# OR Manager

## Inside OR Manager

### Ambulatory Surgery Centers

## Infection prevention

# Upping the game for OR cleaning with monitoring and partnerships

All ORs have protocols for cleaning between cases and at the end of the day's schedule. But constant vigilance is needed to make sure cleaning is thorough and carried out consistently.

Though an OR may look clean, studies have shown there's room for improvement.

For example, only 25% of OR surfaces targeted in a study of 71 ORs in 6 hospitals had been cleaned thoroughly, Jefferson and colleagues reported in the AORN Journal.

In a pilot study in 5 ORs, researchers cultured overhead lights and found lights in 3 of the 5 ORs were positive for growth of bacteria such as *Staphylococcus*, *Streptococcus*, and *Neisseria*.

The stakes of spotty cleaning are high. Evidence indicates that environmental contamination plays a role in the spread of methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* (VRE), and *Clostridium difficile*, among others.

There's also evidence that environmental bacteria, particularly coagulase-negative *Staphylococcus*, is the most common cause of deep organ space surgical site infections (SSIs) related to implants.

## OR performance

# Benchmarking labor productivity: How is your OR being compared?

Productivity monitoring and management are near the top of the priority list for every perioperative nursing director. With 50% to 80% of a hospital's costs in labor, staffing dollars are a big target for cost management.

Some experts say hospitals and health systems will face budget cuts of 20% to 25% over the next 5 years as the nation tries to cope with health care costs and an aging population.

With cuts that steep, labor isn't immune.

As the hospital's greatest cost and revenue center, the OR won't escape scrutiny.

With about 60% to 65% of a hospital's profitability coming from surgery, "a well-run program can make or break perioperative services and your hospital's profitability," says Patrick Voight, BSN, MSA, RN, CNOR, of Deloitte Consulting.

Perioperative directors typically

## Editorial

This month's article on preop testing research had a familiar ring (page 20). Researchers at the University of Texas Medical Branch (UTMB) in Galveston have found much more testing is being done than seems to be needed. They're documenting the patterns.

Seems not much has changed.

These new studies join other reports dating back more than 25 years.

JAMA published a report titled "The usefulness of preoperative laboratory screening" in 1985.

Michael Roizen, MD, an anesthesiologist, was advocating for more rational use of preop testing in the late 1980s.

He's now better known for his "RealAge" test and best sellers like You: The Owner's Manual. Dr Roizen often teams up with the even better known TV personality Mehmet Oz, MD, who got his start as a cardiothoracic surgeon.

### What's new

What's new about the UTMB research is how preop lab testing plays out in whole populations. The researchers are finding interesting patterns. In their home state of Texas, for example, patients are far more likely to have a preop chest x-ray in some communities than in others, with the rates swinging from 10% to 90%.

The patterns echo the big geographic variations seen in elective surgery as documented by the Dartmouth Atlas Project (www. dartmouthatlas.org).

Those findings are raising questions about why spinal surgery or mastectomies are so much more common in some places than in others. And why are Medicare costs nearly 3 times higher in some locales than in others?

With Medicare gobbling up more and more of the federal

> ## "These questions demand answers."

budget, questions like these demand answers.

A single test like a CBC may not cost much, but over time, tests add up. The nation's bill for preop testing is pegged at $3 billion to $18 billion a year.

You know how much time your staff and physicians spend chasing down and reviewing preop testing results—many of which may not be needed in the first place.

It's interesting to hear what physicians think of all of this.

Surgeons order most of the tests, worrying anesthesia providers will cancel their cases if they don't, according to an article in the Annals of Surgery (2012; 256:518-528).

"I think it's a communication problem," says Taylor Riall, MD, PhD, of UTMB.

How to get past that?

For right now, the best solution seems to be for the physicians and staff in your hospital or health system to forge a consensus and write guidelines to match.

Dr Riall says she thinks studies are needed to compare patient outcomes for centers that perform a lot of testing with those that don't. She also thinks surgeons and anesthesiologists need to come together at the national level to develop guidelines.

It's time to set a path toward resolving a situation that causes unnecessary inconvenience for patients, more work for preop departments, and a waste of health care resources. ❖

*—Pat Patterson*

# Simulation study supports use of crisis checklists

**S**urgical checklists have gained traction in recent years as studies have shown that they improve patient safety.

Using surgical crisis checklists might be the next logical step, judging by a recent simulation study. OR staff missed just 6% of life-saving steps when using crisis checklists, but when staff relied on memory alone, 23% of life-saving steps were missed.

A total of 17 OR teams from 2 community hospitals and 1 academic medical center in the Boston area participated in the study, which was done in the simulation lab at Brigham and Women's Hospital in Boston. Each team had anesthesia staff, OR nurses, surgical technologists, and mock surgeons (because few volunteer surgeons were available for the study).

The teams spent 6 hours in a high-fidelity simulated OR where they handled crises such as air embolism, anaphylaxis, asystolic cardiac arrest, and hemorrhage. For half of the scenarios, they were allowed to use crisis checklists; for

> " **Agreement on content is key.** "
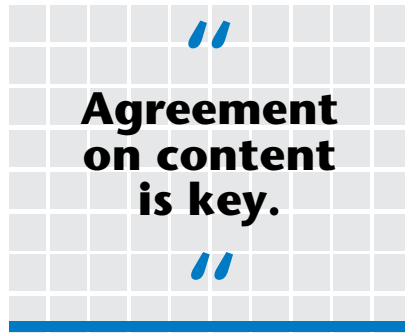
the other half, they worked from memory.

Failure to adhere to life-saving processes of care for each crisis was the primary outcome. Checklist use reduced the failure rate by nearly 75%.

"The basic surgical checklist introduced 4 years ago still has not been widely adopted because it's hard to get staff to agree on how they want to do it," says Atul A. Gawande, MD, FACS, a general surgeon at Brigham and one of the study's authors.

"To have a verbal plan—a scripted check-in/check-out—takes agreement, and that has

been hampered by skepticism, especially among surgeons. The fundamental value in our system is autonomy; people value independence, whereas this system demands humility, teamwork, and discipline."

But the results of this study argue for making the effort. Fully 97% of the study participants said that if an emergency occurred while they were having surgery, they would want the OR team to use a crisis checklist. Participants also said the crisis checklist was easy to use, and it made them feel better prepared.

## Guides for staff

At Brigham, booklets containing crisis checklists have been placed on the anesthesia cart and on the wall near the circulating nurse to guide staff step by step through potential intraoperative emergencies.

Whole-team simulation training and crisis management have been introduced at Brigham and at Harvard, and surveys will be done to see if these checklists have been useful in disasters.

"The key part is getting people together and getting them to agree on the content of the booklets," says Dr Gawande. He noted that booklets from a pilot project 2 years ago were updated to reflect current clinical guidelines and suggestions from staff at Brigham.

For successful checklist adoption, it's important to train teams individually, especially the anesthesia and nursing staffs, he advises. Details about Brigham's experience and guidelines for implementation at other institutions are available at www.projectcheck. org/crisis. ❖

### Reference

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# OR BUSINESS MANAGER WORKSHOP

**April 7-9, 2013**
**Marriott City Center**
**Denver, Colorado**



This intensive, interactive workshop is an opportunity for OR business managers to increase their knowledge of OR processes, to develop critical skills to drive effective business practices for surgical services, and to network with colleagues.

The workshop will be led by speakers experienced in managing the business of perioperative services, including an expert in the health care revenue cycle specific to perioperative services, and an OR clinician.

## FOCUS OF WORKSHOP

The focus is on developing analytical/critical thinking skills as well as on understanding cost components and overall financial management of the OR. Attendees will have the opportunity to work on projects during small-group breakout sessions to problem-solve and develop strategic planning skills.

Some of the topics to be covered are:
• OR charging methodology
• Vendor management
• Management of the revenue cycle
• Data management for decision making
• Operational efficiencies
• Value analysis process
• Role of the business manager

## TARGET AUDIENCE

Participants will include business managers involved in the business decisions that drive the OR's economic, quality, technical, and program development.

Limited to 75 participants, the two-day workshop will open with a welcoming reception on Sunday evening and end Tuesday afternoon.

## WORKSHOP FORMAT

The workshop will open with a welcoming reception and introduction of speakers on Sunday, April 7. This will provide an opportunity to register and meet other attendees. A full-day session is planned for Monday, April 8, and a half-day session for Tuesday, April 9.

Registration information will be available soon.

## CONTACT

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Registration is **NOW OPEN:**
http://store.ormanager.com/by-subject-area/or-business/or-business-management-workshop.html

# OR cleaning

The evidence is reviewed in the Jefferson et al article in the AORN Journal.

Visually checking surfaces for cleanliness is no longer enough. The Centers for Disease Control and Prevention (CDC) advises that cleaning be validated. The CDC's Guidelines for Environmental Infection Control in Healthcare Facilities recommend:

• enhanced cleaning for high-touch surfaces that are likely to be contaminated

• monitoring the staff's compliance with cleaning protocols.

A CDC web page, Options for Environmental Cleaning, offers advice and tools for evaluating cleaning of high-touch surfaces. Tools include a checklist for monitoring cleaning on patient units and guidance for selecting an objective monitoring method.

## Improving cleaning

ORs are taking a focused look at cleaning protocols in partnership with infection prevention and environmental services (EVS). Many are adopting objective methods to monitor cleanliness with feedback and reeducation for the staff. A few are considering whole-room disinfection with new technologies (related article, p 12).

At the same time, managers worry about how they will sustain cleaning efforts if budget pressures force staffing cutbacks.

