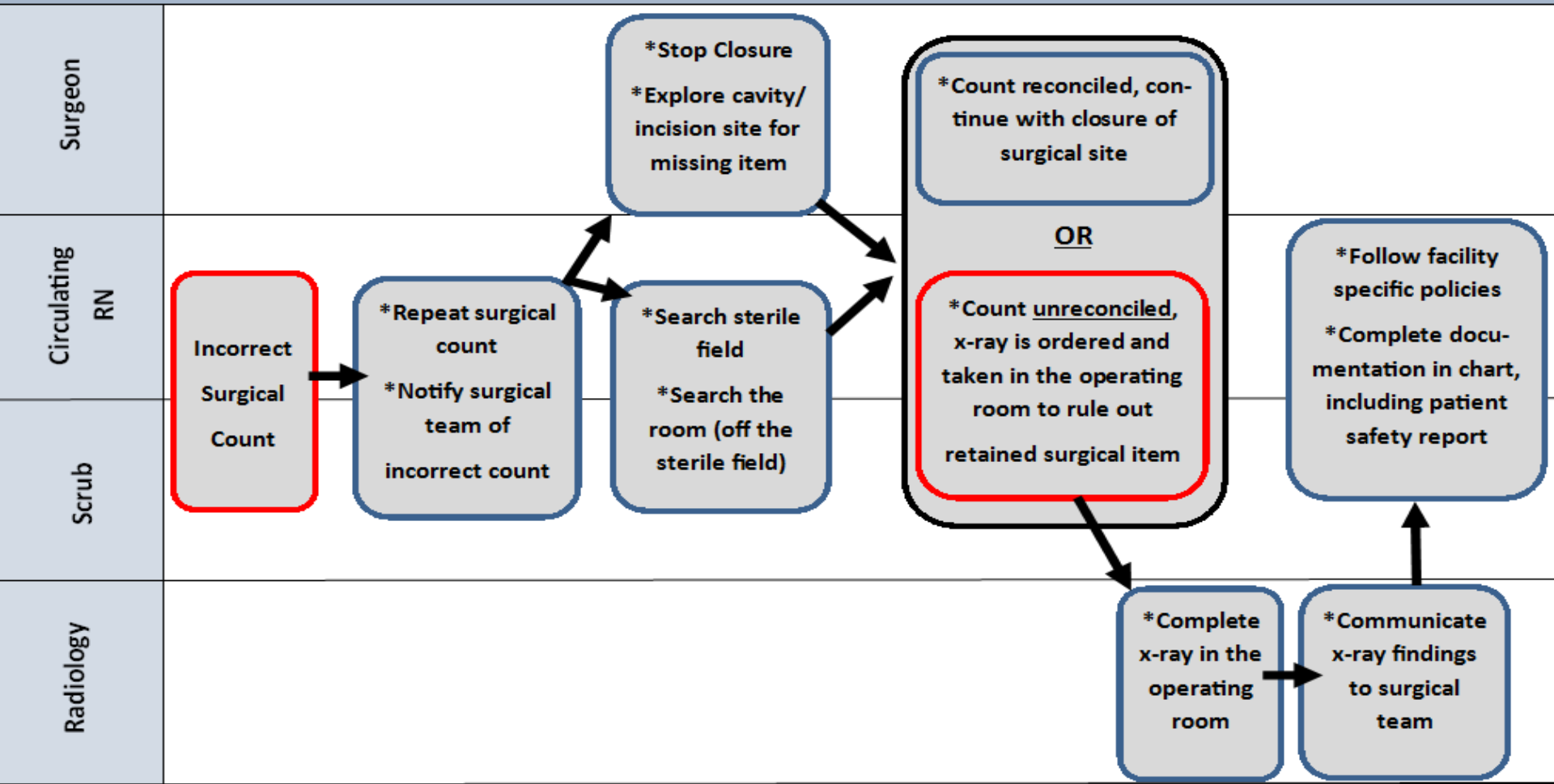
Operating Room: Incorrect Surgical Count



Counting too early

Sponges used during count

Not handing off sponges in packaged groups (5, 10)

