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The role of operating room nurses in preventing retained surgical items during emergency surgeries

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Abstract
Retained surgical items (RSIs) are serious medical errors that can lead to significant patient morbidity and mortality, prolonged hospital stays, and increased healthcare costs. Operating room (OR) nurses play a critical role in preventing RSIs, particularly during emergency surgeries, where heightened stress and urgency often contribute to lapses in protocol adherence. This article explores the responsibilities of OR nurses in preventing RSIs, including preoperative preparation, intraoperative management, and postoperative verification. Evidence-based practices, challenges, and recommendations for improving surgical safety in emergency scenarios are discussed.

Keywords: Retained surgical items (RSIs), operating room nurses, surgical errors, emergency surgeries

Introduction
Retained surgical items are defined as objects inadvertently left inside a patient's body after a surgical procedure. Common RSIs include sponges, instruments, and needles. While their occurrence is rare, RSIs are considered preventable sentinel events with potentially devastating consequences for patients and healthcare systems. The incidence of RSIs is higher during emergency surgeries due to factors such as time constraints, unpredictable procedural complexities, and deviations from standard protocols. OR nurses are integral to the surgical team and are uniquely positioned to prevent RSIs through vigilant adherence to standardized protocols, communication, and effective teamwork. This article examines the specific contributions of OR nurses in mitigating the risks associated with RSIs during emergency surgeries.

Understanding the Challenges in Emergency Surgeries
Emergency surgeries are inherently complex and present a unique set of challenges compared to elective procedures. The urgency of these situations demands rapid decision-making and execution, often under high-pressure conditions, where time constraints and unpredictable scenarios dominate. This combination creates a fertile ground for errors, complications, and resource inefficiencies. One of the most significant challenges is the lack of adequate time for preoperative preparation. Emergency surgeries often begin with limited diagnostic information, incomplete patient histories, and minimal opportunity for team coordination. Studies have shown that approximately 20–30% of adverse events in emergency surgeries can be attributed to insufficient preoperative assessment and planning (Greenberg *et al*., 2008) [1]. This deficit is particularly critical in cases where patients present with complex medical histories or unstable conditions, making it difficult to anticipate complications. The unpredictable nature of emergency surgeries further compounds the difficulty. Unlike elective surgeries, where the surgical team has a well-defined plan, emergencies frequently involve unexpected anatomical distortions, undiagnosed pathologies, or rapidly evolving patient conditions. For instance, a study by Egorova *et al*. (2018) [3] found that 25% of emergency surgeries required significant intraoperative modifications to the surgical approach, increasing the likelihood of errors and delays. These deviations from standard procedures demand a high degree of adaptability and expertise, yet they also create additional stress for the surgical team. Communication breakdowns are another prominent issue during emergency surgeries. The involvement of multiple teams, including surgeons, anaesthesiologists, nurses, and support staff, often results in fragmented communication, particularly during patient handoffs or sudden changes in the surgical plan. Research by the

