In this issue

Hybrid ORs: What can you expect if your hospital plans to add one?

If your hospital performs a large volume of cardiac and neuro-surgical procedures, chances are you’ll be adding a hybrid OR in the next 5 years. Demand for these high-tech rooms, which combine surgical equipment and instruments with a dedicated imaging system, has started to take off.

Among benefits are streamlined care for patients who can have multiple procedures in one episode, the ability to perform procedures less invasively, and better communication across specialties.

These complex environments are also challenging to manage. They require careful planning with close collaboration among disciplines, adept management to avoid turf battles, and well-thought-out decisions about staff training and coordination.

**Special focus: Hybrid ORs**

Articles in this issue offer advice on what to expect if you’re part of such a project:

- Page 7: Hybrid ORs: What’s behind the increasing demand?
- Page 10: Planning and staffing a hybrid OR

Looking to front-line clinicians, staff for lasting improvements

A patient with a multidrug-resistant infection is coming to your OR. That patient will travel from her room—one of the most contaminated areas of the hospital—to surgery, which is perhaps the cleanest. How can her caregivers avoid cross-contamination that could transmit the infection to others?

At 219-bed St Patrick Hospital and Health Sciences Center in Missoula, Montana, the answer is to look to its front-line clinicians and staff as well as for best practices from outside the organization. The approach, called Positive Deviance, or PD, stems from the idea that the best and most lasting improvements come from clinicians and staff who care for patients every day.

“Positive Deviance is based on the premise that solutions to tough problems that have not responded to traditional approaches already exist within the community that faces the problem,” explains Jon Lloyd, MD, a surgeon and a proponent of PD. He is coaching hospitals on PD
Some of the toughest decisions are made long before the surgery starts.

Like whether the hybrid OR makes financial sense for your facility. Or which hip implant is the safest and most cost-effective? Or should you replace your infusion pumps before a major recall happens?

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The surgeon was marking the wrong foot while talking to the patient about something social . . . I opened the chart to the permit and lightly reminded him we were doing the other foot today . . . Presenting the issue to the surgeon in a nonthreatening manner saved face in front of the patient and made him grateful that I spoke up when I did.

If an incident like this happened in your OR, would your staff speak up? Unfortunately, the nurse in this story is in the minority. Only 21% to 31% of critical care and perioperative nurses in a new study say they have spoken up and fully shared their concerns directly with the person involved when they have seen dangerous shortcuts, incompetence, or disrespect.

Safety tools like checklists are making a difference, but not enough. Most—85%—reported a safety tool such as a checklist had alerted them to a problem that could have harmed a patient. But more than half (58%) didn’t speak up to address the problem.

Troubling findings on managers

Especially troubling were the findings on managers. Too few took action when the staff brought these issues to their attention—only 41% did so when they learned of a dangerous shortcut, 28% did when the issue was incompetence, and 35% did when they learned of disrespect.

The study, titled “Silent Treatment,” a follow-up to the 2005 study, “Silence Kills,” examines what the researchers say is an especially dangerous kind of communication breakdown—known risks left undiscussed. The study by the American Association of Critical Care Nurses, AORN, and VitalSmarts, a consulting and training firm, was released at the AORN Congress in March in Philadelphia.

Safety tools like checklists and handoff protocols have helped make processes safer and more reliable. But they won’t be fully effective until staff and managers find their voices.

“It’s heartbreaking to hear that nurse managers don’t feel they have the skills to address these significant concerns of their staff,” said Dorrie Fontaine, PhD, RN, FAAN, dean of the University of Virginia School of Nursing, at the press conference releasing the study.

There are signs of optimism, cited by Fontaine and Linda Groah, MSN, RN, CNOR, CNA, FAAN, AORN executive director/CEO:

- The Joint Commission now requires a code of conduct and a process for managing disruptive behavior.
- Schools of nursing and medicine are creating situations where nursing and medical students learn together.
- Progressive organizations couple checklists with team training and teaching of communication skills.

In the next issue, we’ll share some stories managers submitted in the survey. David Maxfield of VitalSmarts will offer practical steps managers can take to strengthen their safety culture.

—Pat Patterson

Download the study report at www.silenttreatmentstudy.com.

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Medtronic caused a stir in February 2011 when it canceled several contracts with the 2 largest group purchasing organizations (GPOs), Novation and Premier. The big device company ended 5 Novation contracts worth $2 billion covering spinal implants, neurosurgery power tools, bone graft materials, and cardiac rhythm management products plus a Premier spine contract.

Novation expressed “extreme disappointment” in a letter to Medtronic signed by 16 supply chain executives from major health systems such as Boston-based Partners HealthCare, BJC Healthcare in St Louis, and Sutter Health in California.

Premier referred requests for comment to the Health Industry Group Purchasing Association (HIGPA), which bluntly stated that Medtronic’s decision “puts greed ahead of patients, and is nothing short of an attack on America’s hospitals.”

Without the ability to benchmark pricing through GPOs, HIGPA said hospitals would be left “to negotiate with a device maker that will now be able to charge whatever local markets will bear.”

Rural hospitals, especially, would be at a disadvantage, HIGPA said, because they would not have the size and volume to leverage against a corporation the size of Medtronic. Is more to come? Does Medtronic’s move signal a shift in the relationship between companies and GPOs?

Medtronic “has not, as is alleged, made a decision to eliminate all GPOs,” company spokesman Christopher Garland wrote OR Manager in an email. He said the company believes it can best meet its customers’ “varied needs” using a local approach, noting about 85% of its contracts are already negotiated that way. He said the company is evaluating its national contracts on a case-by-case basis and referred to the canceled Novation agreements as “underperforming.”

A license to fish

But supply chain experts think Medtronic’s move could break the ice, and other companies could start pulling out of GPO contracts.

“This is simply a business decision about value (or lack thereof) received. It is something that will cause companies to carefully evaluate their participation with GPOs and ask, ‘Am I getting value? Is this contract performing at the level I’m expecting?’” says Jamie Kowalski, CEO of Jamie C. Kowalski Consulting LLC, an independent supply chain consultant who’s worked with health care providers, suppliers, and GPOs.

A GPO contract is like a license to fish, he explains, but doesn’t guarantee any fish. In other words, a group purchasing contract gives a company access to potential customers under agreed-upon terms but can’t guarantee those hospitals will purchase what they commit to under a contract.

Kowalski says supplier execs have long confided their skepticism about the value they get from GPOs and “have been looking for the first

Continued on page 6
Patients can now go online to see how often their local hospital reported 8 types of serious events like a retained surgical item or air embolism. The data was posted in April on Medicare’s Hospital Compare website.

So far, the data isn’t user-friendly. You have to download a spreadsheet and scroll through hospital names by state to see how many times they reported the 8 hospital-acquired conditions, or HACs. The government is planning to fold the data into its searchable database on Hospital Compare.

In addition to retained items and air embolism, the HACs include blood incompatibility, Stage 3 and 4 pressure ulcers, falls and trauma, vascular catheter-associated infections, catheter-associated urinary tract infections, and manifestations of poor glycemic control.

Medicare does not provide additional reimbursement for cases in which a HAC is reported to have developed during an inpatient stay.

