The role of the infection preventionist in the OR

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The Centers for Disease Control and Prevention (CDC) estimates that approximately 16 million operative procedures are performed in U.S. hospitals each year.[1] Although great strides have been made in infection prevention, including improved ventilation, sterilization methods, barriers, surgical techniques, and antimicrobial prophylaxis, surgical site infections (SSIs) remain a significant cause of patient illness, and in some cases, death.[2] In addition, SSIs add significant costs to health care. Surgical site infections are one of the most common types of health care-associated infections (HAIs) and account for more than 30 percent of all HAIs among hospitalized patients.[3] Data from the CDC indicates an average SSI rate of 1.9 percent in the nation.[4]

The APIC IP Competency Model

The Association for Professionals in Infection Control and Epidemiology (APIC) Infection Preventionist (IP) Competency Model[5] illustrates four critical areas of expertise in the IP role: infection prevention and control, performance improvement and implementation science, leadership and program management, and technical. This conceptual model not only describes current successful IP practice, but is also designed to emphasize areas that will be especially critical in the next three to five years. The model is viewed by APIC as part of the association's long-standing efforts to define and advance the profession.

The competency model's content areas correspond to the IP's core competencies as defined by the Certification Board of Infection Control and Epidemiology. Board certification in infection prevention is critical to professional development, representing the bridge between the novice and the proficient professional. Each of the areas of expertise in the IP Competency Model are used when the IP engages with perioperative personnel.

The following are some examples of IP actions relative to perioperative services for each of the four cornerstones of the IP Competency Model:

1. Infection prevention and control

Surgical procedure observations: In a best practice model, the IP might make routine observations of surgical procedures at the invitation of the perioperative department. Each observation ideally would begin with an introduction of the IP to the team by the perioperative manager. The IP might work with the OR manager in advance to identify the key prevention practices or products to include on a checklist that the IP can use to guide the observation. Examples include proper application of surgical skin preparation solution, use of a dual-agent skin prep, proper timing of preoperative antibiotics and re-dosing for prolonged cases, and keeping the Foley drainage bag off the floor.

Following the procedure, the IP might provide a debriefing session with the perioperative manager and ideally, the surgeon. The debriefing should include not only observed best practices, but also areas of opportunity for reducing infection risk. This meeting would also afford the IP an opportunity to ask questions regarding the surgical procedure; surgical instrument design, especially designs that make instruments difficult to clean; point-of-use decontamination; OR and instrument reprocessing workflow; and other aspects to help improve learning and communication.

2. Performance improvement and implementation science

New product implementation: If the SSI rate spikes for any procedure, perioperative personnel should collaborate with the IP to analyze the SSI data, determine where there is opportunity to improve SSI prevention practices, and develop a plan of action. This process should include an examination of whether basic prevention practices are reliably and consistently implemented and whether there are products or practices that should be added. The IP should track evolving evidence supporting prevention products and practices and advise perioperative staff members regarding which products or practices could be introduced to reduce the risk of infection, such

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as nasal decolonization of pathogens.

3. Leadership and program management

Root cause analysis (RCA): For the sake of identifying areas of opportunity and reinforcing reliable design, the IP might lead OR committee members or other designated perioperative team members in a RCA of a SSI. A root cause can be defined as the "most basic causal factor or factors which, if corrected or removed, will prevent recurrence of a situation."[6(p1)] The RCA should focus primarily on systems and processes, not individual performance. When developing the RCA, The Joint Commission recommends the facility incorporate the following elements:

- "A determination of the human and other factors most directly associated with the sentinel event and the processes and systems related to its occurrence;
- analysis of the underlying systems and processes through a series of 'why' questions to determine were redesign might reduce risk;
- inquiry into all areas appropriate to the specific type of event as described in the current edition of 'Minimum Scope of Review of Root Cause Analysis;'[7]
- identification of risk points and their potential contributions to this type of event; and
- a determination of potential improvement in processes or systems that would tend to decrease the likelihood of such events in the future, or a determination, after analysis, that no such opportunities exist."[7(p3-9)]

When performing a RCA after a SSI, it is critical to compare the care provided for the procedure in question to evidence-based prevention guidelines to identify gaps or opportunities for improvement. The Society for Healthcare Epidemiology of America Compendium is a good source for SSI prevention guidelines and can be found at: **http://www.shea-online.org/PriorityTopics/CompendiumofStrategiestoPreventHAIs.aspx**.

4. Technical

Automated surveillance technology: Transitioning from paper to electronic records continues throughout the country. In tandem, infection control data mining software has become available to IP department personnel to assist in automating traditionally manual functions, including generation of lists of patients in isolation, patients with positive cultures, and potential blood culture contaminants. In addition, some hospitals are developing automated infection detection tools to further assist IP personnel. Infection prevention personnel can use this technology to make infection rate reports more readily available to high-risk departments, such as the OR. In some locations, IP personnel share access to these tools so that perioperative personnel can create their own SSI reports.

Fostering collaboration between the IP and perioperative personnel

Collaboration between IPs and perioperative personnel is critical to help ensure optimal patient safety. Individuals in each area of expertise possess critical knowledge that when combined, can lead to a more robust patient safety program. The following are examples of actions that can foster collaboration between IPs and perioperative personnel:

- Quarterly in-person meetings between the IP and the perioperative services nurse manager to discuss potential improvement opportunities focused on SSI prevention.
- Routine sharing of SSI rate reports by the IP with the perioperative manager and chief of surgery for posting in the department to trigger the Hawthorne effect. The Hawthorne effect (i.e., the observer effect) refers to a phenomenon whereby workers improve or modify an aspect of their behavior in response to simply being observed. The Hawthorne effect study suggested that the novelty of having research conducted and the increased attention from such research and observation could lead to temporary increases in productivity.[8,9]
- OR department visits by the IP accompanied by the OR manager or designee. This can be directed using a checklist to standardize the visits with a focus on environmental issues and clinical practice affecting infection risk, such as cleanliness, adherence to personal protective equipment policies in semi-restricted and restricted areas, sufficient hand hygiene and surgical scrub dispensers and products, and traffic policies (e.g., doors to ORs remaining closed during procedures).

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This visit can serve many purposes: informing and familiarizing the IP with the complex perioperative environment, relationship-building, opening a dialogue between the IP and perioperative personnel, and providing answers to questions regarding infection prevention issues.

- Regular procedure observation by the IP with permission of the perioperative nurse manager and the surgeon, with a focus on procedure types that present high risk for infection or are associated with an existing high rate of infection. Observation should be guided using a checklist including items described earlier.
- On the day of the procedure observation, the IP should arrive in the OR in time to observe the room setup and opening. This affords the IP the opportunity to understand the complexity of the instrumentation and to begin a dialogue with the scrub person regarding instrument decontamination, sterilization, transport, and any possible issues. It also affords the IP the opportunity to find a place to observe the procedure that does not interfere with the perioperative team.
- After OR observations, the IP should meet with the perioperative nurse manager for a debriefing, which should include the sharing of best practices and opportunity areas noted during the observation.

Conclusion

The IP belongs in complex environments, such as the OR, because that is where the greatest patient infection risk resides. A strong partnership between perioperative and IP personnel can help optimize SSI prevention efforts. While perioperative team members and surgeons are the experts regarding the OR environment, surgical procedures, and all associated equipment and instrumentation, the IP can contribute his or her expertise regarding SSI prevention strategies. Sharing knowledge between IPs and perioperative personnel supports the best patient outcomes.

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