## Evidence on OR cleaning

There's new evidence that systematic OR cleaning supported by a monitoring system can make a difference in removing gram-negative organisms.

L. Silvia Munoz-Price, MD, and colleagues evaluated clean-

> **"More time doesn't mean better cleaning."**

ing at a 1,500-bed hospital with 43 ORs. In 4 cycles over 5 months, target surfaces were marked with a clear fluorescent marking gel (DAZO, Ecolab) and evaluated 24 hours later with a UV light. The UV light reveals how well the gel is removed as an indicator for the thoroughness of cleaning. The surfaces were also cultured for bacteria.

With feedback and reeducation of the staff, removal of the dye marks improved from 47% to 82% over 5 months. The most striking improvement was for anesthesia equipment, where dye removal rose from 25% to 77%.

Overall, culture results did not change: 17% of surfaces had pathogenic organisms at baseline compared to 12.5% at follow-up. But surfaces with gram-negative organisms did decline from 11% to 2%.

The authors conclude that feedback to the staff using the cultures and dye marking was successful in decreasing surface contamination from gram-negative organisms with potential to transmit infection.

Two main interventions the hospital adopted were:

• Anesthesia technologists are now responsible for cleaning the anesthesia machine and equipment between cases.

## Resources

**Association for the Healthcare Environment**
*From Top to Bottom: Cleaning Operating and Procedure Rooms.*

Video/DVD demonstrates and explains cleaning protocols for the OR and other procedure areas.

Part of 3-DVD series, From Top to Bottom, for environmental services, based on AHE's Practice Guidance for Environmental Cleaning. Available in English and Spanish. Order from www.envisioninc.net
*—www.ahe.org*

**Association for Professionals in Infection Control and Epidemiology, Association for the Healthcare Environment**
The associations are partnering in a joint educational campaign titled "Clean Spaces, Healthy Patients: Leaders in Infection Prevention and Environmental Services Working Together for Better Patient Outcomes." The campaign provides educational resources, training materials, and other solutions to assist in combating the spread of healthcare-associated infections.
*—http://cleanspaces.site.apic.org/*

**Centers for Disease Control and Prevention**
Options for Evaluating Environmental Cleaning.

Alice Guh, MD, MPH, and Philip Carling, MD, authors. Includes checklist for monitoring terminal cleaning and environmental cleaning evaluation worksheet.
*—www.cdc.gov/HAI/toolkits/Evaluating-Environmental-Cleaning.html*

• The cleaning product was changed from 17.2% isopropanolol (CaviWipes, Metrex) to 1:10 sodium hypochlorite (Dispatch, Clorox).

Cleaning policies, which were consistent with AORN-recommended practices, were not changed.

In the pilot study on cleaning of OR lights, the authors think cross-contamination could have played a role in the results, possibly when lights were cleaned with the same wipe used on other surfaces, and soiled gloves were worn by personnel. They propose developing guidelines to specify that clean gloves be donned and a new wipe used when cleaning overhead lights.

### More time doesn't equal better cleaning

Interestingly, the time spent cleaning a room doesn't necessarily equate with better results. In a study on a critical care unit, no correlation was found between how thoroughly high-touch surfaces were cleaned and how much time cleaning took. Although a few rooms were cleaned well within 30 minutes, considered the industry benchmark, many that took longer had below-average cleaning.

"Our study lends support to and may explain earlier studies that have shown that improved cleaning performance can be achieved without substantial additional cost," say the authors in the January 2013 Infection Control and Hospital Epidemiology.

### Collaboration for cleaning

A sound cleaning program calls for a partnership among perioperative services, infection preven-

**Environmental services departments' responsibility for OR cleaning**
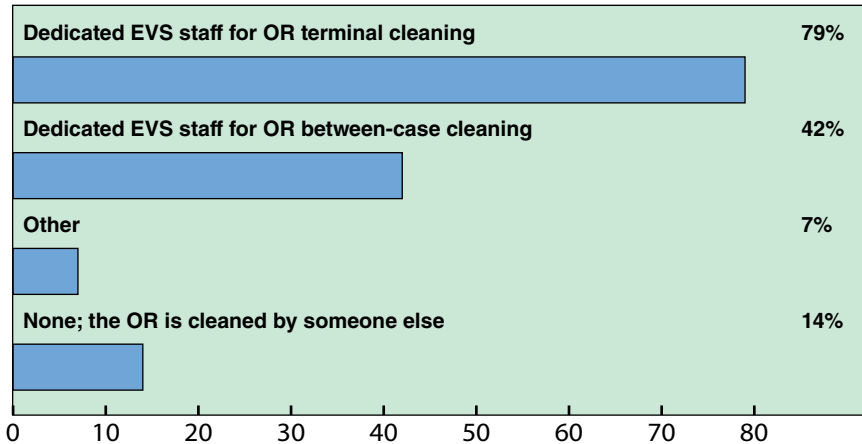


*Source: Survey by Association for the Healthcare Environment, 2012. Reprinted with permission.*

tionists, and the EVS department.

Because EVS staff frequently clean ORs, their partnership is critical. In all, 79% of EVS departments had dedicated staff for OR terminal cleaning, and 42% had dedicated staff for between-case cleaning, according to a 2012 survey by the Association for the Healthcare Environment (AHE) (chart).

Regular communication is needed. Cleaning policies should be written and clear, advises Patti Costello, AHE's executive director. "We tell our members that if you're involved in OR cleaning, you need to make absolutely certain that you know who's cleaning which types of equipment and the high-touch areas so the staff is properly trained."

As an example of a good approach, she refers to a zone system for OR cleaning developed by St Luke's Boise Medical Center in Idaho (related article).

"I think the zone system addresses a number of issues," she says. Zones are clearly defined, and a staff member takes responsibility for each zone so there's no confusion about who will clean which areas.

### Improving cleaning compliance

Cleaning compliance for ORs in the 15 medical centers in Kaiser Permanente's Southern California Region improved rapidly after the ORs adopted a cleaning and validation program that already had been successful on patient units. The program includes:
• identifying high-touch surfaces with high risk for pathogen transmission
• standardizing policies and procedures
• implementing a cleaning validation process using fluorescent dye marking.

Cleaning on the patient units improved from 20% at baseline to 98% to 99% within a few months of adopting the program, and the results have lasted.

In 2010, Enid Eck, MPH, RN, Kaiser's regional director for infection prevention and control, partnered with Marie Paulson, BSN, MS, RN, CNOR, regional director for perioperative services, on the OR cleaning project.

Baseline measurements for the ORs were higher than on the units, at 40% to 80%, but there

was still room for improvement.

Within a few months after the cleaning program was introduced, results improved to over 80% at nearly all hospitals, with most well above 90%, Eck says.

The cleaning validation process is as follows:

• At least 20 ORs are validated each month at each facility, depending on its size, using the dye-marking system. EVS staff do not know which rooms will be marked.

• After the last case of the day, the specified surfaces are marked, and the rooms are cleaned.

• In the morning, before surgery starts, a manager uses the UV light to check the cleaned surfaces. Results are documented.

• Data is reviewed and trended monthly to see if surfaces are being missed. If so, further education is conducted.

### Keys to improvement

Eck points to some key factors that helped improve and sustain OR cleaning:

• a strong labor-management partnership with the unions

• sustained education and feedback for EVS personnel

• an emphasis on the EVS staff's importance to safe patient care.

In meeting with labor leaders, Eck shared the baseline findings on cleaning and the potential risk to patients.

"We framed it as, 'We assume the staff intends to do the right thing, but perhaps they have not been thoroughly educated,'" she says. "Our intent was to make sure the staff understood what needed to be done and how to do it."

Especially important, she stresses, is to inspire a vision in EVS staff that "what EVS does is as important as what the clini-cians do" in keeping patients safe from infection. In one example, she and the EVS managers encourage the staff to think about how clean they would want the OR to be if a family member were having surgery.

### Facing budget challenges

Budget pressures are a reality in health care. Managers need to advocate for the resources necessary to ensure thorough cleaning.

First, Costello advises, the OR director, EVS manager, and infection preventionist need to agree on a standard for OR cleaning that meets regulatory standards and is aimed at preventing SSIs. The standard should be in writing and communicated to the chief nursing officer and senior administration as well as to the staff.

If an order comes to cut the budget, she suggests, the same group can sit down with administrators and say, "This is the standard we have agreed upon."

They can suggest how this standard would be jeopardized if staffing were reduced; for example, cleaning might be less thorough or turnover times between cases might be longer.

Eck got buy-in from the senior administrator responsible for EVS when starting the cleaning validation project. She shared the baseline findings showing that even though rooms looked clean, high-touch surfaces still could harbor pathogens.

In addition, she presented data on surface transmission of health care-associated infections (HAIs) and their costs.

The administration realized what improving on or eliminating the risk of HAI would do for the bottom line, both in quality and cost, she says.

"Most SSIs have the potential to be seeded in the OR, particularly deep organ space infections, such as with joint replacements."

With public reporting, potential lawsuits, and a lack of reimbursement for treating HAIs, the costs of haphazard cleaning can easily count up, she points out. ❖

*—Pat Patterson*

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# OR zone system: A fast and effective way to clean

**A** protocol using color-coded zones has yielded a more thorough, efficient cleaning process for one 17-room OR.

The OR leaders knew they had to step up cleaning as part of an effort to reduce surgical site infection (SSI) rates and to accomplish between-case cleaning more systematically.

The answer: Divide each OR into 4 zones and have each member of the cleaning team sign up to clean a zone (illustration).

Designating zones alone isn't sufficient, cautions Melissa Clapp, BSN, RN, CNOR, nurse manager for the ORs at St Luke's Boise Medical Center in Idaho.