### Most, least common

In highlights from the data:

- The most common HAC was an injury from a fall or other type of trauma (1 in 2,000 discharges). Over 70% of hospitals reported at least one fall or trauma during the reporting period.

- Retained surgical items occurred in about 1 in 11,000 discharges.

- Least common was blood incompatibility, reported by less than 1% of hospitals (1 in 1 million discharges).

The government says these HACs occur often to inpatients and are costly to Medicare. They also are considered reasonably preventable.

The data cover discharges from October 1, 2008 to June 30, 2010, and apply only to hospitals that are under the DRG payment system. Critical access hospitals and other hospitals not under DRGs are not included.


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Company to start the snowball rolling.”

Companies pay GPO fees of up to 3% when their customers purchase through GPO contracts, and those fees are GPOs’ main source of revenue. But increasingly, companies question whether the fees are worth their while.

More companies could now follow Medtronic’s lead, Kowalski says, including those selling high-volume consumable supplies.

Another possible motivation for companies to pull out of GPOs is the federal medical device tax approved as part of the health care reform legislation, notes Robert Yokl, a supply chain consultant with Strategic Value Analysis in Healthcare. The 2.3% tax on companies’ gross medical device sales takes effect in 2013.

If companies were to stop paying the 2% to 3% fee they pay to GPOs, “that solves their problem with the tax,” Yokl told OR Manager.

He thinks another motivating factor may be the consulting GPOs do to reduce the cost of physician preference items like orthopedic implants, which has them working “at cross purposes to the device companies.”

### Impact on hospitals?

If Medtronic’s action snowballs, the impact on hospitals might not be as great as some would think, comments Kowalski.

As hospitals have banded together into large health systems, they’ve gained purchasing clout.

“An IDN (integrated delivery network) can get the same pricing, and perhaps better, than a GPO,” he says. What’s more, if hospitals in a system can agree to standardize on products, particularly physician preference items, they can deliver a truly committed group of customers.

Achieving that commitment is challenging for IDNs, he notes, but “is considered extraordinarily valuable to manufacturers—more so than a ‘fishing license’” in the form of a GPO contract. Kowalski adds that price comparisons are available from other sources than GPOs, noting that several independent software companies now have technology that provides this type of service.

IDNs’ purchasing power could grow further as physician groups are acquired by large health systems, and their interests become more aligned—though getting physician buy-in on purchasing decisions “is not a slam dunk,” he says.

In Yokl’s view, “the marketplace has moved. Medicare and Medicaid payments are being slashed. The device companies have already lost market because of the recession. Hospitals are putting more pressure on them. This is the new normal.”
Hybrid ORs: What’s behind the increasing demand?

Imaging has a long history in the operating room. In the 1960s, x-ray units were mounted on the ceiling, as they might be today. But the surgeon had to go to an adjacent room to view the image, and images could only be stored for 10 minutes. Mobile C-arms, introduced in the late 1960s, have been a mainstay of OR imaging. But more hospitals are finding these C-arms can no longer meet their OR imaging needs.

Increasingly complex surgical and interventional approaches require more advanced imaging. In response, many larger facilities have replaced the conventional OR configuration with new configurations known as hybrid ORs. These combine surgical equipment and instrumentation for open procedures with a fixed and dedicated imaging system as well as an imaging-compatible surgical table, lights, and surgical booms to accommodate open, minimally invasive, and interventional procedures. Hybrid ORs are housed in a sterile environment.

Demand grows

Initially, hybrid ORs were installed by facilities considered to be early adopters of technologic innovations. Though the concept of hybrid ORs was introduced in the 1990s, until 2008 adoption was slow. The high cost and complexity of implementation limited diffusion to academic institutions and well-funded community hospitals with high cardiac procedure volumes.

The rate of adoption and diffusion has begun to increase in the past few years, despite an economic recession that has limited growth in conventional surgical services. According to anecdotal reports in trade journals, the market for advanced hybrid OR imaging systems grew 17% between 2008 and 2009, while the market for more traditional surgical imaging systems grew only 1%.

Demand for hybrid ORs is expected to continue to increase, given the growing numbers of patients with complex cardiovascular and neurological diseases requiring treatment better delivered in a hybrid OR setting. Within the next 5 years, it is expected that most hospitals with larger cardiac and neurosurgery services will be planning or will have implemented at least one hybrid OR.

What’s included?

The most common configuration includes a flat-panel angiographic x-ray imaging system and surgical equipment for open cardiac surgery. Very few facilities have integrated robotic surgery, CT systems, or MRI systems into the OR setting. The second most common configuration is for interventional and surgical neuro applications, although

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Trends drive need for imaging

Trends are driving the need for more imaging in the OR:

• A growing aging population means more people are living longer to require surgery best performed with image guidance.
• More than 60% of all patients having surgical procedures are overweight or obese and often have co-morbid diabetes and cardiovascular disease.

These trends increase the likelihood of more complications during interventional procedures, often leading to the need to convert to an open surgical procedure.
• The lines between interventional and surgical specialties are blurring—interventional procedures are becoming more complex, and surgical procedures are becoming less invasive.
• Increasing numbers of patients with complex disease are forcing cardiac surgeons and interventional cardiologists to collaborate more frequently.
• New technologies approaching commercial availability for percutaneous valve replacement will require more advanced imaging in the surgical setting, according to reports by Hayes, Inc.

More complex procedures in the interventional suite mean patients will require more clinical supervision and possibly a more intense level of care.
only a few hospitals have installed dedicated neuro hybrid ORs.

Hybrid ORs cost several million dollars and include equipment from multiple vendors (sidebar, p 9). The equipment selected varies depending on the room configuration and its planned uses.

What are the benefits?

Published evidence on the clinical benefits of hybrid ORs is limited, but studies are ongoing, especially for cardiovascular applications.

Some technical and review articles (Bonatti et al, 2010; Kpodonu, 2010; Urbanowicz et al, 2010; PhysOrg.com, 2010) as well as anecdotal reports from hospitals with hybrid ORs suggest these clinical and operational benefits:

- shorter patient recovery time due to elimination of the physiologic stress related to multiple procedures with anesthesia
- decreased length of stay due to elimination of staging between multiple procedures and reduction in resources needed for patient management
- streamlined care delivery, with fewer clinical staff involved in patient care and an improvement in cross-specialty communication
- minimized risk for communication-related errors across clinical specialties
- lower overall cost of care
- potential for revenue growth—use of a hybrid OR frees interventional suites and standard ORs for additional procedures.

Procedure benefits

Current cardiovascular procedures, such as aortic stent-graft placement and treatments for heart failure and cardiac rhythm disturbances, may be performed more efficiently in a hybrid OR. A hybrid OR also has the potential to improve the clinical care of patients with complex cardiovascular disease, pediatric patients with congenital heart disease, and patients requiring valve repair. The hybrid OR is being recommended as the preferred setting for new procedures, such as hybrid coronary revascularization and percutaneous valve replacement, to improve patient safety and physician performance of complex procedures (Vahanian et al, 2010; Nollert et al, 2009).

For neurointerventional procedures, a neuro hybrid OR can potentially provide clinical benefits in complex brain and spine cases, trauma requiring neurointervention, stroke, brain aneurysm, pediatric neurovascular cases, and endovascular cases. New procedures, such as endovascular neurosurgery, are evolving as neuro hybrid ORs are able to provide advanced image guidance to allow the use of catheters and guidewires.