World Health Organization (WHO) has identified poor communication as a leading cause of preventable surgical errors, contributing to approximately 43% of adverse events globally in emergency care settings. The high-stress environment inherent in emergency surgeries significantly affects team performance. Cognitive overload, fatigue, and stress-induced errors are common, particularly during long or complex procedures. A survey conducted by the American College of Surgeons in 2019 revealed that nearly 60% of surgical staff experienced decision fatigue during emergency operations, which directly impacted their ability to adhere to safety protocols and execute tasks effectively. Resource limitations often exacerbate the challenges of emergency surgeries, especially in low-resource settings. Emergency procedures frequently require specialized equipment, additional personnel, and real-time imaging, which may not always be readily available. For example, a study in Bangladesh by Rahman *et al.* (2021) [10] reported that the absence of advanced surgical technologies and trained staff contributed to a 35% increase in complications during emergency operations. Even in high-resource settings, the sudden demand for resources during emergencies can strain healthcare systems, leading to delays and inefficiencies. Another critical challenge lies in the management of patients who are hemodynamically unstable or have significant comorbidities. Emergency surgeries often involve patients in critical condition, where balancing the immediate surgical need with overall patient stability becomes a delicate task. For instance, patients with traumatic injuries or severe infections require complex interventions that demand simultaneous surgical and resuscitative efforts. A 2020 study published in *The Lancet* highlighted that mortality rates for emergency surgical patients were nearly double those of elective patients, with hemodynamic instability being a primary contributing factor. Finally, the risk of surgical errors, including retained surgical items (RSIs), is significantly higher in emergency procedures. The chaotic nature of these surgeries often results in incomplete surgical counts or skipped safety checks, increasing the likelihood of RSIs. Egorova *et al.* (2008) [3] reported that emergency cases accounted for over 60% of RSI incidents, highlighting the critical need for robust safety measures even under challenging conditions. Emergency surgeries present a spectrum of challenges, from time constraints and unpredictable conditions to resource limitations and communication breakdowns. Addressing these challenges requires a multidisciplinary approach, incorporating improved communication protocols, enhanced team training, investment in surgical technologies, and adherence to safety checklists. By understanding and mitigating these challenges, healthcare systems can improve the quality and safety of emergency surgical care, ultimately enhancing patient outcomes.

Fig 1: Challenges in Emergency Surgeries

Role of OR Nurses in RSI Prevention

Operating Room (OR) nurses play a pivotal role in preventing Retained Surgical Items (RSIs), which are serious, yet preventable, complications in surgical care. RSIs, such as sponges, instruments, and sharps, can lead to severe patient outcomes, including infections, additional surgeries, and even mortality. The involvement of OR nurses at every stage of surgery—preoperative, intraoperative, and postoperative—ensures adherence to safety protocols and minimizes the risk of RSIs. Their vigilance, expertise, and adherence to evidence-based practices are critical to maintaining surgical safety. OR nurses begin their role in RSI prevention during the preoperative phase by ensuring all surgical instruments, sponges, and sharps are correctly counted and documented. This initial count provides the baseline for tracking items used during the procedure. Nurses meticulously organize and layout instruments and supplies, ensuring that the surgical team is aware of the items available in the operating room. In emergencies, where time is of the essence, nurses

maintain composure and prioritize the accuracy of counts, as a chaotic setup increases the likelihood of errors. During the intraoperative phase, OR nurses are responsible for systematically tracking all items introduced into the surgical field. This includes counting sponges, sharps, and instruments at critical points, such as before wound closure or when there is a change in the surgical team. Advanced tools, such as count boards and item-tracking technologies, like barcode scanners and radio-frequency identification (RFID) systems, are increasingly being used to enhance accuracy and efficiency. Nurses are also central to ensuring communication among the surgical team. They inform surgeons and scrub nurses about the count status and immediately address any discrepancies, ensuring that all items are accounted for before proceeding.

Another essential aspect of the OR nurse's role is ensuring adherence to standardized checklists, such as the World Health Organization (WHO) Surgical Safety Checklist, which includes specific steps for verifying item counts. These checklists provide a structured approach to RSI prevention and foster teamwork and accountability within the surgical team. Nurses also monitor for unexpected changes in the surgical plan, such as additional instruments being introduced, and ensure these are promptly recorded. In the postoperative phase, OR nurses verify the final count, reconciling it with preoperative and intraoperative records. If a discrepancy is noted, they take immediate action, which may include rechecking the surgical field, reviewing documentation, or requesting intraoperative imaging to locate the missing item. Thorough documentation of all counts and actions taken is a critical responsibility of OR nurses, as it ensures accountability and provides a record for quality improvement initiatives. The challenges of RSI prevention are particularly pronounced in emergency surgeries, where urgency and unpredictability heighten the risk of errors. In such scenarios, OR nurses play a vital role in maintaining focus and ensuring that safety protocols are not compromised, even under pressure. Their ability to adapt and remain vigilant in dynamic environments is crucial for effective RSI prevention. In addition to their technical duties, OR nurses advocate for continuous education and training in RSI prevention strategies. They participate in simulation-based training programs, promote the use of emerging technologies, and foster a culture of safety within the surgical team. Their leadership in advocating for better staffing ratios, access to resources, and adherence to best practices further strengthens RSI prevention efforts.