The OR also needs a standardized process, clear expectations, and thorough training for both environmental services (EVS) and OR staff.

Though St Luke's had tried a zone system previously, without proper training, it quickly fell apart, she notes.

The zone system was revived during a project to improve turnover time. The effort was led by Clapp, the EVS director, and the clinical educator.

## Four zones

The 4 zones include:
- Red zone: Anesthesia area
- Green zone: Floor
- Blue zone: Horizontal surfaces
- Yellow zone: OR bed, lights, IV poles, patient warming device, cords, and related items.

Each room has a laminated map showing the zones with spaces for the staff to sign up.

"When you come in to clean the room, you sign up for a zone," Clapp explains. "Then you're responsible for that zone, and you clean all of those components."

The EVS staff is primarily responsible for OR cleaning. Five

"
## SSIs, turnover, and cleaning times are down.
"

to six EVS staff are available on weekdays from 7 am to 3 pm.

If EVS staff is not available for a case turnover, they stage the room with a mop and other supplies. That indicates to the OR staff that they will need to do the cleaning.

At the end of the day, the person who performs terminal cleaning of an OR signs a wall chart with the date and time.

"In the morning, we can reference the wall chart to see who performed the cleaning and what time and date cleaning was completed," she says. "If we see anything has been missed, we know who to talk to."

## Advice on implementation

Clapp estimates that it took about 6 months for the process to be hard wired.

She stresses the importance of having clear, standardized policies and procedures for all staff. In addition, translating all training material to overcome language barriers is especially important.

"The biggest barrier we have had is language," she says. "Before, we just brought in our EVS staff and had one interpreter convey the instructions, but there was no return demonstration." That wasn't effective.

Here's her advice for ORs that want to introduce a zone system:

- Plan for education and training. Spend time upfront developing tools and training correctly.
- Have a checklist for the correct process.
- Translate all training materials into the appropriate languages.
- Conduct rounds, audit, and be visible to sustain the effort.

## Validation of cleaning

For validation of cleaning, St Luke's uses a fluorescent marking gel. The gel is applied to high-touch surfaces where cleaning is to be validated. After cleaning, a black light is shined on the surface to determine if the gel has been removed.

The audits are conducted by the EVS department or members of the hospital's Project Zero infection prevention team.

If gaps are found, education is reinforced.

Cleaning is most likely to be effective if the EVS staff feel like a part of the team. "One reason the zone system works is because we have really engaged the EVS staff," Clapp says.

"We have welcomed them, made them feel important, and had luncheons so they know the value of the work they're doing. I think they are proud of the work they do."

With a more systematic and thorough cleaning protocol as well as Project Zero's other efforts, SSI rates have come down, as have turnover times and cleaning times.

"The zone system makes cleaning a more efficient process," Clapp says. "We want to be thorough, touch all surfaces, and do that in a short period of time." ❖

*—Pat Patterson*

# Infection prevention
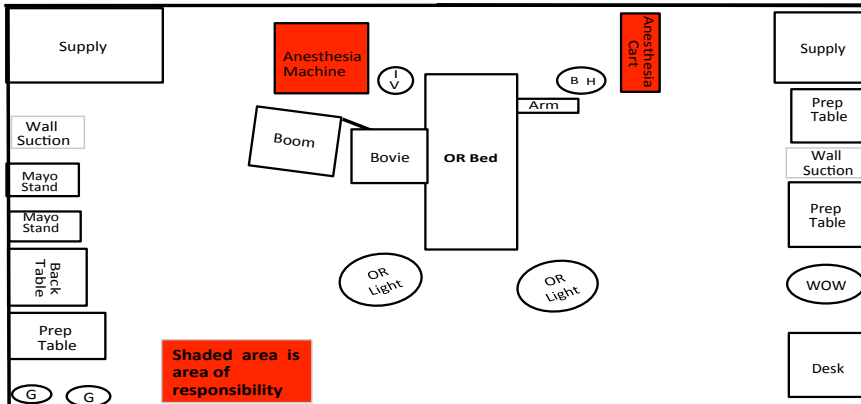


**Zone One**
**Anesthesia**
**Cleaned by:**

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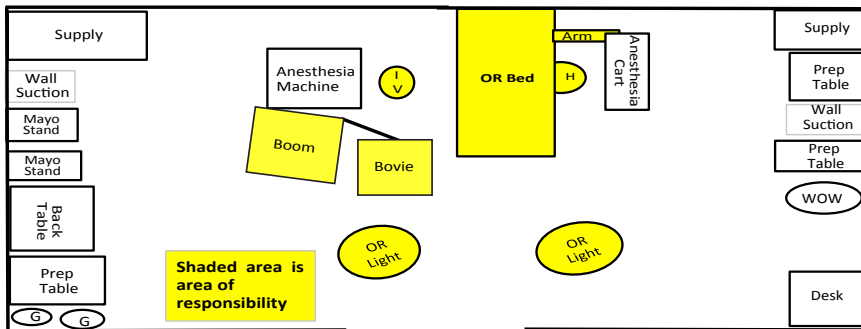
**Zone Two**
**Bed**
**Cleaned by:**

_____
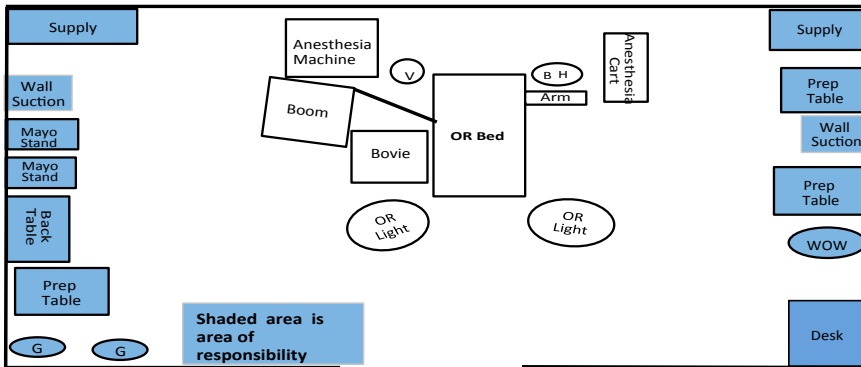
**Zone Three**
**Wiping**
**Cleaned by:**

_____
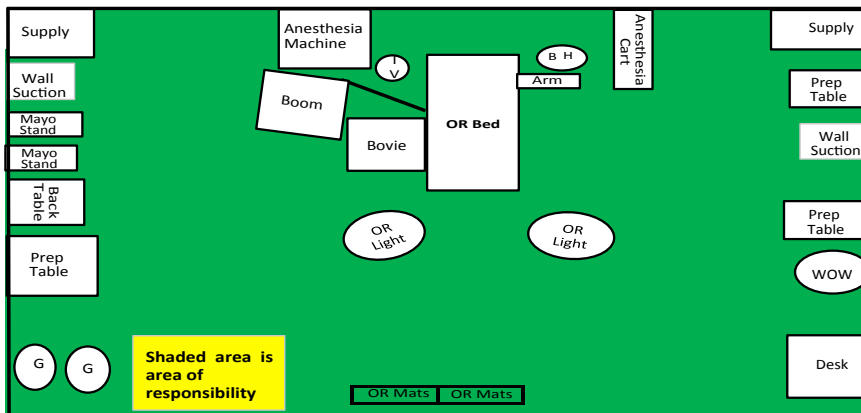
**Zone Four**
**Mopping/Mats**
**Cleaned by:**

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DATE: _____

FINAL CLEANING BY:

_____

DATE: _____ TIME: _____

Supply · Anesthesia Machine · Anesthesia Cart · Supply · Wall Suction · Mayo Stand · Back Table · Prep Table · Boom · Bovie · OR Bed · Arm · OR Light · WOW · Desk · G · Shaded area is area of responsibility

*WOW = Workstation on wheels.*

*Source: St Luke's Boise Medical Center, Boise, Idaho. Reprinted with permission.*

# Could technology lend a hand in cleaning of ORs?

**M**anual cleaning is performed by humans, and thus will always be imperfect. Could technology lend a hand?

Some hospitals and a few ORs are adopting an extra disinfection step—employing robot-like machines that can disinfect an entire room.

The machines are meant to augment—not replace—manual cleaning.

These technologies have some compelling data, but "they're not the magic bullet," cautions Patti Costello, director of the Association for the Healthcare Environment.

OR Manager talked with researchers from 2 companies that make these no-touch systems about their application in the OR. The systems use hydrogen peroxide vapor (HPV) (Bioquell, UK) and pulse-xenon ultraviolet (UV) light (Xenex, San Antonio, Texas).

## OR applications

Jon Otter, PhD, scientific director for Bioquell and lead author of a new review of automated whole-room disinfection systems in the Journal of Hospital Infection, lists 4 situations in which this technology might be applied in the OR:

- after surgery in a patient infected with a particularly virulent organism, for example, a multidrug-resistant gram-negative organism such as *Acinetobacter baumannii*
- as part of a program to prevent infection transmission
- in commissioning an OR after construction or another event that has taken the OR out of service
- when there is an infection outbreak with a particular pathogen associated with a specific operating room.

> **" They're not the magic bullet. "**

## Adding UV to terminal cleaning

Texas Health Southwest in Fort Worth elected to add the pulse-xenon system to its cleaning protocol for its 8 ORs in January 2012.

"We were looking at ways to decrease our surgical site infection rates, which appeared to be multifactorial," says the infection preventionist, Katherine Rhodes, BSN, RN, CIC, COHN-S, CHSP.