Successful implementation, management

Despite the benefits, successful implementation and operation of a hybrid OR may be limited by conflicts among staff and workflow problems. Some advice to ensure smooth implementation and management:

Plan for multidisciplinary guidance

Implementing a hybrid OR requires significant advance planning and coordination among multiple departments, clinical staff members, facilities personnel, and
**Hybrid OR equipment**

Equipment that may be installed in a hybrid OR (list not inclusive):
- Single-plane or biplane flat-panel angiographic x-ray imaging system
- CT system
- Surgical lights
- Surgical table
- Surgical (endoscopy) video systems
- Surgical booms
- Anesthesia system
- Robotic surgery system
- MRI system
- Magnetic catheter navigation system
- Heart-lung bypass system
- Intravascular and/or cardiac ultrasound system
- Operating microscope
- Neurosurgical navigation system.

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**Disputes regarding room usage are likely.**

Equipment vendors. Planning and ongoing evaluation by a multidisciplinary committee are essential. The committee should include key administrative and clinical staff from all specialties that will use the hybrid OR.

Too often, nursing staff, anesthesiologists, perfusionists, and technologists are excluded. As a result, critical issues are not addressed that adversely affect the hybrid OR’s operation, such as lack of appropriate OR imaging support, anesthesiology services, perfusion support, and delays in OR setup and patient preoperative care. Problems have been reported related to scheduling of equipment installations and placement of imaging equipment. Biomedical engineering and information technology staff should also be involved to ensure seamless OR equipment installation and integration with existing facility infrastructure.

**Analyze volumes**

Hospitals should analyze interventional and surgical volumes to determine if a hybrid OR would be supported by existing caseloads. Projected future volumes should also be analyzed to ascertain how a hybrid OR would affect usage of existing interventional suites and ORs.

**Evaluate infrastructure, capacity**

Thoroughly evaluate the existing infrastructure and capacity for renovation and expansion to determine if a hybrid OR can be installed in existing space or will require substantial renovation or new construction.

Renovation of existing ORs may be required because a hybrid OR requires more space than a traditional OR or interventional suite. Although space may be available in the hospital’s interventional area, the cost and effort may be substantial to ensure that converting an interventional suite to a hybrid OR will meet surgical standards. Generally, interventional cardiology and neuroradiology suites do not have positive ventilation, a scrub area, sterilization area, or access to surgical equipment and instrumentation.

Experts have reported it is less expensive and easier to construct a hybrid OR in existing ORs, where surgical support services are already in place, rather than convert an interventional suite and duplicate surgical support in another area of the hospital. In general, installing a hybrid OR in existing OR space requires only modifications for advanced imaging equipment.

**Fostering collaboration**

These suites come with other complex issues, such as collaboration across multiple departments and clinical specialties, with the potential for “turf wars.” Disputes may arise among clinical staff regarding what type of imaging and surgical equipment to include in the hybrid OR because of the large number of staff involved in hybrid procedures. Surgical and interventional physicians may “jockey for position” in the OR, and supporting clinical specialties, such as anesthesiology and nursing, may need to modify workflow to accommodate the integration of equipment.

In addition, a hybrid OR will compete with existing interventional procedure rooms and ORs. Physicians and departments may compete for time in the new hybrid OR, even when procedures could be performed in a standard OR or interventional suite. Disputes over room usage are likely, especially in facilities with high surgical and interventional volumes. Establishing room usage guidelines and scheduling can alleviate disputes.

**Potential for new revenue**

While the initial outlay for a hybrid OR is substantial, new revenue and cost savings are possible if installation, implementation, and

*Continued on page 10*
OR design & construction

Planning and staffing a hybrid OR

“Building hybrid rooms is building for the future,” says Nicholas D. Troeleman, RNFA, director of perioperative services at the University of Maryland Medical Center (UMMC), Baltimore. “Having hybrid rooms in a research setting like the University of Maryland gives physician researchers the ability to develop new techniques and build on existing techniques.”

More importantly, Troeleman says, hybrid procedures offer advantages to patients. Risks are minimized because the patient has one operative episode instead of two or more, and length of stay and recovery time are shortened.

UMMC built its first interventional suite in 2004. A pediatric hybrid OR opened in September 2010, and another adult hybrid OR will be opened later this year. The latest hybrid room will bring the total number of ORs to 31.

Troeleman and other perioperative leaders shared their advice for planning and staffing these complex surgical and interventional environments.

Designing a hybrid room

“You really need to think about the space, how to organize where to put the booms and lights, and the patterns of how you move in and out of the rooms,” says Lisa Morrissey, MBA, RN, CNOR, nursing director for the OR at Massachusetts General Hospital (MGH) in Boston, which has 1 hybrid room and will soon open 4 more in its new building, in addition to MRI and CT surgical suites.

Plan for an expanded team

Additional staff is needed for the imaging equipment.

“You need to think about the hours of operation, including nights and weekends,” Morrissey notes. “Will you partner with radiology and/or cardiology, or will you hire this staff? When you add planning and staffing these complex surgical and interventional environments.

References


For more information on hybrid ORs and emerging technologies related to hybrid cardiovascular and neurointerventional procedures, visit www.hayesinc.com.
imaging equipment, it adds to the count for your staffing pattern.”

**Negotiate service contracts**

“The contracts for preventive maintenance are quite expensive,” Morrissey advises. Whenever possible, provide in the contracts for any upgrades that become available between the time the equipment is purchased and the room is opened.

**Plan for volume**

If an existing room will be taken out of service to provide space for the hybrid OR, plan for what to do with the volume that will be displaced during the renovation.

**Evaluate infrastructure**

In particular, consider the ceiling height, weight the floor will accommodate, and size of the room. MGH constructed a mockup that enabled clinicians to understand where the OR booms and lights could move without creating a conflict with the imaging equipment. After mockups, Morrissey says, “we decided the space in one of our existing cardiac rooms wasn’t large enough to hold the imaging equipment. It would have been difficult to take care of the patient and have all of that equipment and technology in the room.”

Square footage for hybrid ORs varies by specialty, she notes. For example, MGH is adding the Zeego robotic imaging system from Siemens, used primarily for cardiovascular procedures, which requires additional space because of its robotic arm.

**Make site visits**

Site visits were helpful for the team at the Inova Heart and Vascular Institute in Falls Church, Virginia, which opened a hybrid room in December 2010 as part of an 8-room cardiac surgery suite.

The site visits allowed the team to see what they liked and didn’t like about a room and equipment and what would work for their hospital, notes Mary Kroetch, MS, RN, CRNFA, the institute’s director of perioperative services.

**Ceiling mounted or floor mounted?**

Systems for hybrid rooms may be ceiling mounted or floor mounted. Each has advantages and disadvantages.

Ceiling-mounted systems keep floor space free for OR traffic and patient flow but can impair the ability to mount OR lighting and affect air filtration systems. Floor-mounted systems keep the ceiling free for conventional OR lighting and imaging booms but affect anesthesia space, OR traffic, and workflow.