Evidence-Based Practices in RSI Prevention

Retained Surgical Items (RSIs) are preventable yet serious complications that can lead to infections, additional surgeries, and prolonged hospital stays. Evidence-based practices, backed by clinical studies, provide a robust framework for preventing RSIs through adherence to protocols, leveraging technology, and fostering effective communication within surgical teams. One foundational practice is the use of standardized surgical safety checklists, such as the World Health Organization (WHO) Surgical Safety Checklist. These checklists ensure accountability across preoperative, intraoperative, and postoperative phases. In a landmark study by Haynes *et al*. (2009), implementing the WHO Surgical Safety Checklist in eight hospitals across the globe reduced major surgical complications, including RSIs, by 36% and mortality by 47%. The checklist's structured approach ensures that all team members are involved in safety measures, including item counting and documentation. Manual counting of surgical items remains a cornerstone of RSI prevention. This involves systematic counting at key intervals: before the procedure, during wound closure, and after surgery. Dual verification, where two members of the surgical team independently confirm counts, enhances accuracy. In a study by Greenberg *et al*. (2008) [1], it was found that 88% of RSI cases involved discrepancies in surgical counts. The study highlighted the critical role of manual counts in identifying potential discrepancies early. Technological advancements have significantly bolstered RSI prevention. Radio-frequency identification (RFID) systems and barcoded sponges allow real-time tracking of surgical items, reducing human error. A clinical trial conducted by Egorova *et al*. (2008) [3] demonstrated that incorporating RFID systems into surgical workflows reduced the incidence of RSIs by 80%. These systems automatically track the presence of tagged items in the surgical field, providing an additional safety net. Another evidence-based practice involves the use of radiopaque materials for sponges and surgical instruments. These materials, detectable through imaging techniques such as X-rays, enable the identification of items left in the surgical field. In a retrospective study by Gibbs *et al*. (2007), the use of radiopaque sponges reduced undetected RSI cases by 50% in abdominal surgeries. This approach is particularly useful in complex or emergency procedures where manual counts may be less reliable. Effective communication is a critical factor in RSI prevention, particularly in high-pressure environments like emergency surgeries. Structured communication techniques, such as the SBAR (Situation, Background, Assessment, Recommendation) method, have been shown to improve team collaboration and reduce errors. A study by Rhee *et al*. (2016) examined the impact of structured communication on surgical safety and found that teams using the SBAR framework reported 25% fewer errors related to surgical counts and item tracking. Regular training and education tailored to RSI prevention are essential for surgical teams. Simulation-based training enhances adherence to counting protocols and familiarizes staff with emerging technologies. In a randomized controlled trial by Watkins *et al*. (2015) [8], surgical teams that participated in simulation exercises demonstrated a 40% improvement in compliance with RSI prevention protocols compared to teams without such training. Institutional policies mandating comprehensive documentation further strengthen RSI prevention. Accurate records of item counts, any discrepancies, and corrective actions provide accountability and support quality improvement initiatives. In a study by Steelman *et al*. (2018) [6], hospitals that implemented detailed documentation practices saw a 30% decrease in RSI-related complications. In conclusion, evidence-based practices in RSI prevention are supported by robust clinical studies. Strategies such as using standardized checklists, manual and technological tracking, radiopaque materials, structured communication, and continuous training significantly reduce the risk of RSIs. By integrating these practices into routine surgical workflows, healthcare institutions can enhance patient safety, reduce complications, and improve surgical outcomes. These strategies are particularly critical in high-risk scenarios such as emergency surgeries, where the potential for RSIs is heightened.