The pulse-xenon system is deployed in each OR daily at the end of manual terminal cleaning as well as after construction and certain dirty-infected (Class IV) cases.

"It's almost impossible, even with good manual cleaning, to hit every surface," she says. "There is so much complex equipment in an OR. We knew there were areas that would be missed."

The pulse-xenon process takes about 15 minutes per OR. The company analyzes each room to determine how much time and how many positions are needed for the UV light to strike all targeted surfaces. The machine is operated by the same staff who perform the manual cleaning.

Culturing during product evaluation showed that adding the pulse-xenon process did reduce the numbers of viable organisms. After a year of use, Rhodes says she's awaiting updated SSI data, which will be the real test.

Here are brief descriptions of the HPV and pulse-xenon systems provided by the companies' researchers.

## What are the technologies?
### HPV

HPV systems deliver a heat-generated hydrogen peroxide vapor through a high-velocity air stream to distribute the vapor evenly through an enclosed area. The Bioquell system has a generator, monitoring modules, and remote control pedestal for operating the system in the enclosed area. Steris has a similar system using vaporized hydrogen peroxide (VHP). Both systems are Environmental Protection Agency-registered sterilants.

### Pulse-xenon UV

The Xenex system works by pulsing xenon, an inert gas, twice a second in a xenon UV flash lamp. This produces ultraviolet C radiation, which penetrates cell walls of microorganisms, fusing their DNA so they cannot reproduce or mutate, effectively killing them on surfaces.

## What is the clinical evidence?
### HPV

In patient rooms, HPV disinfection has been shown to significantly reduce the risk of transmitting a multidrug-resistant organism (MDRO) from a prior room occupant.

In a new study from Johns Hopkins Hospital published in Clinical Infectious Diseases, patients admitted to patient rooms decontaminated with HPV were significantly less likely to acquire MDROs than control patients. Over 1,300 rooms were decontaminated using HPV during the study with no health and safety

problems reported. Bioquell provided the HPV generators and supplies.

### Pulse-xenon UV

One study, conducted at MD Anderson Cancer Center and published in Infection Control and Hospital Epidemiology, compared the pulse-xenon system with standard terminal cleaning of patient rooms. The pulse-xenon system showed a significant reduction in the microbial load and eliminated vancomycin-resistant *Enterococcus* on sampled surfaces using a 12-minute cycle in multiple positions.

Two abstracts on OR disinfection have been submitted for the 2013 meeting of the Association for Professionals in Infection Control and Epidemiology (APIC), notes Mark Stibich, PhD, MHS, chief scientific officer for Xenex:

- One study, comparing a 3-hour terminal cleaning with a 38-minute quick clean followed by 2 5-minute positions of the pulse-xenon unit, found contamination on sampled surfaces was reduced by about half.
- The second study evaluated contamination when the pulse-xenon device was used nightly versus standard cleaning and also found contamination was reduced by about half.

### How is the system operated?
#### HPV

The Bioquell HPV system has 2 units, a generator and an aeration unit, for a single room. Door and air vents must be sealed. Monitoring is conducted to ensure there is no leakage of vapor and to verify the concentration is below recommended exposure limits before patients or personnel reenter the room.

> ❝
> ## How long does the process take?
> ❞

There is a service option, in which the company owns and operates the equipment, or a purchase option, in which the hospital owns the equipment and the company provides training for the staff.

### Pulse-xenon UV

The Xenex system is in a portable 3-foot-tall unit with a pulsed xenon flash lamp. There are also a UV feedback sensor, a control panel, and a door sensor.

The company recommends how the machine needs to be positioned, trains the staff to operate the device, and then validates the protocol. Stibich says that during the 5-minute cycle, the high-intensity UV light reflects throughout the room, "effectively saturating the room with germicidal light."

### How long does the process take?
#### HPV

Depending on an OR's size and the air-handling configuration, the HPV process would take up to 4 hours, Otter says. For a single patient room, the reported cycle time is 1.5 to 2.5 hours.

### Pulse-xenon UV

Two studies have shown decontamination of a 400-square foot OR would require 2 5-minute positions of the system, says Stibich.

### What is the cost?

The cost of the Bioquell HPV system is about $50,000 plus consumables. The Xenex bundled cost, including training, service, and replacement bulbs, is about $82,000. ❖

*—Pat Patterson*

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## Large spinal surgery study refutes 'July effect'

The influx of new residents and fellows in July at teaching hospitals has little effect on outcomes, according to a study of 1 million spinal surgeries.

Teaching hospitals had minimally higher rates of postoperative infections and patients discharged to long-term facilities in July than did nonteaching facilities, but the rates were not high enough to establish a "July effect," the authors say.

In-hospital deaths and postoperative complications did not differ by month. ❖

*—McDonald J, Clarke M J, Helm G A. J Neurosurg: Spine. Published online January 29, 2013.*

## Labor productivity

receive a regular labor productivity report showing how their FTEs compare with a target or a benchmark. Understanding these reports is essential to managing and justifying the FTE count.

### Managing to a benchmark

Managers and directors often are expected to meet a labor productivity benchmark. The hospital may subscribe to an outside benchmarking service or be part of a network that benchmarks internally.

Regardless of the source, it's important to realize what benchmarking can and can't do, Voight advises.

Benchmarking can give you a sense of how your OR compares to a peer group. But benchmarking doesn't show exactly where you might have problems if you are off the target.

For example, the report might show that your staffing for a reporting period is 5 to 10 FTEs over the benchmark. But "it doesn't tell you which positions those are," he says. That requires an internal analysis to learn why your labor numbers are higher and a performance improvement project to identify and address what is driving labor costs (sidebar).

### What is needed for benchmarking?

ORs often benchmark their labor productivity both internally, such as comparing their own performance month to month, and externally with a peer group.

### Key principles

A few key principles:
- Benchmarking generally focuses on worked hours rather

> **"Are you being compared appropriately?"**

than paid hours because management has more control over worked hours. Paid hours include worked hours plus paid leave, such as sick time and vacation. Typically, paid hours are 24% to 32% higher than worked hours, depending on the region of the country, Voight notes.
- In benchmarking, worked hours generally include straight time, overtime, call-back hours (usually calculated as overtime), orientation, and education.

### Unit of service

The unit of service for labor productivity in the OR typically is either worked hours/OR case or worked hours/OR minute. Voight says he prefers worked hours/OR minute adjusted to worked hours/100 OR minutes, a more workable number.

OR minutes give a more accurate picture of labor productivity than cases, he says, because they better capture the complexity of service. For example, a facility performing 5,000 orthopedic cases a year will require more labor than one performing 5,000 cataract cases.

A caveat: Be clear about which database your OR minutes are drawn from when comparing yourself to an external peer group. That could make a big difference in the productivity numbers, Voight advises.

For example, if OR minutes are drawn from the hospital's financial system, and the system rounds case time up to the nearest 15 minutes for billing purposes, the total minutes will be higher than the minutes captured by the OR information system, which documents actual minutes patients are in the room (wheels in to wheels out).

Assume a patient is in the OR for 31 minutes, for instance. The financial system may round up to 45 minutes when the actual worked time is 31 minutes. In this case, if 45 minutes is used in the unit of service (OR minutes), productivity will look better than it actually is.

### Data needed

To establish initial benchmarks for your department, you will need 1 year of data; that is, hours worked (or paid):
- payroll data including paid hours and worked hours
- unit of service by department (cases, OR minutes, visits, etc)
- the organization's financial and operational characteristics.

### External benchmarking

Elements needed for forming an external peer group:
- a defined peer group of similar departments in similar hospitals
- data for specific departmental benchmarks consistent with what the benchmarking service uses
- a department description similar to that used by the benchmarking service.

### Comparing apples to apples

To get a true picture of where you stand in benchmarking, make sure you're being compared appropriately with facilities you're measured against.

# OR performance

## What's driving your labor costs?

**Does your OR's labor productivity consistently exceed the benchmark? Check your OR against these characteristics of top-performing departments.**

### Perioperative governance

- The surgical enterprise is led by a perioperative governing body that functions like a board of directors to manage department resources.

### Preoperative preparation

- Patients are consistently cleared 48 to 72 hours before the day of surgery:
  —Patients are financially cleared.
  —Anesthesia assessment is completed.
  —Diagnostic testing results are complete and on the chart.
- Elective patients are removed from the schedule at 48 hours until all preoperative components are complete.

### Case scheduling accuracy and predictability

- Cases are scheduled using historical data from the OR information system.

### Block schedule management

- Block time is released by specialty so unused time can be filled in advance of the day of surgery.
- Roughly 80% of time is blocked and 20% is open, depending on the strategic needs of the facility. (Ambulatory surgery centers typically have a high percentage of blocked rooms because of a predictable schedule.)
- Block times are preferably 8 hours and not less than 4 hours.

### OR availability

- The number of staffed rooms matches the daily schedule.

### On-time starts

- The target is for 95% of first cases to start on time, with no grace period.

### Flipping rooms

- It is recognized that when surgeons flip rooms (that is, surgeons are assigned to 2 ORs or move from one case directly to the next), labor productivity may be affected because of potential down time in one of the rooms. The criterion for flipping should be that a surgeon's cases proceed sequentially with no down time.

### Delays and cancellations

- The OR strives to minimize delays and cancellations. Cancellations are 4% or less.

### Add-on cases

- Add-on cases are kept to 10% or less. Add-ons not only affect efficiency but also safety because patients may not be adequately prepared for surgery.

### OR utilization

- Prime-time utilization for hospital-based ORs is 75% (wheels in to wheels out) without turnover time (setup/cleanup time) or 85% with turnover time (setup/cleanup time).

