

Beyond the Scalpel and Suture: The Critical Checklist for Surgical Safety in Operating room: A Unique Role of Nurse in Ensuring Compliance with Safety Protocols

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Abstract

The operating room (OR) is a theatre of precision, where surgical teams perform life-saving procedures daily. Amid the complex choreography of a surgery, patient safety remains paramount. Checklist, serve as a critical framework to minimize risks and errors. In this article, we will explore the importance of these protocols, and how nurses, often the unsung heroes, play a central role in ensuring their strict compliance.

Keywords: Surgical Safety; Surgical Checklist; Protocol; Operating Room; Nurses.

INTRODUCTION

The operating room is a facility within a hospital where surgical operations are performed in an aseptic environment.¹ In the operating room surgical teams perform life-saving procedures daily. The operating room is divided into sterile and non-sterile areas, and only sterile personnel can enter the sterile area where the surgical table and instruments are located.² The operating room

team consists of the surgeon, the anesthesiologist, the scrub nurse, the circulating nurse, and other healthcare professionals who coordinate their efforts to perform the surgical procedure.³ Amid the complex choreography of a surgery, patient safety remains paramount. Safety protocols in the OR, such as the World Health Organization (WHO) Surgical Safety Checklist, serve as a critical framework to minimize risks and errors.⁴ In this article, we will explore the importance of these protocols, and how nurses, often the unsung heroes, play a central role in ensuring their strict compliance.

Surgical safety is a multifaceted challenge. The OR is a dynamic environment with multiple team members, various responsibilities, and often high-stress situations. In such a context, safety measures are not only about avoiding errors but also about ensuring the smooth execution of a complex procedure. The WHO Surgical Safety Checklist is designed to address these challenges comprehensively.

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Incorporating Team Dynamics

Team dynamics play a pivotal role in surgical safety.⁵ The checklist incorporates a “Time-Out” phase, which is a designated moment for the team to come together and review the checklist items. During this brief pause, the team members, including surgeons, anesthesiologists, nurses, and other staff, have the opportunity to voice any concerns or questions. This shared decision-making process promotes a culture of teamwork and collaboration.

Nurses, as coordinators of the checklist process, are key drivers in creating a positive team dynamic.⁶ They encourage open communication and ensure that each team member actively participates in the “Time-Out.” This collaborative approach is vital for the success of the checklist, as it allows for the identification and resolution of potential safety issues before they become critical.

Patient Centered Care

At the heart of the checklist is the patient. It places the patient’s well-being and safety at the forefront of the surgical process. Before the surgical incision, the team reviews key patient-related information, including their identity, the surgical site, and any known allergies. This ensures that the patient’s unique needs and safety concerns are addressed.

Nurses are often the primary advocates for patients in the OR. They play a crucial role in confirming that the patient’s identity and other critical information align with the surgical plan. In this way, nurses are the patient’s voice in the checklist process, ensuring that their safety is the central focus of the surgical team.

The Critical Role of Patient Identification

Patient identification serves as the very foundation of healthcare delivery.⁷ Whether it’s during registration, medication administration, laboratory testing, surgery, or any other healthcare encounter, the right patient must receive the right care. The consequences of misidentification are far-reaching, leading to medical errors, misdiagnoses, and sometimes even life-threatening situations.

Ensuring that the correct patient is consistently matched with their medical records and treatments is a shared responsibility of every healthcare professional, from the front desk staff to the nurses, physicians, and laboratory technicians.

Challenges in Patient Identification

The healthcare ecosystem is not without its challenges when it comes to patient identification:

- **Common Names and Similar Demographics:** Patients with common names can pose a challenge, particularly if they share similar demographic information.
- **Human Error:** Manual data entry can introduce errors. A simple typographical mistake, such as a misspelled name or transposed digits in a birthdate, can lead to patient misidentification.
- **Lack of Unique Identifiers:** In some regions or healthcare systems, a lack of unique patient identifiers can make it more challenging to ensure accurate identification.
- **Patient Transfers:** When patients are transferred between departments or facilities, ensuring their continued accurate identification is crucial.

