

There's Waldo! Standardized Workflow for Optimizing Communication for Retained Surgical Instruments



Sheila Berlin, MD, Peter Young, MD, Michael Wien, MD, Navid Faraji, MD

University Hospitals Cleveland Medical Center

Background



Retained surgical instruments (RSI) remain the most frequently reported sentinel event, occurring in approximately 1 in 1,000 to 1 in 18,000 surgeries.

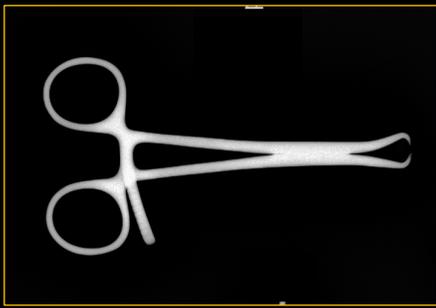


Approximately 90% of RSI events are attributable to team-based or systems errors.



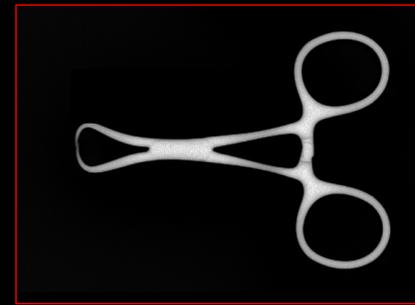
The cost of operating room time is reported to range from \$36 to \$155 per minute depending on the complexity of the case.

#10 Stainless Steel Blade



Bone Clamp

SMART Aim



Towel Clamp

To improve communication between surgeons and radiologists using a standardized workflow to expedite reporting times for intraoperative RSI radiographs.



4x 4 sponge

12 x 12 lap sponge



Methods



white towel

Prior to intervention, radiologist call-to-OR times (RSI TAT) for RSI results were inconsistent and often exceeded our target of < 15 minutes.

Technologists and radiologists identified factors contributing to delays:

- Information about the **type, expected appearance**, and **likely location** of the potential RSI was frequently missing.
- Intraoperative radiographs were frequently limited by **overlying non-biological material** in the surgical field, **incomplete visualization of the relevant anatomy** and **suboptimal technique** in a fully-draped patient.

Methods

A team of radiologists, surgeons and RT's designed a simple 3-step standardized workflow to optimize identification and minimize RSI TAT.

1. Send **RSI-in-Progress** Notification
2. Send **Simple 3-item OR Checklist Data**
3. Send **Sample Radiograph** of the Missing RSI (if any)

Standardized Workflow for Optimizing Communication for Retained Surgical Instruments