Inova’s team decided to suspend all of the equipment from booms. To make sure imaging equipment could be moved out of the way quickly if they had to convert to an open procedure, they extended the overhead rails that the equipment runs on all the way to the front and back of the room.

“We can move all of the equipment out of the way in about 30 seconds,” says Kroetch.

**Procedure tables**

Tables for hybrid rooms must combine imaging capability and positioning flexibility. Hybrid tables must be nonmetallic and made of carbon-fiber to optimize imaging equipment. They also must be able to slide back and forth, rotate side to side, and move into Trendelenburg and reverse Trendelenburg positions to accommodate intraoperative angiography and fluoroscopy equipment.

Morrissey notes that Trumpf
has recently developed a more flexible table (TruSystem 7500) that can work with a single-plane imaging system that MGH plans to install in its new building.

**Staffing training for hybrid rooms**

UMMC does not cross-train staff from the different services for the hybrid OR. Says Troeleman, “It is too difficult for the staff to be expert in all procedures and maintain competency, and it could put them at jeopardy for burnout.”

The cardiac surgery team of about 20 members assists with open, minimally invasive, pediatric, and adult cardiac cases. Staff cover call for both the main and hybrid ORs. The adult and pediatric cath labs have separate personnel.

“The multidisciplinary staff work well together. We haven’t had any turf battles and don’t expect any,” notes Cynthia Aracan, BSN, RN, a cardiac team member.

Personnel from all of the services are trained in aseptic technique and sterile setups. “They have to remember to treat the case as sterile from beginning to end. Even though the patient might be scheduled for a minimally invasive cath, the draping and room setup are treated as for a full-blown surgical case,” says Aracan.

**Introducing teams**

At Inova, different teams have been trained to the hybrid room by letting each service use the room to perform cases distinct to its specialty. This spring, the teams will begin performing percutaneous valve procedures together in the hybrid room.

Kroetch says OR staff have been cross-trained for some time to perform catheter-based interventions, such as stents for thoracic aneurysms. Though cath lab personnel perform catheter-based procedures daily, she does not plan on cross-training them for surgical procedures.

The electrophysiology (EP) staff already perform minimally invasive and percutaneous atrial fibrillation ablation procedures in the OR and the EP lab. Soon they will be performing hybrid procedures in which an interventional EP physician and an ablation surgeon work together on the same patient at the same time.

“It will be the percutaneous aortic valves that will bring all the teams together. We are very excited about doing them and doing them in the hybrid room,” says Kroetch.

**Best of worlds**

In the end, the hybrid room combines the best of all worlds to benefit the patient. The baby boomers are aging, and they are looking for options that help get them back on their feet quicker. This new type of procedure room also will enable clinicians to treat patients with complex conditions in one space with the collaboration of multiple disciplines.

—Judith M. Mathias, MA, RN

**Stark view of surgical risks for smokers**

A new study gives a stark picture of the risks of smoking for surgical patients.

In the research from the Cleveland Clinic, smokers were 1.38 times more likely to die within 30 days of surgery than never-smokers. Smokers also had significantly greater odds of pneumonia (2.09), unplanned intubation (1.87), and mechanical ventilation (1.53). Smokers were significantly more likely than never-smokers to have a:

- cardiac arrest (1.57 times)
- myocardial infarction (1.80 times)
- stroke (1.73 times).

Current smokers also had significantly higher odds of developing infections, including sepsis and septic shock.

The odds of major complications didn’t differ significantly between light smokers (1 to 10 pack-years) and never smokers. But odds were significantly greater in all patients who smoked for longer than 10 pack-years.

**A teachable moment**

The study evaluated 520,242 patients from the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database. Of these, 20% were current smokers. For the study, 82,303 of the current smokers were matched with 82,304 never-smoker controls. Matched smokers and never-smokers were compared for major and minor composite and individual outcomes.

Surgery is a teachable moment for smoking cessation and is more likely to be successful than other efforts, studies have shown.

Nurses speak up on new ORs design

OR managers have many opportunities to improve the lives of their patients. They meet with staff to review scheduling policies and infection prevention procedures. They may sit on committees to help select new supplies and equipment.

The physical work environment, however, is usually a given. The operating room may have been designed decades ago with different technologies and health priorities in mind, and there is not much anyone can do about it.

Until, that is, the hospital decides to remodel an OR suite, or even to construct a new one.

When that happens, rule one for nurses is: Get involved. Other disciplines will be meeting with architects early in the planning stages. Nurses need to speak up about their priorities as well, and have been doing so, as recent OR construction projects show.

What bugs you?

When Yale-New Haven Health System in New Haven, Connecticut, decided to add a new cancer wing that would include 12 new ORs, nurses were full of ideas. With the help of their leaders plus a receptive architect, their voices were heard, and improvements were implemented.

Ena Williams, MSM, MBA, RN, nursing director for perioperative services, says nearly all of her department’s recommendations were carried out in the new ORs.

“We helped direct the shape of the buildings, and the shape of the ORs,” she says. Among changes were the design of the recovery areas, location of supply storage rooms, and improved accessibility to pathology.

During the 4-year project completed in January 2010, the new ORs came on line one at a time as specialties moved to the new building. “That was the best decision we made,” Williams says of the gradual changeover.

After all 12 ORs were completed, opening of each was timed to coincide with opening of related patient units in the new wing.

“We managed the schedule in a way that we moved patients and units within the same week,” she says.

The decision was part of a business strategy by the hospital management, Williams recalls, and was specified in the certificate of need granted by the state for the new construction. Planned depreciation offset delayed revenue.

Before sitting down with the architect, she called together the staff, including nurses and surgical technicians. “I asked them, ‘What bugs you the most?’” she recalls. “We talked about things that were not currently working for us that if we had an opportunity to change, we would change.”

They looked at supplies, patient comfort and safety, and how best to incorporate new technology.

Striving for consistency

Over the years, OR designers have learned to plan ahead, be-

OR design: General principles

- Make each OR at least 600 square feet, larger for cardiovascular, orthopedic and other complex procedures. (The 2010 Guidelines for Design and Construction of Healthcare Facilities recommend a minimum of 400 square feet of clear floor space for general ORs, with a minimum of 600 square feet for ORs performing surgical procedures that require additional personnel and/or large equipment, such as some cardiovascular, orthopedic, and neurosurgical procedures.)
- Make the ORs identical to avoid staff having to adjust to new positions and item locations.
- Install adequate wiring, ventilation, and structural reinforcement to accommodate equipment.
- Design ORs for multiple uses because case loads and surgical techniques may change.
- Include communication tools such as wall monitors and email stations in OR design.
- Make storage space adequate and rapidly accessible; avoid distant storerooms, or expect more onsite hoarding of supplies.
- Design logistics for smooth supply transport and protection of sterile items.
- Design patient transport routes and waiting locations to provide comfort, privacy, and the growing trend toward presence of family members.

Complete information about requirements is in the guidelines.

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cause technology and clinical practice change so rapidly.

As Joyce Berger, MPH, RN, of the Health Technology Center (HealthTech) in San Francisco, warned OR Manager readers in May 2005, hospitals should plan for more computer, radiofrequency identification (RFID), and imaging equipment than they think they will need and increase the size of new ORs to accommodate additional devices and increasingly complex procedures. (HealthTech is now the Center for Information Technology and Innovation at http://citph.org.)