Not counting a sponge

1 person counting – not 2

TIME PRESSURE

Recording too few sponges on count sheet

Part of sponge thought to be whole sponge

6 Phases of Sponge Management:

Not counting added sponges

Room Preparation

Sponge hidden under drapes

Sponge put someplace else during setup

Miscounting, counting sponge twice

Initial Count

Sponge dropped on floor

Placing too few sponges in a pocket

Adding sponges

Not recording added sponges on count sheet

DISTRACTION

Removing sponges

Not visualizing sponges

Not separating sponges

First closing count

Circulating RN unable to see from location

Dressings unwrapped during procedure

Final closing count

Placing too many sponges into a pocket

Handing off sponge with specimen

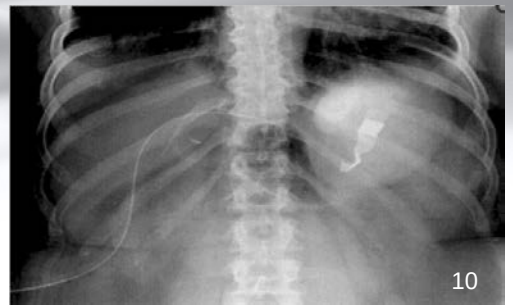
Scrub person counting

Not placing sponges into pockets

MULTITASKING

"The manual surgical sponge count does not adequately prevent retained sponges."[6]

Retained Surgical Items (RSIs)



- One of the most frequent reported sentinel events[7]
- Half of the malpractice settlements for surgical "never events"[8]
- 1 in every 5500 surgeries[2]
- Negative patient outcomes[3-4]
- Manual surgical counts = national standard for preventing RSIs[1]
  - Sensitivity - 77%[9]
- Intraoperative imaging failed to detect 33% of retained items[2]
- 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."[1]

Purpose

- Estimate the cost of nonproductive OR time reconciling surgical sponge counts
- Estimate the costs of using radiography to rule out the presence of retained sponges

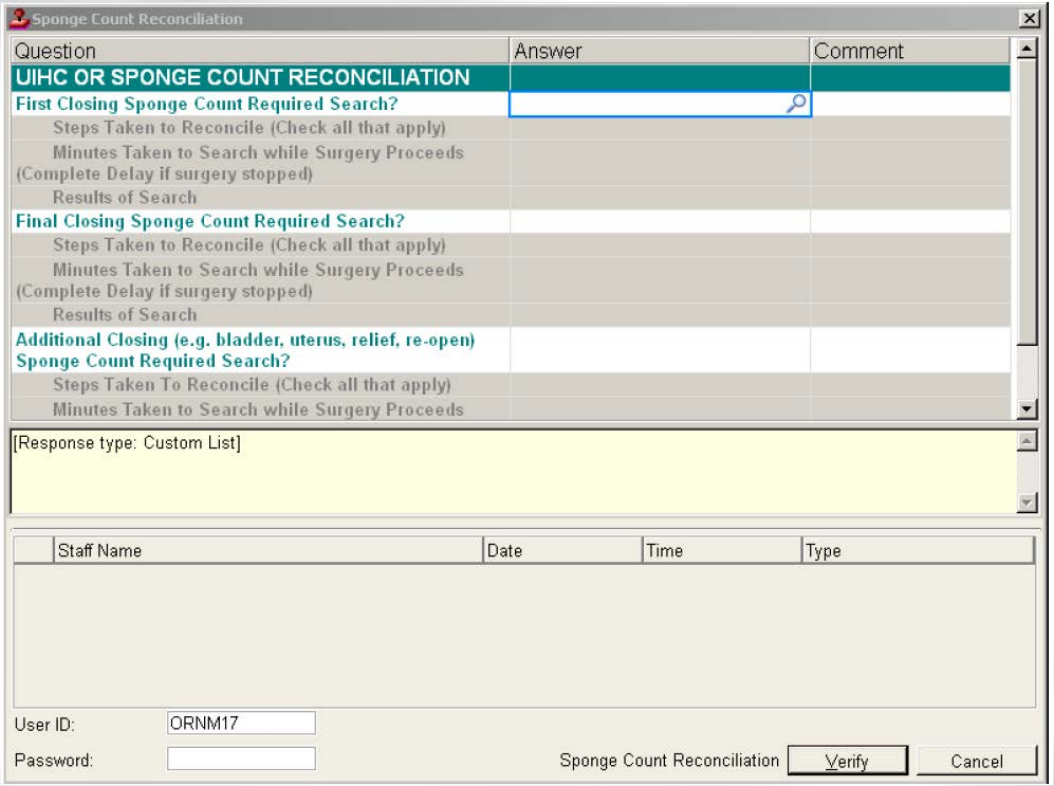
This information is needed for perioperative nurses to evaluate the cost-effectiveness of purchasing alternatives (e.g. adjunct technology) to supplement the surgical sponge count.