Strategies and Technologies for Precise Patient Identification

Efforts to enhance patient identification involve a combination of strategies and technologies:

- **Biometric Identification:** Biometric methods, such as fingerprint scanning, facial recognition, and retinal scans, are increasingly used to ensure accurate patient identification. These methods provide a high level of certainty and security.⁸
- **Barcode Technology:** Barcoded patient wristbands and medication containers are widely employed. Scanning barcodes helps verify patient identity and ensure that the right medications are administered.⁹
- **Radio-Frequency Identification (RFID):** RFID technology can be used for patient identification by embedding RFID chips in wristbands or identification cards. It enables real-time tracking and monitoring of patients.¹⁰
- **Two-Step Verification:** Implementing a two-step verification process, where healthcare providers cross-verify patient information, can enhance accuracy. For example, a nurse may ask the patient their name and birthdate before administering medication.
- **Electronic Health Records (EHRs):** Integrated EHR systems facilitate accurate patient identification by providing access to

comprehensive patient records and medical histories. EHRs also include features to flag potential identification errors.¹¹

- **Patient Engagement:** Engaging patients in the identification process by verifying their personal information can be a simple yet effective strategy to prevent misidentification.

The Role of Healthcare Providers

Healthcare providers play a pivotal role in ensuring precise patient identification:

- **Vigilance:** Healthcare professionals must be vigilant at every step, from registration to treatment. This includes checking patient identifiers, such as wristbands and identification cards.
- **Communication:** Effective communication within the healthcare team is essential to prevent identification errors. Clear and open communication ensures that everyone is aware of the patient's identity and treatment plan.
- **Patient Engagement:** Encouraging patients to actively participate in the identification process by confirming their personal information can help mitigate errors.

The Significance of Patient Positioning

Patient positioning is not a one-size-fits-all approach but a meticulous process, tailored to the specific needs of each surgical procedure. Proper positioning serves several crucial purposes:

- **Optimal Surgical Exposure:** The primary objective of patient positioning is to provide the surgeon with the best possible access to the surgical site. This includes maximizing visibility and reach while minimizing interference.
- **Patient Safety:** Correct positioning helps prevent complications such as pressure injuries, nerve damage, and joint strain. It also reduces the risk of airway obstruction during anesthesia.
- **Comfort:** Ensuring patient comfort is not just about improving the patient's experience; it's also about avoiding patient movement during surgery, which can be problematic.
- **Anesthesia Efficacy:** Proper positioning can enhance the effectiveness of anesthesia, as the patient's anatomical alignment affects the distribution of anesthetic agents.

Challenges in Patient Positioning

Patient positioning is a complex task, often fraught with challenges:

- **Variability:** Surgical procedures differ greatly, and the ideal patient position varies accordingly. From supine to prone, lithotomy, lateral decubitus, and sitting positions, the array of possibilities can be overwhelming.
- **Pressure Injuries:** Prolonged immobility in a single position can lead to pressure injuries. Preventing such injuries while maintaining proper surgical exposure is a delicate balance.
- **Equipment and Space:** The availability of appropriate positioning equipment and sufficient OR space is essential but not always guaranteed.
- **Patient-Specific Factors:** Individual patient characteristics, such as body habitus, preexisting medical conditions, and anatomical anomalies, further complicate the positioning process.

Best Practices and Innovations

Overcoming these challenges requires a combination of best practices and innovative solutions:

- **Team Collaboration:** A multidisciplinary approach involving surgeons, anesthesiologists, nurses, and other healthcare professionals is critical. Together, they can determine the best positioning strategy for each procedure and patient.
- **Positioning Devices:** Advanced positioning devices, such as gel pads, foam wedges, and vacuum bean bags, are designed to provide both optimal exposure and patient comfort.
- **Pressure Redistribution:** Regular position changes and pressure redistribution techniques can help prevent pressure injuries. This includes careful padding and padding inspections during lengthy surgeries.
- **Technology:** Surgical tables with articulating segments, adjustable heights, and radiolucent surfaces provide flexibility and facilitate complex procedures. Real-time imaging technologies can guide intraoperative adjustments.
- **Patient Education:** Educating patients about the importance of positioning, as well

as informing them about what to expect before and after surgery, can enhance their cooperation and comfort.

- **Continuous Monitoring:** Healthcare providers must continually monitor patient positioning during surgery to address any issues promptly.