In the January 2008 OR Manager, medical architect Elizabeth Brott of Kaiser Permanente in Oakland, California, advised keeping room designs consistent throughout the hospital to provide greater flexibility of use and reduction of errors and placing radiology and interventional services as well as post-anesthesia care units (PACUs) on or near the OR floors.

Because of these lessons, some general principles are now accepted (sidebar, p 13).

Lowering the boom

Everyone has an opinion about ceiling booms. These are the maneuverable mechanical arms through which components such as PACS (picture archiving and communication system), lights, monitors, cameras, and other equipment, are routed in many ORs.

Proponents say they offer a major improvement over carts carrying devices that must be pushed around and plugged in, often leaving a trail of tangled wires and cables.

Critics, who appear fewer in number, counter that once installed, the booms are not easily reconfigured, particularly for specialized video equipment, meaning they reduce flexibility. For some hospitals, critics add, carts, which can be shared, are more affordable than redundantly outfitted booms.

Dottie Hays, RN, admits to mixed feelings: “The carts are not easy to roll in and out of a room. But the issue is financial. If you can’t afford to duplicate a technology in every OR, you have to be able to share, and the cart would be the way to do it.”

Hays is a design and construction consultant with HCA Healthcare in Nashville, Tennessee, where she coordinates information systems for new OR construction in HCA’s approximately 160 hospitals. HCA, which aims for consistency in design and operation of its hospitals, has opted for booms, she notes.

Deciding for booms

Providence St Peter Hospital in Olympia, Washington, also decided to put ceiling booms in the 2 new ORs it opened in January 2010 and 2 others it plans to add in 2012.

Lorna Eberle, BSN, RN, CNOR, director of perioperative services, says the decision came after the staff weighed the alternatives. “We spent a lot of time moving carts in the older rooms, so we made a conscious decision to put booms in the new ones.”

At Yale-New Haven, nurses specifically asked for booms in the new cancer wing, Williams reports. “There’s less equipment to push and assemble. The opposite view was that the carts were more flexible, but we opted for the fixed booms. We haven’t had any problems at all,” she adds.

The booms contain suction and electrosurgical equipment as well as a surgeon’s headlight in each room. “It’s one less thing for the nurse to be looking for,” Williams explains.

In a nod to ever-advancing technology, Yale-New Haven skipped the ceiling booms in rooms used for robotic surgery. The reason? Robots arrive with mobile equipment that is part of the package.

Supply cores, convenient computers

When nurses and other clinical staff developed a wish list for the new cancer wing ORs, one of the first subjects to come up was storage. Like most contemporary OR suites, Yale-New Haven’s at the time had separate supply storage areas. That arrangement was costly in the time and energy the nurses spent gathering supplies. The project team wanted a central core to hold supplies in the new wing.

“We needed storage close to the OR,” Williams says. At the same time, locating supplies in each OR was not practical either: “The trouble always is, how do you stock those high-demand rooms?”

The core makes supplies accessible with less overstocking: “We were able to reduce duplication of supplies,” she notes. “Every OR opens to the core.”

A workstation for surgeons

While the concept of a supply core is not new, another suggestion was truly innovative: At the

Continued on page 19
Laparoscopic sleeve gastrectomy for obesity

OR leaders are striving to make evidence-based decisions about new technology. OR Manager, Inc. and ECRI Institute have joined in a collaboration to bring quarterly supplements with summaries of the Institute’s Emerging Technology Evidence Reports to OR Manager readers. ECRI Institute is an independent nonprofit organization that researches best approaches to improving patient care. It does its work by analyzing the research literature and data on clinical procedures, medical devices, and drug therapies.

This summary provides a review of the literature through March 8, 2010. Updated literature searches through November 10, 2010, identified three additional retrospective comparative analyses (Abbatini et al., 2010; Birkmeyer et al., 2010; Lakdawala et al., 2010) and one prospective comparative study (Leyba et al., 2011) The findings of these studies do not change the overall conclusions of this report.

Technology description

Laparoscopic sleeve gastrectomy (LSG) reduces the size and volume of the stomach, thereby restricting food intake while preserving the stomach’s function and enabling weight loss. The surgery involves removal of most of the stomach and glands that produce the appetite-stimulating peptide, ghrelin. Postoperatively, the stomach resembles a curved slender tube, a “sleeve,” with a volume capacity of 60 to 200 mL.

Bariatric surgeons perform LSG through six ports. The surgeon first divides the vascular supply to the stomach’s greater curvature, and then longitudinally resects the stomach on its greater curvature from the antrum opposite the Latarjet nerve to the angle created between the cardia at the entrance to the stomach and the esophagus. The pylorus is preserved.

Sleeve gastrectomy was originally the first step of a more extensive two-step bariatric surgery (i.e., biliopancreatic diversion with duodenal switch) that has been typically reserved for severely obese patients (body mass index [BMI] > or = 50 kg/m²). However, interest has grown in performing sleeve gastrectomy as a single-stage restrictive weight-loss procedure.
Indications/contraindications
Bariatric surgery is indicated for individuals with a BMI of at least 40 kg/m² or a BMI of at least 35 kg/m² and one or more comorbidities for whom conservative approaches to weight loss have failed. Specifically, LSG may be indicated:

- For older adults and adolescents
- For patients with intraoperative conditions that would complicate other procedures
- For patients with certain other conditions that may be adversely affected by other bariatric surgeries
- For organ transplant recipients
- For patients who require high-dose anti-inflammatory medications
- For patients who require periodic surveillance of their stomach
- For patients for whom vertical banded gastroplasty, gastric banding, or gastric bypass has failed
- As a first-stage procedure in patients with at least super obesity who are at high risk for surgical complications

Contraindications for LSG include previous gastrectomy, severe gastroesophageal reflux disease, and Barrett’s esophagus.

Impact on hospital operations
Hospitals that have not previously offered bariatric surgery services will need to invest in special equipment, including high-capacity beds, patient lifts, laparoscopic instrumentation designed for use in obese patients, and fluoroscopic imaging tools. Surgeons and staff using this specialized equipment will require additional training. For hospitals that offer bariatric services, performing LSG should not greatly affect hospital operations.

Complications
Potential complications of LSG include conversion to open surgery and suture or staple line leaks, which may require additional surgical procedures. Also, LSG may not result in sustained weight loss.

Credentialing/training
Surgeons performing LSG should be board certified in general or gastrointestinal surgery and have completed bariatric surgery training that includes information on patient education, support groups, operative techniques, and postoperative follow-up. Surgeons wishing to perform laparoscopic bariatric surgery must complete a fellowship of 50 procedures and perform 25 cases proctored by an experienced surgeon.

Effect on other technologies
LSG directly competes with laparoscopic adjustable gastric banding and laparoscopic Roux-en-Y gastric bypass. Also, as a first-step procedure, LSG may compete with the intragastric balloon, a nonsurgical intervention deployed endoscopically.

Reimbursement/coding/payment
The U.S. Centers for Medicare and Medicaid considers LSG an uncovered service regardless of the patient’s BMI or comorbidity status.