### Turnover time

- Turnover time does not exceed 25 minutes on average.
- OR personnel use parallel processing for turnover activities (that is, perform some setup and cleanup activities while the patient is in the room both pre- and postprocedure).

*Source: Patrick Voight, BSN, MSA, RN, CNOR, Deloitte Consulting, and other sources.*

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You can often find out which organizations your facility is being benchmarked against through the benchmarking service to which the hospital subscribes.

Here are a few pointers for understanding how labor productivity is compared.

***Understand your peer group***

If you're being compared with a peer group, make sure those hospitals have characteristics similar to yours. These criteria are often used in determining peer groups:

- whether the hospital is part of a system
- bed size
- case mix index
- inpatient-outpatient mix
- number of discharges
- urban or rural location
- region
- teaching status.

A rule of thumb is to select about 4 criteria and strive for a peer group size of at least 20 hospitals.

"The more criteria you select, the smaller your peer group will become," Voight notes. That

might not provide sufficient data for comparison.

### Peer group criteria

Particularly useful criteria:

- **Case mix index.** This is an average DRG weight for the hospital's Medicare volume. Voight says he thinks this is an important criterion because it should reflect the complexity of the hospital's services, which may reflect the type of cases performed.
- **Bed size.** This criterion ensures the hospitals are similar in the scope of their operations.
- **Region of country.** It's helpful to compare within the same region because of geographical differences in staffing and practice patterns. Some parts of the country, such as California, are more aggressive in managing staffing than other regions.
- **Teaching status.** Teaching hospitals typically have higher staffing requirements than community hospitals because of their educational mission.

### Select the correct department description

For the comparison to be accurate, the description of your department should match what the benchmarking service uses. The description your hospital selected for your department should be reviewed and agreed upon by the OR director.

Using similar department descriptions "gets you closer to an apples-to-apples comparison," Voight says.

The description should specify what personnel are included in the OR's productivity numbers. Here's a sample description of an OR:

*Includes: All operating room ser-*

> **"**
> ## Accountability extends beyond nursing.
> **"**

*vices, intraoperative patient care, perfusion services, inpatient and/or outpatient services, and operating room support system.*

*Does not include: Postanesthesia care unit, anesthesia functions, preop holding area, and/or central sterile functions.*

### 'Normalize' your OR's data

If your department description does not match that of the benchmarking service, your data needs to be "normalized" for a more accurate comparison.

For example, environmental services personnel typically are not included in the OR department description. If your OR FTEs do include environmental services, you will want to move their hours out of the OR staffing numbers for benchmarking purposes, Voight advises.

Other personnel who may not be included in the OR description are:

- inpatient transporters
- admissions personnel
- phlebotomists in the presurgical testing area
- nurse managers.

Nurse managers may or may not be included. They are often benchmarked separately under a department description called "OR administration."

### See how you compare

Benchmarking reports generally

show how the peer group is performing at the 25th percentile, 50th percentile, and so forth. The 25th percentile represents the best performers for labor productivity in your peer group, while the 50th percentile is average, he says.

A note of caution: "Achieving the 25th percentile doesn't mean you are running a leading practice department," Voight says. "You are only comparing your OR with others in the peer group, who may not be top performers."

### Reach out to your peers

Once the peer group is selected and the FTE data has been normalized, you still may find you are over the benchmark.

In addition to conducting an internal analysis, you may want to contact high-performing peer group members to discuss how they are meeting the target. Your finance department should be able to provide a list of hospitals in your peer group. Then you can reach out and compare notes.

### Who's accountable?

Labor productivity is one measure of an OR's cost-effectiveness, but it can't be viewed in isolation. The worked hours/unit of service are directly affected by the surgical schedule and how well it is managed.

An OR with big gaps between cases because of unused block time and frequent elective add-ons during the day will not use staff as efficiently as an OR with a predictable schedule and a minimum of gaps, delays, and add-ons.

An efficiently managed surgical schedule requires interdisciplinary leadership.

"If you're expected to manage labor productivity to a bench-

# Intensive workshop will build OR managers' business skills

OR business managers will be able to hone critical skills at an intensive workshop April 7 to 9, 2013, in Denver.

Attendees will hear from experts in managing the business of surgical services and will participate in small groups to develop analytical and critical-thinking skills.

The workshop opens on Sunday, April 7, with a welcoming reception and introduction of the speakers. A full-day session is planned for Monday, April 8, with a half-day session on Tuesday, April 9.

### Hands-on sessions

The workshop will include hands-on sessions on the capital acquisitions process and revenue cycle management.

Attendees will have a chance to work through the steps in capital acquisition, using either their own project or an example provided by the speakers.

Leading the session will be Glenn Kaleta, MBA, and Arshia Wajid, MBA, MPH, business management experts from Northwestern Memorial Hospital in Chicago.

The session on the revenue cycle will focus on charging, the revenue cycle process, and regulatory requirements.

Participants will have the option to share their charge structures in advance with the leader, Keith Siddel, JD, MBA, a national expert on the revenue cycle, who will offer an analysis (with hospital identities blinded).

An experienced perioperative nursing director, Judy Dahle, MS, MSG, RN, will address the business management of surgery from the OR director's perspective.

### Learning objectives

Participants in the workshop will:
- take home measurement tools in OR business management that they can adapt to their own settings
- explore how to use dashboard indicators effectively
- define techniques for identifying cost savings
- discuss financial forecasting, budgeting, and trending
- practice strategic planning and project development.

### Who should attend

The workshop is designed for business managers from all hospital settings who are involved in business decisions that affect the OR's economics, technology management, and program development. ❖

*Learn more and register online at www.ormanager.com.*

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mark, and you have an ineffective OR committee that doesn't manage the schedule well, you will have a hard time meeting the benchmark," Voight notes.

ORs with leading performance typically have an effective perioperative governing body that acts like a board of directors for surgical services, he says. The governing body sets and enforces policies for scheduling, block time, add-on cases, and related issues.

Accountability for labor productivity should extend beyond nursing to the entire perioperative leadership.

"Variances in labor productivity aren't just about turning the rooms around quickly," Voight says.

"It's about scheduling, scheduling management, and having effective perioperative governance to start eliminating gaps and managing overtime." ❖

*—Pat Patterson*

*Patrick Voight can be reached at pvoight@deloitte.com.*

*To learn more about calculating and managing worked hours/unit of service, listen to the webinar, Managing Labor Productivity in the OR, available for purchase at www.ormanager.com.*

# Safer Surgery: The preoperative testing process

*Ten elements of safer surgery. The third in a series, this article focuses on presurgical evaluation.*

**M**aking sure patients have the appropriate preoperative preparation, including testing, is necessary not only for patients' safe care but also for a smooth process on the day of surgery.

Advocate Health Care, a Chicago area system, has standardized preop testing requirements and the patient history form for 9 of its hospitals to help streamline the process. The preadmission testing (PAT) is one of 10 components of Advocate's Safer Surgery program (sidebar).

The project was led by David Young, MD, director of preanesthesia testing, and Cindy Mahal-van Brenk, MS, RN, CNOR, executive service line director for surgery at Advocate Lutheran General (ALG) Hospital in Park Ridge, Illinois. Dr Young is also a consultant with Surgical Directions.

ALG performs about 12,000 procedures a year in its main OR and 6,000 in its ambulatory surgery unit.

In developing its preoperative program, ALG strived to achieve what Dr Young terms "the ideal PAT state":

• Patients are preregistered by phone within 24 hours of surgery scheduling. As soon as patients are preregistered, they are triaged for PAT.

• Patient charts are completed 3 days prior to surgery as a goal.

• The patient history tool is standardized in the patient record.

• Lab and ECG testing is conducted on site in a location convenient for patients.

> "
> ## Cases are reviewed in a daily huddle.
> "

• Testing is determined according to standardized guidelines based on the patient's condition and complexity of surgery.

• Guidelines are established for lab and ECG results that will be considered abnormal.

Here's a look at each step in the process.

## Registration and triage

As soon as the hospital receives a surgical scheduling request, the patient is preregistered by phone, and the procedure is given an encounter number, allowing the nurses to document in the record.

When scheduling, surgeons' offices must fax a standard form with certain required information, such as the patient's diagnosis, the procedure, and any comorbidities. (See February 2013 OR Manager. The form is available in the OR Manager Toolbox at www.ormanager.com.)

The registration department contacts the patient to set up a phone screening or in-person appointment. The decision for phone screening or an appointment is primarily the surgeon's choice. Patients who are admitted and do not have a primary care physician on staff are assigned a hospitalist, who will see them in PAT.

## PAT guidelines

ALG prefers that surgeons and primary care physicians delegate

preop testing and evaluation to its PAT department. Many physicians do so because it streamlines their process and helps ensure that a case won't be canceled because the patient wasn't evaluated according to the appropriate guidelines.

"A primary care physician doesn't want to lose surgeon referrals by not having patients properly prepared for surgery," Mahal-van Brenk notes.

## Preop appointments

About 20% of ALG's patients are seen in person before the day of surgery. The PAT unit is located on the first floor with valet parking available, and testing is performed at that location.

The PAT department has 2 sections. The preop evaluation unit where patients are seen is staffed

by experienced RNs and hospitalists. Charts are assembled and preop phone calls are made in a separate office. The unit is staffed by 7 RNs.

### Meeting the 3-day goal

Meeting the goal of having patients' charts prepared 3 days ahead of surgery requires coordination. Documents are managed electronically using fax-filing software to avoid having to manage paper forms.