The Significance of Surgical Appliances

Surgical appliances encompass a wide range of tools and devices, including surgical instruments, implants, and medical equipment used to support a variety of surgical procedures. Their significance can be understood through several key areas:

- **Precision and Efficiency:** Surgical appliances are crafted to enable precision and efficiency during surgical interventions. They provide surgeons with the tools they need to perform complex procedures with accuracy.
- **Patient Safety:** Many surgical appliances are designed with patient safety in mind. For instance, implants are created to be biocompatible and non-reactive with the patient's body, reducing the risk of complications.
- **Innovation and Advancements:** Advances in surgical appliances often drive innovation in surgical procedures. The availability of cutting edge instruments and equipment expands the possibilities of what can be achieved in surgery.
- **Patient Outcomes:** The choice of surgical appliances directly influences patient outcomes. For example, using the right type of suture material can affect wound healing, scarring, and infection rates.
- **Cost-Efficiency:** Surgical appliances can enhance cost-efficiency by reducing the duration of surgeries and the risk of complications. This ultimately benefits healthcare institutions and patients.

Challenges in Surgical Appliance Usage

While surgical appliances are invaluable, their utilization is not without challenges:

- **Quality Assurance:** Ensuring the quality and sterility of surgical appliances is a priority. Regular inspections and quality control measures are necessary to minimize risks.
- **Cost Management:** Some advanced surgical appliances can be costly, which can strain

healthcare budgets. Balancing the cost of these devices with their potential benefits is a common challenge.

- **Training and Proficiency:** Healthcare professionals need proper training to use surgical appliances effectively. Mastery of complex instruments and technologies may require ongoing education.
- **Regulatory Compliance:** Surgical appliances are subject to strict regulatory standards. Adhering to these standards and managing compliance is an ongoing responsibility for healthcare institutions.

Technological Advancements

Innovations in technology are shaping the landscape of surgical appliances:

- **Minimally Invasive Surgery:** Advancements in surgical appliances have fueled the growth of minimally invasive surgery, reducing recovery times and minimizing patient trauma.
- **Robotics:** Robotic surgical appliances are enhancing precision and enabling remote surgery, extending the reach of healthcare to underserved areas.
- **3D Printing:** Customized surgical appliances, such as implants and instruments, can now be created through 3D printing, tailoring solutions to individual patients.
- **Telemedicine:** Telemedicine technologies are integrating surgical appliances with real-time remote consultations, expanding access to specialized care.
- **Data Integration:** Surgical appliances are increasingly interconnected with electronic health records (EHRs) and data analytics, allowing for better tracking of outcomes and improved decision-making.

Sterility and Infection Control

Maintaining the sterility of surgical appliances is non-negotiable. Infections resulting from contaminated instruments or implants can lead to severe complications. To ensure sterility:

- **Strict Sterilization Protocols:** Healthcare facilities adhere to stringent sterilization procedures, including autoclaving, chemical sterilization, or sterilization by gamma radiation, depending on the appliance.
- **Single Use Instruments:** Some surgical appliances, like certain types of scissors or

scalpels, are designed for single use. This eliminates the risk of cross-contamination.

- **Packaging and Storage:** Sterile appliances are carefully packaged and stored to prevent exposure to contaminants until the moment of use.

Proper Handling and Usage

The correct handling and usage of surgical appliances are paramount to prevent accidents and errors:

- **Training and Proficiency:** Healthcare professionals undergo extensive training to use surgical appliances effectively. Continuous education and proficiency assessments are crucial.
- **Pre-operative Verification:** The surgical team confirms the presence and proper functioning of all necessary appliances before commencing the procedure.
- **Instrument Counts:** Counting instruments before and after surgery ensures none are left inside the patient, which can lead to postoperative complications.

Patient-Specific Considerations

Each patient is unique, and their specific characteristics and conditions may impact the choice and usage of surgical appliances:

- **Allergies and Sensitivities:** Allergies or sensitivities to materials used in surgical appliances must be thoroughly documented to prevent adverse reactions.
- **Anatomical Variations:** Patient-specific anatomical differences may require the use of specialized appliances to accommodate variations in size, shape, or pathology.
- **Implant Compatibility:** For implantable appliances, such as artificial joints or pacemakers, compatibility with the patient's physiology and existing implants is crucial.

Quality Assurance and Regulatory Compliance

Ensuring the quality of surgical appliances and compliance with regulatory standards are ongoing responsibilities:

- **Regular Maintenance:** Regular maintenance and inspection of appliances are essential to identify and address wear

and tear.

