Cleaning audits lead to better environmental hygiene

Environmental hygiene is an ongoing concern in all hospitals because of its role in patient safety and infection control. Standardized processes can greatly improve the efficacy of OR cleaning, but continuous monitoring is needed to ensure compliance with those steps.

Inconsistent cleaning processes, staff turnover, new equipment, and unclear expectations are some of the hurdles that get in the way of thorough OR cleaning. Pathogens are frequently transported between hard surfaces and hands to patients where they can cause infections in both patient rooms and the OR. To help reduce the risk of infections, Sacred Heart Medical Center RiverBend in Springfield, Oregon, began measuring and improving OR cleaning levels in 2009. Sacred Heart is part of the PeaceHealth system, which operates 7 hospitals in Alaska, Washington, and Oregon and has a strong commitment to patient quality and safety. The hospital’s 28 ORs are used for the following types of surgery: general, comprehensive gastroenterology, orthopedic, oncology, gynecologic, urologic, thoracic, otolaryngology, cardiovascular, neurosurgical, bariatric, and pediatric.

Our goal was to ensure that 90% of all high-touch objects (HTOs) are cleaned. And while that goal has not quite been reached, it is in sight.

Process
Our broad goals were to apply objective cleaning criteria, reach an agreed-upon percentage of cleanliness, and sustain ongoing measurements for continued improvement. Infection Prevention (IP) and Environmental Services (EVS) staff at Sacred Heart had previously implemented an invisible fluorescent target method (DAZO® Ecolab, St Paul, Minnesota) to confidentially mark and audit whether HTOs in our patient rooms were cleaned. We sought to apply the same auditing tool in our ORs to fully understand current processes for end-of-day cleaning and identify areas for improvement.

HTOs were confidentially marked early in the morning prior to the first surgical patient, and those surfaces were evaluated using a handheld black light 24 to 48 hours later. Target removal was considered evidence of disinfection.

At baseline, our OR audits showed 66% (N=524) of HTOs were cleaned at the end.
of the day. The IP department set out to describe the current process and prioritize areas of focus for education. To better understand the current process, data was analyzed several different ways, including:

- **Zone analysis.** The HTOs audited within the OR were divided into 3 zones based on their distance away from the operating table (inner, middle, and outer zones). The inner zone HTO surfaces consisted of the main lights, Bovie, blood pressure cuffs, and pulse oximeter; the middle zone surfaces included the large side tables, small side tables, and the anesthesia machine, cart, telephone, and keyboard; and the outer zone included the light switch, OR door, hall door, cabinet door, and x-ray monitor. Areas closest to the patient had the highest percentage of total HTOs cleaned (70%), and areas along the back wall had the lowest percentage (58%).

- **OR suite analysis.** The OR suites were also broken down by procedure into 3 categories: orthopedic, neurosurgical, and cardiovascular surgical suites. The range for total HTOs cleaned was comparable between the suites, with 70% of total HTOs cleaned in orthopedic suites, 65% of total HTOs in neurosurgical suites, and 58% of total HTOs in cardiovascular suites.

- **By each item.** We displayed the data using a Pareto chart to identify which HTOs were consistently being missed during cleaning procedures and where our educational efforts should be directed to make the greatest impact. X-ray monitors, cabinet door handles, computer keyboards, and the main overhead lights were identified as areas in greatest need of improvement.

The outcomes of the baseline evaluation were shared with managers from the OR and EVS, and we subsequently created an action plan and educational process to achieve a focused goal of reaching and maintaining cleaning at 90% or higher. Audits (listed below) would continue to be performed periodically after sharing the outcomes of the baseline audits with staff who clean the OR.

- **Posteducational audit.** After outcomes were shared with staff, an audit would be done 1 week later to assess the effectiveness of the education process.

- **Retention assessment audit.** Within 1 to 2 months of the posteducational audit, an audit would be done to assess if the information was retained and had effectively influenced the cleaning process.

- **Ongoing assessment audits.** Periodic environmental audits would be done to assess ongoing process change and to identify areas for improvement.

### Maintaining results

As the program got underway, our cleaning audits revealed a substantial increase in total HTOs cleaned during the second audit, which followed the baseline audit conducted in June 2009. A total of 77% of all items audited were cleaned in comparison with the baseline outcomes of 66%. However, a few months later, the third audit was conducted and revealed changes in process had not been sustained; the 65% of HTOs cleaned was essentially equal to the baseline results.

OR and EVS managers met to identify gaps in the cleaning process and deter-
mined lack of ownership for cleaning specific equipment was a major barrier to success. As a result, all areas and equipment in the OR were listed and designated to either OR or EVS staff. The OR staff further delineated cleaning protocols between surgical technical assistants (STAs) and anesthesia, with anesthesia taking responsibility for cleaning their own equipment.

Audits were repeated every 4 to 6 months through January 2012. After the fifth audit, there was evidence of continuous improvement; however, the results had not yet reached the goal of 90% of all HTOs cleaned.

IP was asked to identify any patterns in the data that might help identify where interventions could improve the process. The items that EVS and STAs were responsible for cleaning showed similar outcomes over time and were condensed into a single measure per audit. The percentage of items the anesthesia group agreed to clean was consistently below all the percentages of all other HTOs cleaned in the OR. The anesthesia manager addressed the outcomes with staff, emphasizing the patient safety issues associated with equipment disinfection protocols. Over the next 2 audits, done in April 2011 and January 2012, the percentage of HTOs cleaned in the OR remained above 80%. In January 2013, the percentage reached 82%.

Since 2009, OR cleaning at Sacred Heart has steadily improved, but continued audits will monitor the effects of new interventions as we get closer to achieving our goal of 90%. While our OR process objectively measures end-of-day cleaning, between-case cleaning processes are also important and are currently being investigated as well.

Hospitals looking for ways to improve cleaning practices and thoroughness of cleaning need to take a comprehensive approach that includes objective evaluation and measurement to track progress.

Dianna Appelgate, MS, MPH, CIC, CPHQ, is an epidemiologist and infection preventionist; Bobbi Faust, MN, RN, CNOR, is director of Quality/Safety/Standards for Surgical Services; and Jason Dunson, CPhT, CEH, is supervisor for Environmental Services at PeaceHealth Sacred Heart Medical Center RiverBend, Springfield, Oregon.