"When a patient's information comes in, it goes into the patient's chart—an electronic file folder— by day of the week they are having surgery," Mahal-van Brenk explains.

Nurses review lab results and other information as it comes in, referring to guidelines for abnormal test results.

If a finding is abnormal, it is immediately sent to the primary care physician or to one of the hospitalists as the first line of triage.

If information is missing 3 days before surgery, nurses contact the office. Mahal-van Brenk instructs them to communicate directly with the physician or the physician assistant rather than leave a phone message. Text messaging can be helpful.

### Daily huddle

Missing information is also addressed in the daily huddle held to review the next day's cases. The huddle, attended by representatives from anesthesia, nursing, PAT, and sterile processing, reviews the schedule, chart completeness, and other preparations needed to make sure surgery proceeds safely and smoothly.

"If a chart is incomplete, we usually make a call [to the surgeon] to say it can't be the first case," she notes.

> **"Meeting one on one is the key."**

If an office has a pattern of incomplete charts, Mahal-van Brenk follows up herself, contacting the office and meeting with the staff if necessary. She also takes time to meet with new office staff.

"We meet one on one to get them on board and explain the process," she says. "That builds relationships, and they have a resource to ask questions. That one-on-one time is key."

### Achieving consensus

Because the Advocate hospitals have worked together on multiple projects, a process was established for developing consensus on preop testing and evaluation guidelines. The guidelines were developed by a team of nurses and anesthesia providers who examined current standards and best practices, Mahal-van Brenk says.

Having a project manager is essential when conducting a project across multiple facilities, Dr Young stresses, adding that this role can't be performed by a person who already has another clinical or management position. "Someone has to own the process who doesn't also have a full-time position in their own facility."

### Communicating with MD offices

To make sure all of the physician offices were familiar with Advocate's preop guidelines and the expectations, Mahal-van Brenk and

Dr Young met with them directly.

In the meetings, "We let them know what we were doing, why we were doing it, and explained the hospitalist model.

"The hospitalists help them postoperatively," she points out, "because they follow their patients in the hospital, managing their diabetes, resuming blood pressure medication, and so forth." ❖

*—Pat Patterson*

*Previous articles in the series focused on OR governance (January 2013) and safer surgical scheduling (February 2013).*

*Mahal-van Brenk and Dr Young will present an all-day seminar on the 10 components of Safer Surgery at the OR Manager Conference September 23-25 at the Gaylord National Resort in National Harbor, Maryland. www.ormanagerconference.com*

## Sleeve gastrectomy now most common bariatric surgery

A recent increase in laparoscopic sleeve gastrectomy at academic medical centers has reduced use of gastric banding and gastric bypass, a study finds.

In 2012, laparoscopic sleeve gastrectomy made up 36% of bariatric procedures, with a reduction in gastric bypass (56% laparoscopic, 3% open) and gastric banding at 4%. That compares with 2008 when the most common bariatric procedures were gastric bypass and laparoscopic gastric banding. ❖

*—Nguyen N T, Nguyen B, Gebhart A, et al. J Am Coll Surg. 2013;216:252-257.*

## Patient safety

# Why are there so many unneeded preop tests?

What preoperative tests does your facility require for a healthy 40-year-old having a knee arthroscopy? What about a healthy 82-year-old having an elective procedure? Do these patients need testing at all?

A good deal of testing is performed without clinical indications, studies have found.

Researchers at the University of Texas Medical Branch (UTMB), Galveston, are learning more about what drives overuse.

In 2 reports in the past year, they documented unnecessary testing in patients having elective hernia surgery and patients having noncardiac surgery who had cardiac stress testing.

They're also finding wide geographic variations, similar to those seen for elective surgery. They've learned testing is more prevalent in areas with higher rates of malpractice suits.

The findings are leading to discussions about the need for standardized national guidelines, Taylor Riall, MD, PhD, associate professor in the Department of Surgery at UTMB, told OR Manager. She also holds the John Sealy Distinguished Chair in Clinical Research.

### Studies document overtesting

In the study of elective hernia repair, 64% of 47,000 ambulatory surgery patients had preop laboratory testing. More than half of those with no documented comorbidities had testing. Yet test results didn't make a difference in whether surgery went forward. In a subgroup tested on the day of surgery, 62% had at least one abnormal result, but hernia re-

> **"**
> **A national effort is needed.**
> **"**

pair was performed anyway. Nor did the abnormal results predict postop complications these patients would develop.

In the second study of 75,000 Medicare patients having noncardiac surgery, 4% had a cardiac stress test though they had no indications for that test. Unnecessary testing rates varied geographically from 2.7% in the Pacific West to 4.7% in the Midwest.

This unneeded testing could be a significant cost to Medicare, which reimburses from $92 to $341 for a stress test, depending on the type, the authors commented.

### Overtesting in the elderly

Overuse of testing is even more prevalent in healthy older patients, Dr Riall's group has learned. An analysis of Medicare data showed 75% of those aged 81 to 90 having elective surgery had preop testing without an indication, compared to 33% of patients under age 20.

Focusing on Texas, they discovered testing patterns varied widely in the Medicare population.

"You would expect that 80-year-olds having hernia repair in an elective setting would be similar no matter where they live," she says. Yet chest x-ray rates ranged from 10% in some locales to 90% in others. ECGs and other tests showed similar variations.

"This suggests physician or fa-

cility practice patterns and not patient characteristics are driving the use of laboratory testing," she says.

### Communication gaps?

Dr Riall has observed that there's often miscommunication about which tests are needed. In her organization, 80% of the tests are ordered by surgeons.

"A lot of surgeons we talk to say, 'We wouldn't order the tests, but the hospital or facility requires it,'" she notes. "Or they say, 'The anesthesiologist will cancel the case if we don't order them.' Then the anesthesiologists will say, 'We don't require these tests, but the surgeons order them.'

"Many are ordered by residents. They do it because they're afraid the case will be canceled if they don't," she says.

The researchers plan to survey surgeons in Texas about tests they are required to perform.

Though many hospitals and health systems have developed their own consensus guidelines on testing, Dr Riall believes a national effort is needed.

"I think we have to develop clear and consistent guidelines that all of the groups would agree on," she says. That might also help to alleviate worries about malpractice suits. ❖

*—Pat Patterson*

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# Synergies are flowing from combined ST, CS role

A float position that combines the duties of a surgical technologist (ST) and a central service (CS) technician creates closer ties between the OR and CS departments and improved morale in CS for a 400-bed community hospital.

"These have been independent workforces, but they are highly related," says Brian Whorley, business and supply chain manager for surgical services at Boone Hospital Center, Columbia, Missouri, which has 22 ORs.

"The OR can't function without CS. It was a great opportunity for synergy between those departments."

The OR and CS departments both report to the director of surgical services, Julie Miller, RN.

## Opportunity arises

The opportunity arose when graduates of the local ST program were finding the job market to be limited. At the same time, there had been turnover among Boone's CS technicians.

"We thought, is there an opportunity to do cross-training and labor sharing?" Whorley says.

The idea: Hire 4 ST grads into a combined CS/ST position with the expectation that they would float between the departments. Some had already done their practicums at Boone. Four more have since been hired into the combined "float tech" role. They typically spend 3 days a week in the OR and 2 days in CS. The program has been in place for over a year.

The float techs report to the CS department with a dotted line to supervisors in the OR. This is to ensure that their organizational "home" is in CS and to counteract a natural tendency

> "
> ## The floats are ambassadors.
> "

STs might have to migrate to the OR if they have additional time.

The float techs are paid the same rate as the STs. Pay for the 2 positions varies by only about 10%. The combined positions are budget neutral, Miller notes.

## Orienting float techs

The initial group was oriented first to the OR.

"We quickly found them a home," says Heidi Woods, RN, OR clinical supervisor, referring to the initial specialties where the float techs focused.

When the second group of float techs was hired, their orientation started with CS, which Woods says was not as successful.

Float techs are not assigned call. Miller says she was concerned that it would take longer for the new STs to gain the experience necessary for them to be able to take call when their duties were split between 2 departments. Now some do pick up call from colleagues.

## Role elevates quality

The combined position "has been a huge highlight for CS," Woods says. "CS is a vital part of what we do in the OR, but before there was a disconnect. They didn't fully understand their role in patient care.

"I think this role has elevated

the overall quality of the department," she continues. "The floats are ambassadors for both departments."

John Bequette, the CS supervisor, adds, "It has raised the overall professionalism and quality of our product as the floats mingle with the CS techs."

It's not uncommon, he says, for float techs on a Wednesday to assemble trays they will need for their Thursday cases.

"They know when they open a tray on the field, they will have exactly what they need."

Leaders of both departments work together to account for the techs' time.

"We wanted to let [their activities] flow without making the time accounting be cumbersome," Miller says.

## Lessons learned

Miller offers suggestions for those who want to try a similar arrangement:

- Manage the expectations of employees hired into the combined position.

  "Let the candidates know it is a work in progress," she says. "Let them know, 'We are committed to making this work, but we will be learning.'"

- The leadership teams in OR and CS must work in concert for the position to be successful.

  "If there are conflicts or a lack of coordination, those will be exacerbated by sharing employees," Miller says. "Here the communication flows, and problem solving happens easily."

Given the choice now, Bequette says he thinks that the float techs would not want to trade their positions for a full-time ST role. ❖

*—Pat Patterson*

# Have you taken steps to avoid the abuse of IUSS?

I have heard the following statement from OR personnel: "We use rigid sterilization containers and run a 270-275ºF (132-135ºC) prevacuum steam sterilization process in our OR. So we no longer use IUSS."

Is that an IUSS cycle?