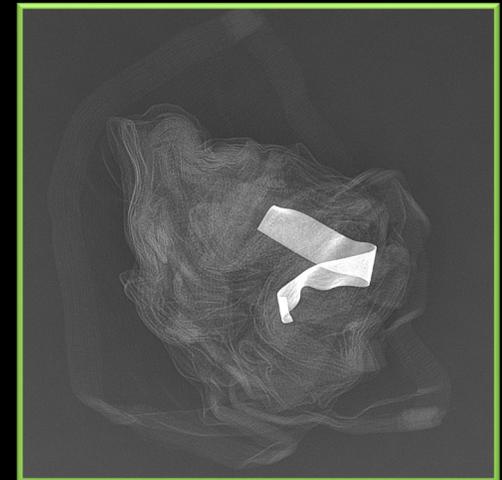
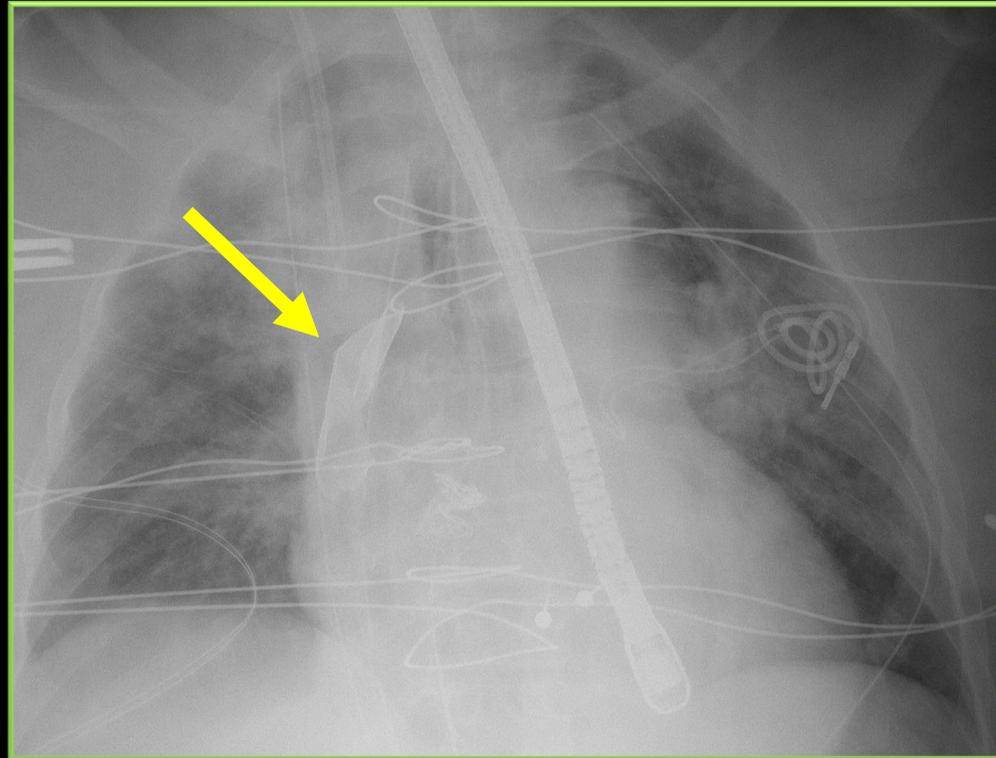
STEP 1: Send alert to radiologist

- 10 minutes ahead of anticipated completion: “RSI in Progress”
- Upon image transfer to PACS

STEP 2: Send OR checklist data to PACS

- ✓ **Procedure:** Median sternotomy with AVR RVOT repair
- ✓ **Surgical Field:** Chest cavity
- ✓ **Missing RSI:** White towel

STEP 3: Send sample radiograph of the missing RSI to PACS along with the intraoperative radiograph.



Methods

The impact of this workflow was assessed by comparing 40 consecutive RSI TAT for cases prior to workflow implementation to 40 consecutive RSI TAT for cases following workflow implementation.

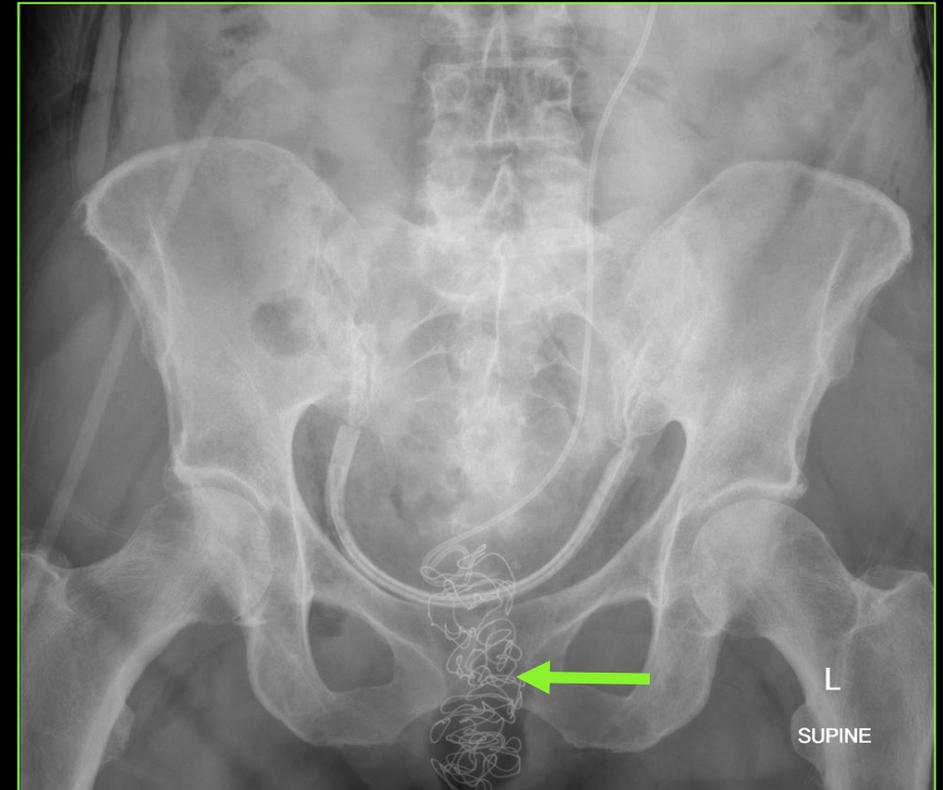
RSI TAT was measured as the time in minutes from radiologist notification of exam completion to the time a result was called to the OR.