- **Adherence to Regulations:** Healthcare facilities adhere to strict regulatory standards governing the design, manufacture, and usage of surgical appliances.
- **Recall Awareness:** Healthcare providers remain vigilant about recalls or safety alerts related to surgical appliances, removing any affected appliances from circulation.

Emerging Technologies for Safety

Innovations in technology are transforming safety in surgical appliance usage:

- **Radiofrequency Identification (RFID):** RFID technology can track the usage and maintenance of surgical appliances, ensuring their safety and reducing the risk of misplacement.
- **Digital Records:** Electronic records provide detailed information about each surgical appliance's history, from sterilization to previous usage, aiding in quality control.
- **Augmented Reality (AR):** AR can guide surgeons in real time, ensuring the safe and precise use of surgical appliances during complex procedures.

Collaboration and Communication

Effective communication and collaboration among the surgical team are paramount for safety:

- **Briefings and Debriefings:** Preoperative briefings and postoperative debriefings are essential to review the status of surgical appliances and any issues that arose during surgery.
- **Open Communication:** Surgeons, nurses, and other team members must maintain open and clear communication to address any concerns or challenges related to surgical appliance usage.

The WHO Surgical Safety Checklist: A Pillar of Safety

The WHO Surgical Safety Checklist, introduced in 2008, represents a global initiative to reduce surgical complications and errors. This checklist, a simple yet powerful tool, is divided into three phases: Before Induction of Anesthesia, Before Skin Incision, and Before Patient Leaves the OR.

1. Before Induction of Anesthesia: In this phase, the team confirms essential information, including the patient’s identity, surgical site, and planned procedure. They discuss anticipated critical events, the patient’s allergies, and ensure all equipment and special requirements are available.

2. Before Skin Incision: This stage prompts a “Time-Out” in the OR. The team reconfirms the patient’s identity, the surgical site, the procedure, and any special concerns. They verify any anticipated issues and ensure all relevant imaging is displayed.

3. Before Patient Leaves the OR: This phase involves a final review of the patient’s identity, procedure, and surgical counts. The team discusses concerns, such as equipment problems or issues during the surgery, and confirms the postoperative plan.

The WHO Surgical Safety Checklist is a robust safety net. It has shown substantial reductions in complications and mortality when consistently followed. However, it’s only as effective as the adherence to it, and this is where nurses play a pivotal role.

Surgical Safety Checklist

World Health Organization

Patient Safety
A World Alliance for Safer Health Care

Before induction of anaesthesia

Before skin incision

Before patient leaves operating room

(with at least nurse and anaesthetist)

(with nurse, anaesthetist and surgeon)

(with nurse, anaesthetist and surgeon)

Has the patient confirmed his/her identity, site, procedure, and consent?

 Yes

Confirm all team members have introduced themselves by name and role.

Confirm the patient’s name, procedure, and where the incision will be made.

Has antibiotic prophylaxis been given within the last 60 minutes?

 Yes
 Not applicable

Nurse Verbally Confirms:

 The name of the procedure
 Completion of instrument, sponge and needle counts
 Specimen labelling (read specimen labels aloud, including patient name)
 Whether there are any equipment problems to be addressed

Is the site marked?

 Yes
 Not applicable

Anticipated Critical Events

To Surgeon:

 What are the critical or non-routine steps?
 How long will the case take?
 What is the anticipated blood loss?

To Surgeon, Anaesthetist and Nurse:

 What are the key concerns for recovery and management of this patient?

Is the anaesthesia machine and medication check complete?

 Yes

To Anaesthetist:

 Are there any patient-specific concerns?

To Nursing Team:

 Has sterility (including indicator results) been confirmed?
 Are there equipment issues or any concerns?

Is the pulse oximeter on the patient and functioning?

 Yes

Is essential imaging displayed?

 Yes
 Not applicable

Does the patient have a:

Known allergy?

 No
 Yes

Difficult airway or aspiration risk?