IUSS, or immediate-use steam sterilization, was formerly known as flash sterilization.

**Sterilization & Infection Control**

This article discusses the what, when, and how of IUSS along with risks, the Joint Commission perspective, and how to minimize use of IUSS.

## What is IUSS?

The Multi-society Immediate-Use Steam Sterilization statement issued in 2011 broadly defines "immediate use" as the shortest possible time between a sterilized item's removal from the sterilizer and its aseptic transfer to the sterile field. The sterilized item is:

- used during the procedure for which it was sterilized
- used in a manner that minimizes its exposure to air and other environmental contaminants
- not stored for future use
- not held from one case to another.

The standard, Comprehensive Guide to Steam Sterilization and Sterility Assurance in Health Care Facilities (ST79) from the Association for the Advancement of Medical Instrumentation (AAMI), in section 2.61 defines IUSS as a "process designed for the cleaning, steam sterilization, and delivery of patient care items for immediate use." AAMI ST79 also states, "Since drying time is not usually part of a preprogrammed

> **" What makes IUSS different? "**

cycle for immediate-use, the items processed are assumed to be wet at the conclusion of the cycle."

## IUSS cycles

An IUSS cycle can be either a gravity or dynamic-air removal (eg, prevacuum or steam-flush pressure-pulse) cycle run at 270-275ºF (132-135ºC) for the time recommended by the device manufacturer's written instructions for use (IFU). This includes extended cycles if required. What makes IUSS different from terminal sterilization is that there is no dry time. That is why items must be used immediately.

AAMI and AORN recommend using rigid containers intended for IUSS cycles to protect instruments during aseptic transfer to the sterile field. Processing unwrapped items is not recommended, because they are wet and could become contaminated during the transfer process.

So the answer to the question, "Is processing instruments in a rigid sterilization container at 270-275ºF (132-135ºC) in a prevacuum steam sterilization process considered IUSS?," is yes, if there is no dry time, and the items are wet at the end of the cycle.

## When to use IUSS

AORN states IUSS "should be used only when there is insufficient time to process by the preferred wrapped or containerized method intended for terminal sterilization." IUSS "should not be used as a substitute for sufficient instrument inventory."

AORN, AAMI, and the Centers for Disease Control and Prevention agree that IUSS should not be used to sterilize implants.

## How to use IUSS

Here are the steps to keep in mind:

- Medical devices processed by IUSS should be cleaned, packaged, and sterilized according to the manufacturer's IFU.
- Cleaning should be performed in an area that has the equipment (eg, sinks and mechanical and/or ultrasonic washers), cleaning agents, tools (eg, brushes), and water quality needed to follow the medical device manufacturer's IFU.
- If the OR processing area does not have the appropriate setup, devices should be sent to the sterile processing department (SPD) for cleaning, packaging, and sterilization.
- Packaging material should be that recommended by the device manufacturer's IFU and should provide protection for aseptic presentation. Unwrapped trays are not recommended.
- The sterilization cycle, exposure time, temperature, and drying times (if recommended) should be followed. It is no longer acceptable to run a 3- or 10-minute 270-275ºF (132-135ºC) gravity cycle for IUSS unless those cycles are recommended by the device manufacturer's IFU.
- The same sterilization cycle and parameters used in SPD need to be used in the OR. This may require the use of an extended cycle, eg, 270-275ºF (132-135ºC)

## Why is immediate use sterilization being used?

More than 80% of the time in a study at one large hospital, immediate-use steam sterilization (IUSS) was used for reasons other than its recommended purpose—intraoperative contamination, such as when an instrument is dropped. The most common reasons documented were:
- operating room turnover
- receipt of an unsterile instrument
- intraoperative contamination
- contamination from breaches in packaging
- a one-of-a-kind instrument.

*—Zuckerman S, Parikh R, Moore D C, et al. Am J Infect Cont. 2012:40:866-871.*

gravity cycle for 30 minutes, or a 270-275ºF (132-135ºC) dynamic-air removal cycle for 10 minutes.
- The sterilization cycle should be documented with physical monitors and chemical and biologic indicators (BIs) and the results documented along with the name of the patient.

AORN states that because these devices are hot and wet, care should be taken to transport the devices to the point of use "in a manner that minimizes the risk of contamination of the item and injury to personnel."

### Take care to document

A recent study by Zuckerman et al, conducted in Vanderbilt University Hospital's main OR, identified potential lapses in practice related to IUSS, including incomplete documentation of:

> "
> # Strictly assess the rationale.
> "

- use of chemical and BIs (ie, used in each load)
- peak temperature
- cycle time
- description of specific instruments sterilized.

The authors encourage "institutions to strictly assess the rationale for IUSS and documentation of core IUSS components. Only through sound documentation can practices be monitored and quality improved."

### Joint Commission perspective

John Rosing discussed observations about IUSS from Joint Commission surveys in the October 2012 OR Manager. He noted: "Joint Commission surveyors won't cite an organization for sterilizing instruments for immediate use. Rather, they will check that data is being collected on instances when immediate-use sterilization is used and then check to see if action is being taken based on the data. If surveyors don't find that, they may cite the organization under the performance improvement standards."

Data to collect routinely and to aggregate monthly, Rosing advises, includes:
- the number of IUSS episodes attributed to lack of instruments
- the evaluation completed by OR leadership and submitted to the infection control committee for

its evaluation.

The committee should present its data on the number of IUSS episodes that were due to a lack of instruments to the hospital's finance department to justify the need to buy more instruments.

### Traceable to the patient

At the 2011 meeting of the International Association of Healthcare Central Service Materiel Management (IAHCSMM), a Joint Commission surveyor said that the Joint Commission is also interested to see that any devices, including implants, processed by IUSS be traceable to the patients on which they are used or implanted.

AAMI ST79 Section 10.3 states: "IUSS of implantable devices is not recommended; however, if it is unavoidable, full traceability to the patient should be maintained." Traceability is important because of the serious consequences of infections related to implants.

### Releasing implants

AAMI ST79 also states that "releasing implants before the BI results are known is unacceptable and should be the exception, not the rule." AAMI ST79 has 2 forms in Annex L that can be used to track documentation of premature release of implants. One is an Implantable Devices Load Record, and the other is an Exception Form for Premature Release of Implantable Device/Tray that includes documenting why premature release of the implant was needed and what could have prevented this premature release.

Joint Commission surveyors will check these forms to see how many implants are released

before the BI is available. They will expect to see a Department of Surgery policy that includes multidisciplinary input to address who can authorize early release of implants. The Joint Commission suggests this be a surgeon.

### How to minimize IUSS

Be sure you and your superiors are aware of the Joint Commission's National Patient Safety Goal 07.05.01, in particular EP 4, which states: "As part of the effort to reduce surgical site infections, conduct periodic risk assessments for surgical site infections in a time frame determined by the hospital." This could be interpreted to apply to IUSS. Conduct a risk assessment to determine why the facility is using IUSS and determine how to eliminate all reasons except for intraoperative contamination.

The data collected, as suggested above, will assist in this risk assessment.

### Policy on loaners

As a result of the risk assessment, your facility may determine that the policy and procedure for loaner instruments needs to be updated and/or enforced.

Communication is key. When loaner sets are used, the correct instrumentation needs to arrive at least 2 business days before the scheduled case to facilitate proper cleaning, sterilization, and quarantine of implants until the BI results are negative. The IAHCSMM position paper and sample policy are invaluable tools to use in this process.

Management teams from the OR, sterile processing, infection prevention, and risk management need to work together to develop

> **"**
> **Collect data routinely.**
> **"**

policies and procedures to ensure IUSS is not performed for convenience. Abuse of IUSS has the potential to increase risk for development of SSI. ❖

*—Martha Young, MS, CSPDT President, Martha L. Young, LLC, providing SAVVY Sterilization Solutions for Healthcare Woodbury, Minnesota*

*Martha Young is an independent consultant with long experience in medical device sterilization and disinfection.*

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# ASCs jump on the surgical checklist bandwagon

Since the early days of aviation, pilots have used checklists before, during, and after each flight. Cooks follow recipes. Builders don't build without team meetings and signoffs at every step.

Health care professionals, however, only recently began to adopt checklists. Often, the excuse has been that medicine is an art, and surgeons might find checklists too confining. Yet it was a surgeon who led the way in developing surgical checklists, and they are saving lives in US hospitals and around the world. Now the surgical safety checklist is taking off in ambulatory surgery centers (ASCs).

## Global goals, local efforts

The South Carolina Hospital Association is in the final year of a 3-year project to implement safe surgery checklists in all of its member hospitals, and ASCs are coming on board as well.

Since 2011, AnMed Health Medicus Surgery Center in Anderson, South Carolina, has been using a checklist developed by

> "Incorrect checklist use is common."

the World Health Organization (WHO) and endorsed by the Harvard School of Public Health. Harvard is sponsoring a project called Safe Surgery 2015, in which state hospital associations set a goal of 100% participation in the use of surgical checklists by the end of that year. North Carolina and Virginia recently adopted the checklist program.

Teresa DeVore, RN, quality improvement coordinator for the surgery center, worked with the Harvard team to develop an ASC-appropriate checklist and to promote it with other surgery centers.

"We embraced a culture of safety before this project," DeVore says, "but welcomed the idea of improving through the checklist."

Heading the Harvard team as executive director is Atul Gawande, MD, FACS, a general surgeon at Brigham and Women's Hospital in Boston who may be considered the father of the surgical checklist.

In his book, The Checklist Manifesto: How to Get Things Right, he describes working with WHO to improve surgical safety, an effort that included the painstaking development of a checklist that has saved lives in remote areas of developing countries as well as in the wealthiest cities.