ECRI Institute’s searches of 11 representative commercial third-party payers that provide their coverage policies online found six payers with coverage policies for LSG with restrictions and five payers with non-coverage policies.

The American Medical Association has assigned a Current Procedural Terminology code to describe LSG as a primary single-stage restrictive procedure.

Payment is linked to 1 of more than 500 inpatient diagnosis-related groups that are expected to have similar resource use across hospitals. The national 2010 Physician Fee Schedule payment rate for LSG is $1,195.

Evidence base
The evidence base consists of 21 studies that assessed 2,633 patients who underwent LSG. Eight studies were controlled trials (Frezza et al., 2009; Genco et al., 2009; Himpens et al., 2006; Karamanakos et al., 2008; Kueper et al., 2008; Langer et al., 2005; Lee et al., 2007; Vidal et al., 2008). The others were case series or registry studies (Arias et al., 2009; Armstrong et al., 2010; Cottam et al., 2009;
2006; Felberbauer et al., 2008; Fuks et al., 2009; Lalor et al., 2008; Moon Han et al., 2005; Nocca et al., 2008; Ou Yang et al., 2008; Rubin et al., 2008; Sanchez-Santos et al., 2009; Skrekas et al., 2010; Weiner et al., 2007).

**Key clinical questions/findings**

**How do clinical efficacy outcomes of LSG compare to other bariatric procedures?**
An insufficient amount of evidence for each comparison was available to reach conclusions about how the effectiveness of LSG compares to other bariatric procedures.

**How do perioperative outcomes of LSG compare to other bariatric procedures?**
An insufficient amount of evidence for each comparison was available to reach conclusions about how perioperative outcomes associated with LSG compare to other bariatric procedures.

**How do adverse event rates for LSG compare to those of other bariatric procedures?**
No conclusions can be drawn regarding comparative safety because so few studies reported the same adverse events. No single adverse event rate was statistically significantly different for LSG compared to other procedures.

**What adverse events were reported for LSG?**
The overall mortality rate was 0.9% for super obese patients and 0.2% for morbidly obese patients. The proportion of patients requiring reoperation for any reason was 3.5% in the super obese group and 2.3% in the morbidly obese group. The most common adverse event was leaking; the rate was less than 2%. Other adverse events occurred at rates of less than 1% overall.

Excerpted with permission from ECRI Institute’s database of Emerging Technology Evidence Reports. The complete report can be purchased from ECRI Institute’s Health Technology Assessment Information Service at htais@ecri.org.

ECRI Institute is an independent nonprofit health services research agency designated as an Evidence-based Practice Center by the U.S. Agency for Healthcare Research and Quality. The Institute maintains the strictest conflict-of-interest standards in the health care industry to protect against biases and ensure the integrity of its information.

**SELECTED REFERENCES**

State of Evidence Base

Quantity of Evidence Base (Low)
Only one or two studies addressed each outcome for any comparison, providing an insufficient quantity of evidence to form conclusions about comparative-effectiveness, safety, or perioperative outcomes. Including case series increased the amount of available data from which to identify adverse events. Scant information is available on long-term harms.

Quality of Evidence Base (Low)
Although three high-quality well-designed randomized controlled trials were included in the evidence base, most of the evidence comes from poorly designed nonrandomized controlled trials and case series.

Consistency of Evidence Base (Low)
For most efficacy and perioperative outcomes, only one study addressed the same outcome for the same comparison; therefore, consistency of outcomes among studies cannot be assessed. The findings of two comparative studies that assessed body mass index change and percentage of excess weight loss were inconsistent.

SELECTED REFERENCES continued...


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nurses’ recommendation, every new OR contains a workstation dedicated to surgeons. Says Williams, “The surgeons can use the computer, make case notes, and do research. They don’t have to compete with the nurses for use of the computer.” The keyboards are attached to articulating arms mounted on the walls.

Nurses have their own dedicated workstations. Each one is placed so the nurse can enter data without losing sight of the sterile field.

Not content to explain their concern to the architect, the nurses created a cardboard mock-up showing how each OR should be arranged.

Each OR also contains one or more 42-inch wall-mounted monitors, used to project procedures or to display patient records, radiology images, or other communications related to the surgery.

Access to pathology
Since the building is dedicated to cancer treatment, pathology plays a role in many procedures. The new OR layout recognizes that relationship. The pathology department is located next to the OR suite to provide immediate access during a procedure. The pathologist can pick up a specimen, give a rapid report, or send an instant message or microphotograph to be displayed on the wall screen. “So there can be a conversation verbally as well as through technology,” Williams notes.

The patient’s experience
The Yale-New Haven nurses took the design of the new OR as a chance to improve interactions with patients. The new cancer wing takes steps toward that priority.

“Most OR nurses would like to have access to patients before they enter the OR,” Williams explains. “But sometimes the prep area is too far away, so nurses don’t see the patient before the procedure.” The new ORs are much closer to patient preparation rooms, while administrative offices are farther away because they are not as critical.

The recovery areas, meanwhile, represent a creative approach to both efficiency and compassion. The large patient preparation room also serves as the PACU. Yet no incoming patient is ever wheeled to the OR past a postop patient.

Williams explains, “It is a big room, with 20 little cubbies. We use one end of the room to prepare patients. At the end of surgery, they are transported by a different hallway leading to the opposite end. As the day goes by, there are fewer new cases, and the room fills with recovering patients.”

Providence St Peter Hospital also added recovery rooms along with its 2 new ORs but followed existing layouts. “Variability is not good in an OR,” notes Eberle. “So we kept the same layout, but we added some PACU space to accommodate additional growth.”

Looking ahead
Martha Stratton, MSN, RN, MHSA, CNOR, NEA-BC, already has some ideas for when her hospital next decides to add more ORs. She is director of perioperative services at AnMed Health in Anderson, South Carolina, a member of Carolinas Healthcare System. Each of AnMed’s 2 campuses has 10 ORs, all built before Stratton joined the staff.

The ORs open into central sterile cores containing supplies and instruments. The trouble, Stratton believes, is that the ORs also open directly into peripheral hallways, from which patients arrive. She worries that because both the patient and sterile field are in the traffic flow in any given OR, infection control may be compromised.

“Think about where the sterile field will be,” she advises. “The sterile field should be in the most protected part of the room.”

Making it happen
Yale-New Haven’s experience is proof that nurse input makes a difference in the design of new ORs.

It helps to have “the right architect,” Williams notes; that is, one with experience in hospital design and appreciation of clinical and operational concerns such as infection prevention and supply distribution.

Being prepared is also important. Williams’s staff even performed time studies to demonstrate inefficiencies in travel by staff members to look for supplies. Having good data made a difference, she believes.

“We didn’t get a lot of pushback. Part of it is to be able to clearly articulate why these things are important.”

—Paula DeJohn

Reference


projects centered on eliminating transmission of Methicillin-resistant Staphylococcus aureus (MRSA) (sidebar).

“PD enables the community to discover and spread its own hidden solutions so everybody has access to them and the opportunity to adopt the same successful behaviors and strategies,” he says.

How PD works

One question St Patrick wanted to address was: How do we transport patients infected or colonized with multidrug-resistant organisms (MDRO) so the receiving unit, such as the OR, understands that these patients require special precautions? And what does the receiving unit need to do to prevent transmission while these patients are being cared for on that unit? (MRSA and Clostridium difficile were 2 MDROs of concern.)