Methods

- Descriptive study
- Retrospective review
- Academic medical center – Level 1 trauma center
- Sample: All patients undergoing surgery in the Main OR from 2/14 through 10/14
  - Exceptions: ophthalmology, dentistry, nonsurgical procedures, aborted procedures, procedures when patient expired

Data Collection

- Recorded by circulating nurses
- EPIC® Optime® surgical log
  - "Hard stop"
- Incident reports



Results

- 13,322 patient surgeries
- Additional time & effort to reconcile 212 sponge counts
  - Services most often involved:
    - Neurosurgery (23.6%)
    - Orthopedics (21.2%)
    - General surgery adult/plastics (19.3%)

Location of Missing Sponges

- The missing sponge(s) were found in 186 (87.7%) of the 212 surgical sponge counts requiring reconciliation:

Location	Number (%)
In wound	16 (7.5%)
On sterile field	91 (42.9%)
Nonsterile areas of the OR	79 (37.2%)
Unreconciled	26 (12.2%)

Steps Taken to Reconcile Sponge Counts

Step	Number of searches (% of searches)
Surgeon notified	84 (39.6%)
Wound searched	34 (16.0%)
Sterile field searched	164 (77.4%)
Nonsterile area(s) searched	124 (58.5%)
Additional personnel	24 (11.3%)
Other	14 (6.6%)

Intraoperative Radiographs

- 55 intraoperative radiographs
  - 25 taken during liver transplant per protocol
  - 24 due to missing sponge
  - 4 for emergency procedure (no initial count)
  - 2 for second look laparotomy procedures
- Surgical sites:
  - Abdomen, head & neck, leg, chest, spine, groin, hip, and hand

Time

- Time spent searching for missing sponge(s):
  - Ranged from one (1) to ninety (90) minutes
  - For 9 searches, nurses recorded number of minutes as "greater than 30" – analysis was done using 30 minutes
  - Overall time (1,700 minutes) is an underestimate of actual time

Use of Published Costs

- Average radiology costs = $286/patient[11]
  - Also included OR time associated with obtaining an intraoperative radiograph = 30 minutes[12]
- Operating time = $62/minute[13]
  - Conservatively estimated that 50% of the time spent searching for a missing sponge is nonproductive

Costs

- Annualized cost of time = $140,533
  - Adjusted annualized cost of time (assuming 50% nonproductive) = **$70,266**
- Cost of obtaining and reading radiographs = $14,872 + cost of OR time to obtain radiograph = $96,720
  - Combined annualized cost of obtaining, reading, and waiting for results = **$148,789**
- Total annualized cost of searching for missing sponges and using radiography to rule out the presence of a RSI = **$219,056**

Strengths and Limitations

Strengths

- Generalizability
- Large volume of cases = clinically relevant findings

Limitations

- Estimated costs are likely lower than actual costs
  - "Documentation fatigue"
- Time
  - Greater than 30 minutes = 30 minutes
  - Underestimated unproductive OR time
- Radiograph costs higher in other settings

Conclusions

- When considering the cost-effectiveness of adjunct technology, perioperative managers, directors, and value analysis teams often consider the cost of supplies (e.g. sponges) alone.
  - This limited view does not take into consideration the cost of current practices & “hidden” costs.

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