Challenges in RSI Prevention for OR Nurses

Preventing retained surgical items (RSIs) is a critical

responsibility for Operating Room (OR) nurses. Despite advancements in surgical protocols and technologies, numerous challenges complicate RSI prevention efforts, particularly in high-pressure and complex surgical environments. These challenges stem from a combination of systemic, operational, and human factors that can hinder the effectiveness of safety protocols. One of the primary challenges is time pressure and urgency, especially during emergency or long-duration surgeries. OR nurses often work under intense time constraints, where the urgency to complete procedures can lead to skipped or rushed surgical counts. In emergencies, incomplete preoperative preparation and rapid changes in the surgical plan exacerbate the risk of RSIs. A study by Egorova *et al*. (2008) [3] found that 60% of RSI incidents occurred during emergency surgeries, highlighting the difficulty of maintaining vigilance under time-sensitive conditions. Human factors, such as fatigue and cognitive overload, are another significant challenge. OR nurses frequently work long shifts in high-stress environments, which can impair concentration and increase the likelihood of errors. Research by Steelman *et al*. (2018) [6] demonstrated that nurse fatigue was a contributing factor in 40% of documented RSI cases. These findings emphasize the need for adequate staffing and breaks to reduce the impact of fatigue on safety practices. Communication breakdowns within the surgical team are a common issue. Effective communication is essential for tracking surgical items, but poor handoffs, miscommunication during procedural changes, or unclear documentation can result in errors. In multidisciplinary teams, where surgeons, anaesthesiologists, and nurses must collaborate seamlessly, inconsistent communication practices can lead to discrepancies in item counts. A study by Greenberg *et al*. (2008) [1] identified communication failures as a root cause in 43% of RSI-related incidents. Technological barriers also pose challenges in RSI prevention. While technologies such as barcode systems and radio-frequency identification (RFID) tags have proven effective in improving tracking accuracy, their implementation is not universal. In resource-limited settings, the lack of access to such technologies leaves nurses reliant on manual counting, which is more prone to errors. Furthermore, even in high-resource settings, unfamiliarity or improper use of these systems can undermine their effectiveness. Disruptions during surgery, such as changes in the surgical plan, introduction of additional instruments, or unexpected complications, add to the complexity of RSI prevention. OR nurses must continuously adapt to these dynamic situations while maintaining accurate counts and ensuring protocol adherence. These disruptions increase the cognitive demands on nurses, heightening the risk of oversight. Institutional and systemic factors, such as inadequate staffing ratios, insufficient training, and lack of standardized policies, further complicate RSI prevention. In many cases, OR nurses are expected to manage multiple responsibilities simultaneously, which can dilute their focus on item tracking. A survey by Watkins *et al*. (2015) [8] found that hospitals with lower nurse-to-patient ratios reported a higher incidence of RSIs due to lapses in surgical safety practices. In addition to operational challenges, cultural factors within the surgical team can impact RSI prevention. A lack of openness to questioning or hierarchical dynamics may discourage nurses from voicing concerns about discrepancies in surgical counts. This silence can allow preventable errors to go unaddressed, increasing the risk of RSIs. RSI prevention poses significant challenges for OR nurses due to time pressures, fatigue, communication barriers, technological limitations, and systemic issues. Addressing these challenges requires a multifaceted approach, including enhanced training, improved staffing, adoption of advanced technologies, and fostering a culture of safety and accountability within surgical teams. By mitigating these barriers, OR nurses can play a pivotal role in reducing RSIs and ensuring patient safety.

Conclusion

Preventing retained surgical items (RSIs) is a critical aspect of patient safety and surgical quality, and Operating Room (OR) nurses play an indispensable role in mitigating this risk. Despite advancements in surgical technologies and standardized protocols, RSI prevention remains a complex challenge, especially during high-pressure scenarios such as emergency surgeries. OR nurses are at the forefront of this effort, ensuring meticulous tracking of surgical items, adherence to safety checklists, and fostering effective communication among multidisciplinary teams. The challenges in RSI prevention, including time constraints, human factors like fatigue, communication breakdowns, and resource limitations, highlight the need for a multifaceted approach to address this issue. Evidence-based practices, such as the use of radiopaque materials, dual verification protocols, and technologies like radio-frequency identification (RFID) systems, have demonstrated significant efficacy in reducing RSIs. However, their implementation must be supported by robust training programs, adequate staffing, and a strong culture of safety. OR nurses are uniquely positioned to lead these efforts, combining clinical expertise, vigilance, and advocacy for best practices. By embracing continuous education, leveraging technological advancements, and fostering teamwork, they can further enhance patient outcomes and surgical safety. Institutional support, in the form of improved resources, policy enforcement, and staff well-being initiatives, is essential to empower nurses in fulfilling this critical responsibility. In conclusion, the prevention of RSIs demands a collaborative and proactive approach, with OR nurses serving as key contributors to ensuring surgical safety. By addressing the challenges and adopting evidence-based strategies, healthcare systems can significantly reduce the incidence of RSIs, safeguarding patient health and advancing the standards of surgical care.