Professional guidelines for preventing MDRO transmission don’t directly address the details of patient transfer.

In getting started with PD, Dr Lloyd explains, the first step is to involve senior administrators and clinical leaders so they understand how PD works and how results are measured. Then there is an invitation to opt in or opt out.

“PD engages only those people who want to use this approach to solve a problem,” he notes.

If senior leaders opt in, they are invited to bring their employees together for a kickoff to explain PD and how it might work at the hospital.

Hospital employees can opt in or opt out. Those who opt in are given opportunities to become actively engaged, for example, by organizing the initiative, being trained to facilitate the process, or determining performance parameters they want to follow to track performance.

“Only those who are passionate to be involved in preventing health care-acquired infections (HAIs) are involved—it’s all voluntary,” Dr Lloyd says. “No one is assigned, designated, or appointed to be involved. Over time, word gets around, and more people get involved.”

No consultants are involved. “It doesn’t work if outside experts come in to facilitate the process,” he adds. “For tough problems that require behavior change, the real experts are the front-line staff.”

A core group meets to organize how to apply PD to a problem.

“It’s best to start small and go slow so you can go fast,” Dr Lloyd notes. Usually, hospitals start with one unit to build experience and make the case.

Introducing PD

St Patrick’s employees were introduced to PD during the annual professional enrichment event, called APE. In small groups, they discussed what they do to prevent infections along with barriers and possible solutions, and reported back to the large group.

“In the first couple of APE sessions, a lot of OR people listed their barriers and frustrations” about patient transfers, notes Tammy Powers, BSN, RN, CIC, the infection prevention coordinator and a PD facilitator.

Powers saw this as an opportunity to create a core group of volunteers from day surgery, the hospital’s 11 ORs, and the post-anesthesia care unit (PACU) and hold “discovery and action dialog,” a PD technique for listening and drawing out ideas. In the core group were Powers; Carla Davies, BSN, RN, CNOR, OR manager; Michelle Sage, RN, CNOR, charge nurse; Michelle Liebe, BSN, RN, CPAN; and Ginger Martin RN, CMSRN.

Who are the ‘positive deviants’?

Front-line workers assess how the current process works. The facilitator acts as a catalyst who asks questions, not an expert with solutions. Then the core group
Performance improvement

Using positive deviance to drive change in the OR

Positive Deviance has led to dramatic improvements in tough problems around the world, from improving the survival of low birth-weight babies in India, reducing school drop-out rates in California, or improving hand hygiene in hospitals.

In a general session at the Managing Today’s OR Suite Conference, Jon C. Lloyd, MD, a surgeon and PD leader, will talk about how ORs can use PD to lead change in their departments. The conference is September 28 to 30 in Chicago.

Dr. Lloyd, a senior associate with the Positive Deviance Initiative at Tufts University, Boston, has coordinated an effort to eliminate endemic Methicillin-resistant Staphylococcus aureus in Veterans Affairs (VA) hospitals. A PD project in 2 Veterans Affairs hospitals in Pittsburgh started in 2005 led to a 50% reduction in MRSA infections, which was sustained and improved through 2009. The project included employee-generated ideas as well as established infection control protocols. (www.innovations.ahrq.gov/content.aspx?id=1853).

The results inspired and informed a 76% reduction in healthcare-associated MRSA infections in 153 VA hospital critical care units nationally. Five non-VA hospitals have replicated the dramatic reductions in healthcare-associated MRSA infections achieved by the Pittsburgh VA system, Dr. Lloyd says. This effort was supported by the Centers for Disease Control and Prevention and the Robert Wood Johnson Foundation.

Learn more about PD at www.positive-deviance.org and www.plexusinstitute.org.

identifies ‘positive deviants’—those who do things differently or have ideas about how to improve the process.

Along with PD, the group decided to perform an A3, a Lean problem-solving process, for patient transfers. The team met 5 or 6 times and drew on other PD techniques, including skits and improvis, to work out a better process for patient transfer to and from the OR.

Solutions for patient transfers

These are some solutions for patient transfers that “positive deviants” identified. All solutions came from front-line staff such as RNs, nursing assistants, environmental services workers, patient transporters, and physicians.

Communication plan

Because communication was identified as a barrier, a communication plan for patient transfers was developed. The night before surgery, the charge nurse reviews the next day’s schedule for patients who are flagged for an MDRO. Cases are flagged on the schedule, and “MDRO” is written on the time-out white board in the patient’s OR as a reminder.

Transfer process

To refine the transport process:

• Patients positive for an MDRO are not transported to the OR in their own bed if at all possible. A clean stretcher is used instead.

• The patient is transported in a clean gown with clean hands and on clean linen. Depending on the surgery, a patient may have a preop shower or bath with chlorhexidine gluconate.

• Personal protective equipment (PPE) is worn in the patient’s room. After the patient is on the stretcher and ready to be moved, the transporter cleans the side rails and head of the stretcher, removes the PPE, and performs hand hygiene. One “positive deviant” shared her idea to place the patient’s chart in a belonging bag and hang it on the IV pole along with an isolation sign. This visual cue allows all personnel to recognize the need for contact precautions.

• If the patient must be transported in the bed, the bed is cleaned as well as possible.

• After the patient is transferred to the OR table, the stretcher is cleaned and placed back in service.

• Back in the patient’s room, an environmental services worker cleans the patient’s bed and changes the linens. The bed is then brought down to the OR to receive the patient after surgery, avoiding the need for multiple transfers after surgery.

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Performance improvement

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- In the PACU, MDRO patients are placed in an isolation room.
- During surgery on MDRO patients, a runner is assigned, when available, to get supplies so the circulator won’t have to make trips out of the OR to the supply core.

Anesthesia cart solution

An anesthesiologist offered ideas for better management of the anesthesia cart.

A special cart, identified by a red “racing stripe,” was proposed for use in MDRO cases. The anesthesiologist suggested paring down the cart to essential supplies, with a fully stocked anesthesia cart outside the room.

The other anesthesiologists adopted the idea more readily than if it had come from outside their group, Powers notes.

Another innovation is to use plastic sandwich bags for storing small supplies such as needles and syringes in the cart. That way, an anesthesiologist can grab 3 bags of syringes and avoid potential contamination of syringes not needed for the case.

“When they go into the drawer and touch things, the surface of the bags can be wiped off,” Davies explains. All of the anesthesia providers now use that method.

On board with PPE

Other ideas helped to determine how protective equipment (PPE) would be worn during patient transfers in the OR.

Guidelines of the Healthcare Infection Control Practices Advisory Committee (HICPAC) recommend that health care workers caring for patients on contact precautions wear a gown and gloves for all interactions that may involve contact with the patient or potentially contaminated areas of the patient’s environment. The PPE is donned before or upon entering the room and discarded before exiting.

When an MDRO patient is brought into the OR, the entire team, including the circulating nurse and anesthesia provider, dons PPE while transferring the patient to the OR table. After the patient is draped, the anesthesia provider often continues to wear PPE, but the circulating nurse may remove PPE, discard it, and redon fresh PPE for transferring the patient to the PACU.

