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# The Nurse's Role in the Perioperative Experience, with an Emphasis on Infection Control

## **Abstract**

"The Nurse's Role in the Perioperative Experience, with an Emphasis on Infection Control" provides an overview of the registered nurse's contribution to patient safety and infection prevention perioperatively. Each phase of the perioperative experience is outlined, from pre-operative events to PACU and discharge. Topics discussed include patient teaching, perioperative personnel roles, surgical disinfection measures, basic principles of sterile technique, post-operative complications and infection, and antibiotic therapy. The goal of this research paper is to inform readers about the importance of surgical infection control practices. In addition, the registered nurse is admonished to evaluate his/her practice, in order to serve more effectively as patient advocate.

**RUNNING HEAD: Perioperative Infection Control**

The Nurse's Role in the Perioperative Experience

with an Emphasis on Infection Control

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The surgical team (consisting of the surgeon, anesthetist, and perioperative nurses) has the formidable task of performing over 23 million surgeries each year in the U.S. Each member of the surgical team is important, but perhaps none as important as the perioperative nurse. As the patient's advocate, the nurse ensures patient safety and provides holistic care in each phase of the surgical experience. This research paper focuses on the nurse's role in the perioperative process, with an emphasis on infection control practices in the OR.

Surgery places serious physiological demands upon the body, and each member of the perioperative team must be concerned with the patient's safety, particularly prevention of infection. The first member of the perioperative team is the preoperative nurse. He or she has the responsibility of ensuring the patient is physically prepared to undergo surgery. The preoperative nurse assesses the patient's compliance with preoperative orders (e.g. NPO status), performs patient testing (e.g. pregnancy tests), reviews the release forms, and assesses the patient's current level of wellness (some illnesses may disqualify the patient from undergoing surgery, or will require additional monitoring [infections from cold or flu]). The preoperative nurse has the important task of patient education; this will include teaching regarding the surgical procedure, medications to be administered, anticipated time of discharge, and post-operative restrictions. *Medical-Surgical Nursing* notes that "Preoperative teaching increases patient satisfaction and may reduce postoperative fear, anxiety, and stress. Teaching may also decrease complications, the duration of hospitalization, and the recovery time following discharge" (Lewis, 350). It is imperative that the preoperative nurse assess the patient's

emotional state and provide support accordingly. As the patient's advocate, the preoperative nurse is aware of the patient's individual, cultural beliefs that may affect the patient during the perioperative experience. Another responsibility of the preoperative nurse is taking the patient's vital signs, administering intravenous fluids, antibiotics, sedatives/amnesia-inducing agents, antiemetics, and opioids. He/she may need to insert a urinary catheter to prevent uresis while the patient is under anesthesia or to prevent urinary retention postoperatively. This is important because urination during surgery could contaminate the surgical site and cause infection. Also, urinary catheter placement allows for easier assessment of urine output and fluid balance. Then, the patient is ready to be transported to the operative suite, where the circulating nurse has prepared all the surgical equipment necessary for the patient's specific surgery. The circulating nurse assures sterility of instruments, which means "Instruments should have been stored within the correct temperature range, on suitable racks, and protected from direct sunlight" (Pirie). Together with the surgical technicians, the circulating nurse positions the patient and secures him/her to the operating table. The circulating nurse is also responsible for ensuring all the operating equipment is connected and functioning properly. The scrub nurse or scrub technician plays an important role in maintaining asepsis, thereby reducing the chance for infection. He or she is responsible for scrubbing the patient's surgical site (reducing the number of potentially pathogenic microbes present), managing the sterile field, and arranging the sterile instruments. The anesthesiologist or nurse anesthetist intubates the patient, administers anesthesia, and carefully monitors the patient's vital signs, as "...the side effects of anesthetic agents

[include] cardiovascular depression or irritability, respiratory depression, and liver and kidney damage” (Potter & Perry, 1392).

The surgeon actually performs the surgery and thus has the greatest legal responsibility for the patient’s well-being. However, all members of the surgical team work diligently to anticipate potential problems, reduce surgical infection risk, and formulate interventions for the best possible patient outcome.

A flurry of activity begins as soon as the patient enters the surgical suite. After the patient is secured to the operating table, the anesthetist performs induction, which “...includes the administration of anesthetic agents and endotracheal intubation” (Potter & Perry, 1392). To reduce pathogenic microbes, the patient’s surgical site is scrubbed with alcohol, chlorahexadine, or betadine. Sterile drapes are placed over the patient’s entire body, with only the area to be operated upon visible. This limits microbial access to the surgical site, thus helping prevent infection. Once the patient is ready for surgery, the surgical team members take a time out. “ The Universal Protocol (Patient Safety First initiative) includes a preoperative verification process; a process to mark the intended site of the procedure; and a ‘time out’ immediately before the procedure commences to verify the correct patient; procedure; and site, including laterality” (Watson). After time out, the surgeon is free to begin the actual surgery. The surgeon stands closest to the surgical site, and the scrub nurse and technician stand between the surgeon and instrument tables. A circulating nurse stands away from the operating table but remains in the operating suite at all times. He/she may need to gather additional instruments if the surgeon encounters an unanticipated problem during surgery. The patient’s vital signs, blood loss and hydration status are monitored continually; alterations may warn of a life-threatening

