

Beyond the Sterile Field: Operating Room Complexity and Challenges from a Nurse's Perspective

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ABSTRACT

Background: The operating room (OR) is a highly specialized environment that requires seamless collaboration among multidisciplinary teams. Nurses play a pivotal role in ensuring patient safety, maintaining sterility, and supporting surgical outcomes. Despite their essential contributions, the complexity and challenges of perioperative nursing are often underrecognized.

Introduction

The operating room (OR) has long been portrayed as the pinnacle of medical advancement a place where science and skill converge to save lives. Yet, for nurses who work inside this high-stakes environment, the OR is not just a workplace but a dynamic, complex, and demanding ecosystem. Nurses are vital members of surgical teams, bridging the gap between patient advocacy, technical precision, and interprofessional collaboration. Their responsibilities extend beyond simply assisting surgeons; they ensure sterility, manage communication, and safeguard patients during their most vulnerable moments. This paper examines the complexity and challenges of the operating room from the perspective of nurses, drawing upon established nursing theories, perioperative literature, and contemporary research.

The Multifaceted Role of the Operating Room Nurse

Operating room nurses perform highly specialized roles that are essential to the success of surgical care. They generally function as scrub nurses or circulating nurses. Scrub nurses maintain the sterile field, manage surgical instruments, and anticipate the needs of surgeons during procedures. Circulating nurses, in contrast, operate outside the sterile field, coordinating the overall environment, ensuring adherence to safety protocols, documenting the procedure, and advocating for the patient throughout the operation [1]. Both roles require clinical expertise, sharp situational awareness, and strong communication skills.

Patient Advocacy in Silence

Perhaps the most profound responsibility of OR nurses is patient advocacy. Once patients undergo anesthesia, they lose the ability to protect their dignity, voice concerns, or confirm their treatment. The nurse becomes their voice. Advocacy may include verifying the correct patient and surgical site, ensuring safe positioning to prevent nerve damage, or calling attention to any protocol violations. Speaking up in the OR is not always easy due to hierarchical structures, but the nurse's ethical obligation to protect the patient supersedes concerns about authority [2]. This silent guardianship highlights the moral dimension of perioperative nursing practice.

Team Dynamics and Interprofessional Communication

Operating rooms bring together diverse professionals: surgeons, anesthesiologists, technicians, and nurses. Each has distinct responsibilities and training backgrounds, which can create challenges in communication and collaboration. Nurses often function as the glue that holds the team together, facilitating clear information exchange in high-pressure contexts [3]. Poor communication has been linked to adverse outcomes and surgical errors, while effective teamwork is consistently associated with improved patient safety [4]. Thus, OR nurses are not only caregivers but also mediators of team dynamics, a role that requires emotional intelligence and professional confidence.

The Challenge of Time and Scheduling

Time is an omnipresent pressure in the OR. Hospitals operate on strict surgical schedules, and each delay can cascade into disruptions for multiple patients. OR nurses are at the center of this balancing act. They must ensure rapid room turnover between cases while maintaining uncompromised standards of sterility and safety. Emergencies, unexpected complications, or extended procedures often require nurses to reorganize priorities quickly and flexibly [5]. This constant negotiation between efficiency and safety underscores the complexity of perioperative nursing.

Infection Control and the Sacred Duty of Sterility

Infection prevention is one of the most challenging yet essential responsibilities in the OR. Nurses maintain sterile fields, monitor aseptic techniques, and act immediately when a breach occurs. The concept of “surgical conscience” a nurse’s unwavering commitment to correct any break in sterility regardless of personal or professional repercussions remains foundational in perioperative practice [1]. Given that surgical site infections are among the most serious postoperative complications, the vigilance of nurses in maintaining sterility directly impacts patient outcomes.

Technology: Tool and Challenge

Modern operating rooms are filled with sophisticated technologies laparoscopic towers, robotic systems, digital imaging, and advanced anesthesia monitors. While these tools enhance precision and surgical outcomes, they also add layers of complexity for nurses. OR nurses must remain proficient in operating equipment, troubleshooting malfunctions, and adapting to continuous innovations [6]. The technological density of the OR increases both cognitive and physical workload, demanding ongoing training and resilience from nurses.

Human Factors: Fatigue, Stress, and Emotional Burden

Operating room nursing is both physically and emotionally demanding. Long procedures require nurses to stand for hours, often in lead aprons during radiologic interventions. Irregular hours, night shifts, and emergency call duties contribute to fatigue and stress. Emotional strain is heightened in cases with poor outcomes, such as intraoperative deaths or unexpected complications [3]. Fatigue is more than an inconvenience; it impairs judgment and concentration, increasing the risk of human error [7]. OR nurses, therefore, face a dual challenge: maintaining peak performance under intense physical conditions and coping with the emotional toll of high-stakes care.

Ethical Challenges in the OR

Ethical dilemmas are common in perioperative nursing. Nurses may witness unsafe shortcuts, questionable surgical decisions, or pressure to prioritize efficiency over patient-centered care. They must balance their loyalty to colleagues with their ethical duty to advocate for patients [8]. This balancing act often leads to moral distress, where nurses feel powerless to act in alignment with their values. Addressing these ethical challenges requires institutional support, open communication, and strong ethical frameworks within surgical teams.

Crisis Management and the Nurse as Anchor

When emergencies occur in the OR massive bleeding, cardiac arrest, or equipment failure nurses are often the anchors that

hold the team steady. Scrub nurses must deliver instruments instantaneously, while circulating nurses coordinate additional resources, summon help, and maintain clear documentation. Their calm, structured response amidst chaos is critical to patient survival [5]. Simulation-based training programs have become increasingly common, helping nurses prepare for crisis scenarios in safe learning environments [9].

Financial and Institutional Pressures

Hospitals view operating rooms as centers of both care and revenue. This financial lens creates institutional pressures on OR nurses, including expectations for rapid case turnover, cost efficiency, and resource management. Staffing shortages can intensify workload, leading to burnout and reduced patient safety [3]. Nurses must constantly navigate these systemic realities while striving to uphold patient-centered care.

Professional Growth and the Novice-to-Expert Journey

OR nursing is a lifelong journey of growth. Patricia Benner’s Novice-to-Expert model provides a useful framework to understand how nurses evolve in competence. Novices depend on rules and guidelines, while experts rely on intuition and deep experiential knowledge. The OR, with its dynamic complexity, demands constant learning, reflection, and adaptation [10]. Continuing education and mentorship are essential to support new nurses transitioning into this challenging specialty [11].

Conclusion

From maintaining sterile environments to advocating for patients, from managing advanced technologies to navigating interprofessional dynamics, nurses in the operating room carry immense responsibilities. The OR is not only a technical environment but also a moral, emotional, and professional one. The challenges fatigue, ethical dilemmas, infection control, time pressures, and institutional demands are vast. Yet, these very challenges highlight the critical and irreplaceable role of nurses.

Behind every surgical success lies the silent strength of operating room nurses: professionals who blend compassion with precision, advocacy with resilience, and vigilance with adaptability. They are the unsung heroes who ensure that the sterile field remains not only a space of technical mastery but also one of humanity and hope.

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