Partnering With Perioperative Colleagues to Prevent Infection

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Surgical site infections (SSIs) continue to be a substantial cause of morbidity, lengthened hospital stays, and death despite advances in practices to control infection.[1] In addition, the cost associated with each SSI "increases with the depth of the infection and can reach more than $30,000 per case for the more serious infections."[2] The risk of infection and its management may depend upon the location of the facility where the surgical procedure is performed.

The surgical team must work together to provide optimal care for each patient and prevent SSIs. The infection prevention team is charged with considering each aspect of the patient's surgical procedure and care and assigning levels of risk. Examples of risks include diabetes, obesity, or history of multidrug-resistant infections. After risks are identified, evidence-based interventions (eg, control of blood sugar, weight-based antibiotic dosing, specific antibiotic ordering) can be implemented to address the identified risk. It is essential that staff members in perioperative settings promote a culture that supports the critical partnership with infection control and infection prevention personnel that is essential to a surgical program's success. Infection prevention staff members must take the time to build relationships with personnel in all perioperative settings to promote safe patient care and to provide specific guidance that drives best practices. Having a dedicated infection preventionist with perioperative experience assigned to the preoperative, operative, and postoperative areas is key to building these relationships.

Many perioperative guidelines recommend evidence-based practices to reduce the risk of SSIs. The infection preventionist is often the subject matter expert on these guidelines and protocols and is charged with identifying and validating guidelines and ensuring that all guidelines are followed. The surgical team relies on many standards and guidelines to drive best practice, such as the AORN *Guidelines for Perioperative Practice*,[3] which are used by surgical team members to achieve optimal levels of technical and aseptic practice. AORN guidelines provide guidance and information, but institutions must establish their own policies and procedures that incorporate the guidelines. Some guidelines are more accepted by surgical teams than others, and staff members may challenge guidelines that do not support their current practice. The following review addresses the areas in which collaboration between surgical team members and infection control personnel is essential for the best patient outcomes. These areas include surgical attire, standard and transmission-based precautions, aseptic technique, safe surgical environment, use of urinary catheters, and antibiotic stewardship.

SURGICAL ATTIRE

Surgical attire is one area that is often debated as to whether the evidence necessitates that a specific standard or recommendation be followed, and the decision instead may be driven by the culture of the organization. According to the AORN "Guideline for surgical attire,"[4] all surgical team members must wear scrub attire that is freshly laundered by a health care–accredited laundry facility to reduce the number of microorganisms in the surgical environment. The attire must be changed daily or when soiled or contaminated. Hair, which can harbor bacteria, should be completely covered by a hat, and facial hair should be contained. All types of false nails have been shown to harbor microorganisms and can

https://doi.org/10.1016/j.aorn.2017.10.007

inhibit effective hand hygiene, so fingernails should be clean and short.

STANDARD AND TRANSMISSION-BASED PRECAUTIONS

Standard precautions, which apply to all patients across all health care settings, represent the foundation for preventing the transmission of infectious diseases and include practices related to hand hygiene, the use of personal protective equipment, patient resuscitation, environmental control, respiratory hygiene and cough etiquette, sharps safety, and textiles and laundry.[5] For patients with known infections, one or more categories of transmission-based precautions are indicated, depending on the route of transmission. Contact precautions are indicated for patients who have been identified with methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant enterococci, or a multidrug-resistant organism that is spread by contact. Contact precautions are also implemented for patients with diarrhea illnesses such as *Clostridium difficile* infection. These precautions may include additional interventions to reduce the risk of transmission, including hand washing in addition to using alcohol-based hand cleansers and conducting environmental cleaning with bleach-based products that kill bacterial spores. Droplet precautions are indicated for patients with specific respiratory tract infections such as pertussis or *Neisseria meningitidis* infection. When caring for these patients, staff members should wear surgical masks when within three feet of infected patients. Airborne precautions or airborne infection isolation is indicated for patients with suspected or confirmed infections with *Mycobacterium tuberculosis*, varicella zoster, or disseminated herpes zoster. For airborne infection isolation, staff members must wear N95 respirator masks for which they have been fit tested.[6]

ASEPTIC TECHNIQUE

Aseptic technique principles play a critical role in achieving asepsis in the OR, thus, every surgical team member should understand these principles and incorporate them into daily practice. Aseptic technique principles include staff members being scrubbed in a sterile field, draping and care of items in the sterile field, and monitoring and maintenance of the sterile field, which should be prepared as close as possible to the time of use.[7] Aseptic technique also requires a culture of safety in which personnel are encouraged to speak up if they see a breach in aseptic technique at any time during a procedure.

A focus on machinery or computer screens can distract surgical staff members and result in unintentional breaches in practice. In addition, the machinery and technology can complicate the footprint of the surgical environment, inhibiting cleaning and adding to environmental contamination. Traffic in and out of the OR by nonessential personnel or vendors, who may move from nonsterile areas to the sterile field, also can be a distraction and compromise the margin of safety around patients.

SAFE SURGICAL ENVIRONMENT

It is well established that the surgical suite must continually be monitored for temperature, humidity, ventilation, and air flow. The positive pressure environment and high-efficiency particulate air filtration, as well as the number of air changes per hour (20 air changes per hour), are parameters that must be evaluated to ensure that each patient is cared for in a safe space.[8] Surgical staff members must be aware of these parameters so that any variance can be reported and rectified as soon as possible. Infection prevention staff members must also assess these elements in the surgical suite(s) during environmental rounds and remind staff members of the importance of these parameters and what to do in the event of system failures.

A safe surgical environment also involves the cleaning of routine and procedure-related OR equipment. The infection prevention team guides the choice of disinfectants in perioperative services, ensuring that the best disinfectant is used, depending on the type of equipment and the instructions for use. Products with long dwell times are often used inappropriately or wiped off before they dry. Staff members need to recognize that these products do not provide adequate cleaning and disinfection unless allowed to remain on surfaces wet for the prescribed time. Allowing for the proper dwell time of the disinfectant is critical to help ensure that the equipment is safe for use on the next patient.[9]

Environmental rounds in the OR can be used to assess additional cleaning practices; during rounds, the infection prevention team can also address damaged or worn equipment that cannot be cleaned adequately and needs to be replaced. A new set of eyes will often detect subtle risks that may be overlooked by staff members who see the same equipment daily.

Patient flow and throughput can be disrupted when the structural facility no longer meets the space requirements for additional or advanced procedures that require additional staff members or more equipment. The pressure to perform more procedures and adhere to time constraints can make people take shortcuts. Shortcuts that are potentially harmful may include prespiking of IV bags (risk of contamination or