Results

Following implementation of the standardized workflow, the mean TAT for communication with the OR team decreased from **17.7 ± 5.7 minutes** to **4.3 ± 1.9 minutes**.

- No RSI was identified prior to the workflow
- One RSI identified after workflow in place

Vaginal packing



Discussion

Our standardized workflow expedited time to surgical site closure by **improving TAT for RSI radiograph reporting**. A limitation of this study is that we did not have a process (e.g. follow-up post-op imaging) for determining accuracy of identification of RSI.

Using the core process improvement tools of **standardization** and **communication**, we developed a clear and detailed workflow to expedite results reporting for RSI radiographs.



References

- Chang F, Hong-Praslick C, Buchman T, Kirk A, Elster E. Estimating the Cost of Operating Room Time for Critical Care Patients. *Critical Care Medicine*. 2019(47): 41. doi: 10.1097/01.ccm.0000550874.97121.3f
- Eggl KD, Hess MA. Imaging the culprit's twin: search for the intraoperative retained foreign body. Retrieved on October 14, 2022 from https://www.rsna.org/uploadedFiles/RSNA/Content/Science_and_Education/Quality/3057-Eggl.pdf
- Gawande AA, Studdert DM, Orav EJ, Brennan TA, Zinner MJ. Risk factors for retained instruments and sponges after surgery. *N Engl J Med*. 2003 Jan 16;348(3):229-35. doi: 10.1056/NEJMsa021721.
- Porter KK, Woods RW, Bailey PD, Scott WW Jr, Johnson PT. Positive control radiographs for identifying a suspected retained surgical item. *J Am Coll Radiol*. 2015 Aug;12(8):830-2. doi: 10.1016/j.jacr.2015.03.043.
- Sentinel event. The Joint Commission. Retrieved on October 14, 2022 from <https://www.jointcommission.org/resources/patient-safety-topics/sentinel-event/>
- Stawicki SP, Moffatt-Bruce SD, Ahmed HM, et. al. Retained surgical items: a problem yet to be solved. *J Am Coll Surg*. 2013 Jan;216(1):15-22. doi: 10.1016/j.jamcollsurg.2012.08.026
- Stawicki SP, Cook CH, Anderson HL, et. al. Natural history of retained surgical items supports the need for team training, early recognition, and prompt retrieval. *Am J Surg*. 2014 Jul;208(1):65-72. doi: 10.1016/j.amjsurg.2013.09.029.
- Walter WR, Amis ES Jr, Sprayregen S, Haramati LB. Intraoperative radiography for evaluation of surgical miscounts. *J Am Coll Radiol*. 2015 Aug;12(8):824-9. doi: 10.1016/j.jacr.2015.03.005.
- Yun G, Kazerooni EA, Lee EM, Shah PN, Deeb M, Agarwal PP. Retained Surgical Items at Chest Imaging. *Radiographics*. 2021 Mar-Apr;41(2):E10-E11. doi: 10.1148/rg.2021200128.