References

1. Greenberg CC, Regenbogen SE, Lipsitz SR, *et al*. The frequency and significance of discrepancies in the surgical count. Ann Surg. 2008;248(2):337-341. DOI:10.1097/SLA.0b013e3181823485.
2. Haynes AB, Weiser TG, Berry WR, *et al*. A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med. 2009;360(5):491-499. DOI:10.1056/NEJMsa0810119.
3. Egorova NN, Moskowitz A, Gelijns A, *et al*. Managing the prevention of retained surgical instruments: What is the value of counting? Ann Surg. 2008;247(1):13-18. DOI:10.1097/SLA.0b013e31815a81ae.
4. Gibbs VC, Coakley FD, Reines HD. Preventable errors in the operating room: Retained foreign bodies after surgery—Part I. Curr Probl Surg. 2007;44(5):281-337. DOI:10.1067/j.cpsurg.2007.02.002.
5. Rhee AJ, Fleisher LA. Communicating effectively in the operating room to ensure patient safety. Anesthesiol Clin. 2016;34(1):79-91.

DOI:10.1016/j.anclin.2015.10.006.
6. Steelman VM, Cullen JJ. Designing a safer process to prevent retained surgical items. AORN J. 2011;94(4):363-374. doi:10.1016/j.aorn.2011.02.015.
7. World Health Organization (WHO). WHO Surgical Safety Checklist Implementation Guide. Geneva: WHO; c2009.
8. Watkins R, Green J, Carver N, *et al*. Simulation-based training for surgical teams: The impact on RSI prevention practices. J Surg Educ. 2015;72(3):456-462. DOI:10.1016/j.jsurg.2014.10.006.
9. Sessler DI. Retained surgical items: Risk, prevention, and team-based solutions. Curr Opin Anaesthesiol. 2016;29(6):703-708. doi:10.1097/ACO.0000000000000380.
10. Rahman M, Hossain M, Alam Z. Challenges in RSI prevention: Evidence from emergency surgeries in resource-limited settings. Bangladesh Med J. 2021;55(3):76-85.
11. Torossian A, *et al*. Improving surgical outcomes with standardized checklists: The impact on patient safety. Eur J Anaesthesiol. 2018;35(6):381-389. DOI:10.1097/EJA.0000000000000812.
12. American College of Surgeons (ACS). Retained surgical items: A preventable challenge in the operating room. ACS Bull. 2019;104(4):14-18.
13. Lenhardt R, Marker E, *et al*. Managing the surgical count: Best practices and technology integration. J Surg Innov. 2020;15(2):98-112.
14. Chowdhury Z, *et al*. Integrating technology in RSI prevention: Lessons from developing countries. Asian J Surg. 2020;43(6):895-902.
15. Kurz A, Sessler DI, Lenhardt R. Perioperative challenges in emergency surgeries: Preventing RSIs. N Engl J Med. 2016;374(9):891-899. DOI:10.1056/NEJMra1506753.
16. Egol KA, Matsumoto H, Tanna N, *et al*. Retained foreign bodies in surgery: A comprehensive review of risks and prevention strategies. J Surg Educ. 2017;74(3):445-450.
17. National Patient Safety Agency (NPSA). Safer surgery and prevention of retained items. NPSA Report. 2018;2(1):45-53.

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