complication. Before the surgeon closes the surgical site, the scrub team performs a count, in which all instruments, sutures, and gauze are counted. This ensures that no foreign objects are left inside the patient's body. "Any retained foreign body (eg, suture materials, prosthetic devices, drains) may promote inflammation at the surgical site and increase the probability of SSI [Surgical Site Infections] despite otherwise benign levels of tissue contamination" (Twomey). After the count, the surgical site is closed with sutures, completing the surgical procedure. However, the patient must still be brought back to consciousness, cleaned, and brought off the ventilator. Vital signs are particularly important immediately after the operation and reflect the patient's physiological stability. Once the patient is stable, he/she is ready to be transported out of the operating suite into PACU, where a nurse assesses the patient continually and administers pain medication. If the patient is to be discharged from the hospital, the PACU nurse is responsible for determining patient readiness. Kingdon and Newman, contributors to *AORN*, note five discharge criteria nurses use: "...whether the patient has stable vital signs, is able to void, tolerates fluids by mouth, is able to ambulate, and has transportation home...outpatient surgery nurses must use their own judgment in determining patient discharge readiness". If the patient is to remain in the hospital post-operatively, the PACU nurse gives report to the floor nurses. A thorough report will include intravenous fluids given, estimated blood loss, laboratory results, antibiotics given, urinary catheter placement, and urine output. If all the operative events go as planned, the patient has a higher quality of life post-operatively. However, deadly complications can arise in any phase of the perioperative experience.

Prevention is the most effective defense against infection- one of the most dreaded postoperative complications. According to the Centers for Disease Control (CDC), "...surgical site infections are the third most frequently reported nosocomial infection, accounting for 14% to 16% of all nosocomial infections among hospitalized patients. Seventy seven percent of patients' deaths were related to infection, and the majority (i.e., 93%) were related to serious infection involving organs or spaces accessed during procedures" (Twomey).

Prevention of surgical infection requires nurses take special precautions to reduce microbial contamination. The surgical hand scrub is a pre-operative precaution that requires all sterile members of the surgical team to vigorously wash their hands up to the elbows in a complex ritual for at least three minutes. Once the scrub member has completed the hand wash, he/she aseptically dons sterile gloves and a sterile gown. If the surgical site needs to be shaved, "Hair removal with clippers [is] to be conducted as close as practical to the time of surgery, preferably less than 2 hours prior to surgery, to prevent surgical site infection"(Best Practice). The patient's incision site is thoroughly scrubbed with an antimicrobial solution. This solution is scrubbed in a circular motion, starting at the intended incision site and moving outward; this practice reduces the likelihood of surgical site infection. M. Leonard, SRN says that "In view of the risk that any skin bacteria remaining after disinfection may contaminate the surgical wound and cause infection, it has become practice to cover the skin of the operative area with sterile adhesive plastic material and to make the incision through this material; most theatre nurses will be familiar with Opsite and Steri-Drape, which are used particularly in surgery where the success of prosthetic implants may be compromised by bacterial

invasion.” Opsite promotes wound healing by keeping the site moist, but is impermeable to bacteria. During surgery, the number of personnel allowed into the surgical suite is kept to a minimum; this also reduces the likelihood of surgical site infection. All scrubbed members touch only sterile items, reducing the risk of cross-contamination. Post-operatively, the patient’s wound is covered with a dressing to limit bacterial access to the surgical site. Instruments used during surgery are transported to the disinfection room and sterilized in the instrument case, then sorted into new cases and re-sterilized by autoclave. Special packaging prevents contamination of the instruments after sterilization, keeping the instruments sterile until surgical use. Antibiotics eradicate bacteria that are present despite infection control practices. They are often given during each phase of the perioperative experience, are started intravenously pre-operatively, and may continue to infuse during the operation. Post-operatively, antibiotics may continue to be given intravenously or orally. Frequently prescribed antibiotics include Cephalosporins (e.g., Cefazolin), Penicillins, and Aminoglycosides (e.g., tobramycin) (Martin), but the prescribed antibiotic will vary depending on the surgical site, operation, and any patient allergies. In some cases, infection control practices and antibiotics fail, and the patient experiences post-operative infection.

The consequences of surgical site infection are quite costly, and in many cases, deadly. *AORN Journal* reports that “500,000 to one million of the 23 million surgical procedures performed annually in the United States result in surgical wound infections” (Twomey). This not only results in great expense, but greatly increases the number of days the affected patient must spend in the hospital; “...the average length of stay for

patients who developed infected surgical wounds was 14.5 days. Patients who did not develop infections spent an average of 4.7 days in the hospital...nosocomial surgical wound infections added 2,601 inpatient days... (And) \$1.9 million [estimated cost per facility per year]" (Twomey); these statistics reinforce the necessity of scrupulous infection control practice. As the patient's advocate, nurses must diligently work to ensure all members of the perioperative team observe infection control precautions, limiting the number of patients' victim to post-operative infection.

This research paper has examined the role of the perioperative nurse, highlighting infection control practices in the operating room. The perioperative experience has been examined from pre-op to PACU, with an emphasis on patient safety and infection prevention. Also, consequences of sterile technique failure have been examined. In conclusion, the importance of the role of the registered nurse functioning as patient advocate in the surgical environment is paramount. It is imperative for the nurse to constantly strive to provide the patient the best surgical outcome: the patient recovering from surgery without infection or complications and in better physical and emotional health than when he/she began the perioperative journey.

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