 No
 Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

 No
 Yes, and two IVs/central access and fluids planned

Source: <https://www.who.int/teams/integrated-health-services/patient-safety/research/safe-surgery/tool-and-resources>

The Nurse’s Role in Checklist Compliance

Nurses in the OR serve as the gatekeepers of safety. They are responsible for facilitating and ensuring compliance with the WHO Surgical Safety Checklist, a task that requires meticulous attention to detail, communication, and leadership. Here’s how nurses fulfill this critical role:

- **Checklist Coordination:** The circulating nurse often takes the lead in coordinating

the checklist. They ensure that it’s completed at the appropriate times and that all team members participate.¹²

- **Communication:** Effective communication is central to checklist success. Nurses ensure that team members actively engage in the “Time-Out” process, encouraging open dialogue. This step promotes a shared mental model among team members,

where everyone understands the plan and anticipates potential issues.

- **Advocacy:** Nurses advocate for patient safety. If a team member identifies a concern during the checklist, the nurse ensures that it is addressed before proceeding with the surgery. This advocacy is a crucial component of the “Time-Out” process.
- **Documentation:** Accurate documentation is a cornerstone of the checklist. Nurses complete the checklist, documenting the team’s responses and any concerns raised. This documentation serves as a record of due diligence in patient safety. Accurate and thorough documentation is a cornerstone of the checklist. Nurses meticulously document the team’s responses to each checklist item, including any concerns raised and the actions taken. This documentation serves as a record of the team’s commitment to patient safety and adherence to the checklist. Moreover, the checklist is not merely a procedural formality. It represents a profound commitment to accountability. By documenting their participation and responses, the surgical team, with nurses at the forefront, acknowledges their responsibility for the patient’s safety.
- **Continuous Education:** OR nurses receive ongoing education in the proper use of the checklist. They ensure that team members, including surgeons and anesthesiologists, understand the significance of the checklist and are aware of its critical role in patient safety. Incorporating the WHO Surgical Safety Checklist into the surgical workflow requires education and training. Nurses are instrumental in this process. They receive ongoing training and are often responsible for educating other team members about the checklist’s significance and proper use. Additionally, nurses take part in quality improvement initiatives related to the checklist. These initiatives are designed to identify any barriers to compliance and areas for improvement. Through these efforts, nurses continuously contribute to enhancing patient safety.
- **Quality Assurance:** Nurses are involved in regular quality assurance and improvement efforts related to checklist compliance.¹² These initiatives are designed to identify any challenges and opportunities for improvement in adherence to safety protocols.

The Impact on Patient Safety

The impact of the WHO Surgical Safety Checklist and its compliance is profound. Studies have shown that the checklist significantly reduces complications, mortality, and errors in the OR.¹³ By rigorously following the checklist, teams catch potential issues before they escalate, such as wrong-site surgeries or equipment problems. This translates to safer surgeries, shorter hospital stays, and improved patient outcomes.

In essence, the checklist is the embodiment of a commitment to patient safety in the OR. It represents a culture of vigilance, communication, and dedication to minimizing risks. This culture is cultivated and sustained by the entire surgical team, with nurses at the forefront.

Challenges and Continuous Improvement

While the WHO Surgical Safety Checklist has proven its worth, challenges in compliance still exist. These challenges may include resistance to change, time constraints, and occasional lapses in communication. Nurses are essential in addressing these challenges by providing leadership and a commitment to safety.

Continuous improvement is also fundamental. Safety protocols must evolve in response to emerging threats and technology. OR nurses are involved in staying updated on the latest research, guidelines, and technology that can further enhance patient safety in the surgical setting.

The Broader Impact

The impact of the WHO Surgical Safety Checklist goes beyond individual surgeries.¹⁴ Its consistent use has resulted in safer surgeries worldwide, reduced complications, and shorter hospital stays. This not only benefits patients but also reduces the economic burden on healthcare systems.

The success of the checklist is also reflective of a broader cultural shift in healthcare—a shift toward a safety-focused culture. This culture of safety emphasizes teamwork, open communication, and a relentless commitment to minimizing risks. Nurses, with their central role in checklist compliance, embody this culture daily in the OR.

CONCLUSION

Safety protocols in the OR, particularly the WHO Surgical Safety Checklist, serve as the backbone of patient safety. The meticulous compliance with

these protocols is not merely a series of checks and confirmations; it is a testament to the commitment of the surgical team, led by nurses, to ensure that every surgery is as safe as possible.

In the operating room, nurses are the unsung heroes who uphold the highest standards of safety. They advocate for patients, facilitate communication, and serve as the guardians of the checklist. Through their dedicated efforts, they have significantly reduced the risks associated with surgery, making the OR a place of not only medical excellence but also the epitome of patient safety.

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