## Four big killers

"Surgery has, essentially, 4 big killers wherever it is done in the world: infection, bleeding, unsafe anesthesia, and what can only be called the unexpected," he explains in the book. The first 3, he notes, are perfectly suited to a checklist, which covers routine tasks that, for various reasons, are often forgotten. The unexpected

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events are complex situations that call for a different approach: the pooling of expertise. The WHO researchers found that the best solution was "to have people stop and talk through the case together." That meant clinicians, including surgeons, would have to operate as a team.

Dr Gawande confesses that as a surgeon he was skeptical of the need for these precautions.

"To my chagrin, however," he writes, "I have yet to get through a week in surgery without the checklist's leading us to catch something we would have missed."

### Flying right

To learn how checklists work, Dr Gawande questioned people from other occupations. He watched as they built skyscrapers, managed restaurants, and analyzed investments, and he found that they all used some form of checklist to avoid mistakes.

It was the aviation checklists, however, that provided the most useful model for the surgical checklist. Dr Gawande learned from the Boeing Corporation manager in charge of designing checklists for the company's aircraft that pilots use many checklists. Some are for routine procedures such as preflight inspections and preparation for takeoff. Others govern emergencies. Each has been tested and revised to ensure it contains the critical steps needed for every situation.

Like aviation, surgery is time-sensitive, technically complex, and performed by highly skilled individuals who must work as a team. Unsurprisingly, surgeons who happen to be pilots appear to

be most comfortable using checklists.

DeVore recalls how an AnMed ophthalmologist, after receiving his checklist, became its in-house champion. The physician, a licensed pilot, assembled the surgical team for the time-out, introduced the checklist, and told the surgical technologist to call out the item related to verifying the correct lens implant.

"That was an indication that surgeons were buying into the program," she says. "It doesn't matter what your title is. We're here to work as a team. We're here to do what's right for the patient."

### The WHO trials

After trials and revisions, the WHO panel that included Dr Gawande field-tested the checklist at 8 hospitals representing different conditions and cultures, in rich and poor countries, and rural and urban locations. Researchers tracked complication rates 3 months before and after introduction of the checklist. Among 4,000 patients, they found that major complications declined overall by 36%, and the death rate dropped by 47%.

"Using the checklist had spared more than 150 people from harm—and 27 of them from death," Dr Gawande says.

In January 2009, the New England Journal of Medicine published the study results. Hospitals

around the world showed interest in the checklist. Actual implementation was slow, however; even when the checklist was available, it was often ignored or skimmed over, studies showed.

"A lot of people say they use it, but very few use it correctly," explains Lizzie Edmondson, senior project manager of the Safe Surgery 2015 team. After Washington's hospital association mandated use of the checklist, her team conducted a small study of 5 hospitals and found only 2 had successfully implemented it. Through communication with numerous other hospitals between 2009 and 2010, they found few were using the checklist meaningfully or getting the most out of it.

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**ANMED HEALTH**
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SAFE SURGERY 2015:
SOUTH CAROLINA

## Pre-Op Checklist

### *Before Patient Enters the Room*

**Nurse and Anesthesia Provider Review:**
- ❑ Patient identification (name and DOB)
- ❑ Surgical site
- ❑ Surgical procedure to be performed matches the consent
- ❑ The site has been marked
- ❑ Patient position
- ❑ Known allergies
- ❑ Patient weight
- ❑ Implants available in the OR
  - Correct type and size
- ❑ Essential imaging available

**Nurse Discusses:**
- ❑ **Risk of hypothermia - operation >1 h**
  - Warmer in place
- ❑ **Risk of venous thromboembolism**
  - Boots and/or anticoagulants in place
- ❑ **Does the patient need:**
  - Foley
  - Tourniquet

**Anesthesia Provider Discusses:**
- ❑ Anesthesia safety check is completed
- ❑ Type of Anesthesia
- ❑ Changes in patient's cardiac history
- ❑ Changes in patient's respiratory history

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## A national movement

In 2008, Harvard joined the Institute for Healthcare Improvement (IHI) in Cambridge, Massachusetts, to promote the checklist via webinars and hospital trials. The institute proposed a nationwide "Sprint for the Surgical Safety Checklist" by challenging every US hospital to test the checklist at least 1 time with 1 operating team before April 1, 2009. As a result, 644 hospitals reported having tested the checklist.

In 2010, Safe Surgery 2015 began a program of implementation. South Carolina was the first state selected, Edmondson says, because its hospital association had already contacted Harvard to express interest.

The goal of the project is to learn how best to implement the checklist and then to use that knowledge to help other states. DeVore also is working with the Safe Surgery 2015 team to help Edmondson and others from Harvard promote the checklist via webinars and site visits.

## Support for ASCs

While the emphasis so far has been on hospitals, the Safe Surgery 2015 group has received a grant from the Agency for Healthcare Research and Quality to expand the checklist program to ASCs. Partners in this project include the South Carolina Hospital Association, IHI, the ASC Quality Collaboration, and the Ambulatory Surgery Center Association. The group began meeting in October 2012 with the goal of rolling out the ASC program in March.

## 'Poster child'

Meanwhile, AnMed has become the poster child—literally—for checklist use. A huge poster

## "
# Aviation was the best model.
"

graces the wall in each of the 3 ORs.

As part of the South Carolina project, Harvard invited ASCs to use the checklist. While all users are expected to modify the WHO checklist to fit their circumstances, ASCs may need to make more adjustments than hospitals.

"You know how fast-paced ASCs are," DeVore notes.

Most of the surgeons at AnMed were skeptical at first, partly because they feared checklists would delay procedures. But their number 1 objection was "they didn't see a need for the checklist," DeVore says.

She modified the checklist to minimize the OR time it would require. The first portion, which covers patient information, is completed in the preop area. She also consulted with the administrator and the medical director to obtain their support. "They helped me market it to the surgeons."

## Speak up!

Since implementing the checklist, DeVore continues to monitor progress and publish the results internally.

"The staff celebrates every success—every time the checklist was able to help avoid a potential error," she says.

To counter any doubt that the checklist is meant to be a team effort, the final item on the preincision portion has the surgeon state, "If you see something that concerns you during this case, please speak up."

As Edmondson notes, there is a big difference between formal adoption of a checklist and its meaningful use. The Harvard goal of adoption in all 50 states by 2015 may be met, but achieving AnMed's level of commitment everywhere is another matter.

One motivator may be the requirement by the Centers for Medicare and Medicaid Services for use of a checklist. Beginning July 1, 2013, use of checklists at ASCs during 2012 will be a reportable quality measure that will affect Medicare payments starting in 2015.

Edmondson would like clinicians to embrace the checklist for a different reason: It will benefit not only patients but also their work environment.

"We've seen it change the culture," she says. "It gives people a voice. If they see something that's about to go wrong, they can voice their concern. It's a team-building exercise, if used effectively." ❖

*—Paula DeJohn*

*The South Carolina Ambulatory Surgery OR Checklist with all 3 phases is in the OR Manager Toolbox at www.ormanager.com.*

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## At a Glance

### Errors continue in Minnesota despite time-out

Wrong surgery happened 53 times in Minnesota last year despite a statewide effort to instill use of the time-out to verify the surgical site.

Four out of five wrong-procedure errors occurred despite the mandatory time-outs, according to a new state report.

Often, clinicians don't really understand the time-out process, said Kathleen Harder of the University of Minnesota, who has observed time-outs throughout the state.

"If the site mark is not visualized during the time-out, and a team member relies on memory, that's a problem," she told the Minneapolis Star Tribune. "If that step is missed—and I have seen it missed—then wrong-site surgery can occur." The state's report and a news release are available from the Minnesota Department of Health.

*—www.health.state.mn.us/news/ pressrel/2013/ahe013113.html*

### CHG showers, baths offer no benefit in preventing SSIs

Preoperative bathing or showering with chlorhexidine did not significantly reduce the overall incidence of surgical site infections, compared with soap, placebo, or no shower or bath in a meta-analysis of 16 studies.

Overall, 6.8% of patients in the CHG group and 7.2% of patients in comparator groups developed SSIs.

The study appears in the February 2013 American Journal of Infection Control.

*—Chlebicki M P, Safdar N, O'Horo J C, et al. Am J Infect Cont. 2013;41:167-173.*

### Hospitals should not pay for device tax, GPO says

Some hospitals have reported being directly billed by at least one device manufacturer to cover the costs of the Affordable Care Act's medical device tax.

But Novation, the supply chain company, says this is wrong.

The device tax was mandated by the government after manufacturers balked at contributing to the cost of health care reform, and some have tried to make hospitals pay the tax, says Jody Hatcher, Novation's president and CEO.

"This tax should be the responsibility of the manufacturers," she notes, adding that Novation in-tends to make sure hospitals are affected as little as possible.

The device tax is expected to generate about $20 billion over 10 years.

*—www.novationco.com/*

### Night call does not compromise next-day surgery

Surgeons doing elective procedures after spending all night on call had outcomes similar to those of surgeons who had not worked the night before, a study finds.

The review of 869 general surgical procedures (hernia repairs, cholecystectomies, and bowel operations) compared 30-day post-surgical mortality, readmissions, and complications.

Among the 15% of procedures by surgeons following a night on call in a busy trauma unit and 85% of those by surgeons not on call, there were no significant differences in outcomes, according to the researchers. They noted, however, that the findings apply only to these three types of operations. ❖

*—www.acssurgerynews.com/ specialty-focus/general-surgery/single-article-page/night-on-call-has-no-effect-on-next-day-operations.html*