Once OR teams had a chance to observe and understand “what we were doing and why, we had much greater growth, especially with the anesthesia group,” Davies says.

With use of PPE for MDRO cases, OR personnel are no longer required to change their scrub suits after the case.

“We now feel we can contain [the contamination] with PPE,” she says.

Keeping PPE on hand

To make sure isolation gowns, gloves, MDRO signs, and cleaning supplies are handy, another “positive deviant” suggested a kit. Kits are placed on a table outside the OR where they are needed.

The day surgery unit has also developed a kit, and the OR offered them a spare cart to use. The cart also has a resource book and supplies such as disposable thermometers, blood pressure cuffs, and an isolation stethoscope.

“They got all of these supplies together in one afternoon, and it’s been that way ever since,” Powers notes.

Awareness about the need for contact precautions in the day surgery unit was raised when family members who had a patient with an MDRO on a medical unit started asking about wearing PPE when they were with the patient before and after surgery. The staff began making PPE available.

Environmental services management and staff have been involved from the beginning of the process.

“Our environmental services staff are very accommodating in helping us to reduce infections,” Powers says.

What’s different about PD?

How does positive deviation differ from other QI methods?

“PD helps you discover solutions you haven’t tapped yet,” Powers says. “If workers own the solutions and share them with their colleagues, the solutions are adopted a lot better than if someone from infection control comes in and tells them they have to do things a certain way.”

Sage thinks PD is easier to sustain than other initiatives.

“A lot of times, solutions are imported from the outside. They are adopted, and then people go back to their usual behaviors. With positive deviance, so many people are involved that if someone slacks off, somebody else will question them. It keeps everybody diligent.”

Dr Lloyd emphasizes that positive deviance “is for those problems that simply haven’t yielded to the standard approach to improvement,” especially if a behavior change is required.

“With health care-acquired in-
New risk calculator predicts bariatric surgery morbidity

A new risk calculator allows surgeons to model and predict the risk of complications for individual patients after bariatric surgery, a new study reports.

Available free online, the risk calculator will aid in surgical decision making and help patients better prepare for their surgery by understanding the true risks and benefits, says the American College of Surgeons (ACS). The calculator also assists surgeons and patients in choosing the type of bariatric surgery.

Using the risk calculator, surgeons can model and predict exact postop morbidities, which include wound infections, sepsis, heart attack, kidney failure, and lung failure, among others.

Recent heart attack or angina, stroke, high blood pressure, use of blood thinners, limited ability to perform basic activities or daily living, higher weight, and the type of bariatric surgery were associated with increased risk in the study.

"Surgical decision making and informed consent rely on accurate information about surgical risks," said R. Armour Forse, MD, FACS, of Creighton University, a coauthor.

He added that using the tool correctly should help patients feel more at ease with the process and the potential outcomes, knowing their surgeon is being open with them.

Surgery is underused

Bariatric surgery has proven successful in treating obesity, particularly related conditions such as diabetes, hypertension, and sleep apnea. Yet ACS says it is underused because of concerns about the risks by patients and referring physicians.

The risk calculator is based on data from the ACS National Surgical Quality Improvement Program (NSQIP), which collected data on patients who had surgery at 183 hospitals in 2007 and 211 hospitals in 2008.

Download the risk calculator at www.surgicalriskcalculator.com/bariatric-surgery-risk-calculator

New intravascular guidelines from CDC

New updated guidelines from the Centers for Disease Control and Prevention outline steps to eliminate bloodstream infections in patients with intravenous catheters, which are among the most deadly and costly health care-associated infections.

How to charge for OR time and services is a frequent source of questions from OR directors and business managers. In this column, Keith Siddel, MBA, answers questions about charging posed by members of the OR Business Management Listserv. Siddel is CEO of HRM Consulting, Creed, Colorado.

Q How should we charge for procedures performed in the OR and also performed in other areas of the hospital such as interventional radiology (eg, abdominal aortic aneurysm grafts, stent placements) and cath lab (eg, pacemaker and implantable cardiac defibrillator placements)? The OR bills for time and supplies, and the other areas bill for the procedure and supplies.

Siddel: That’s a good question because in these hybrid procedures, the OR may send staff, supplies, and even equipment to another area. The challenge is who should charge for these resources. One of the basic principles of charging is that expenses need to be allocated to the same area as revenue.

The challenges typically are: 1) only one department can charge for a single service, and 2) you need to be sure that the expenses for the resources used are assigned to the area where the charge is.

What normally happens is that the area that incurs most of the costs charges for them. For example, if the OR sends a couple of staff members to another department, which provides the supplies, equipment, and space, then that department should charge for the services. However, you also need to come up with an internal way for the OR to bill the other department for the costs of the resources the OR provided. On the other hand, if the OR provides most of the staff, supplies, and equipment, and the other area provides the space, then the OR should charge. The other department should then bill the OR for the space it provided.

There is no one right way to do this; it varies by hospital. Some hospitals, for example, might make the cath lab a subdepartment of the OR. Then all of the costs are in one area, and the OR can charge. The key to compliance is that no matter how your facility handles this, just make sure your expenses are with your revenue.

Q How should medical imaging be charged in conjunction with surgery? We were told that the radiology department could not bill for any surgery-related cases.

Siddel: This is a challenge. There is a lot of misinformation out there. Hospitals can’t bill separately for equipment like C-arms any longer regardless of whether the equipment comes from the radiology department or the OR. But that’s not to say that the equipment cost shouldn’t be built into the OR time.
Some hospitals set up a separate level of OR time charge for procedures that use radiology equipment or other specialized equipment to reflect the added cost. That is the optimal way to do it.

Radiology equipment should be treated no differently than other pieces of equipment. The cost allocation should be bundled into the procedures in which the equipment is used.

**Q** What can be charged for during a preadmission testing visit?

**Siddel:** The short answer is that you can charge only for the tests that are performed. You may not bill for the visit. That is true even though the patient is occupying space, receiving nursing care, and so forth. Still, the only things that can be charged for are the tests.

The theory is that when patients come in for tests, such as lab work and an ECG, the nursing care, the room charge, etc., are all built into the test charges, even though in reality, from a financial perspective, that doesn’t always work out.

Keith Siddel will present a breakout session titled Capturing Revenue and Taming the Chargemaster at the Managing Today’s OR Suite Conference September 28 to 30 in Chicago. Register online at www.ormanager-conference.com

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**A third of hospital patients are affected by an adverse event**

Adverse events in hospitals are even more common than thought—and more common than the usual reporting methods uncover.

A new study finds an adverse event happens in more than a third (33.2%) of hospital admissions.

Many happen in the OR. Surgery was the second most frequent type of adverse event after medication events, with hospital-associated infections third. The most severe events were related to surgery or a procedure.

Patients who had adverse events were older and had higher mortality, longer stays, and a higher case mix index than patients without an adverse event.

The study, which tested methods for measuring patient safety, found a “trigger tool” developed by the Institute for Healthcare Improvement (IHI) did the best job.

The two most common methods—voluntary reporting and using the Agency for Healthcare Research and Quality’s Patient Safety Indicators—failed to detect more than 90% of the events.

In the study, of 795 patient records reviewed using the 3 methods, 393 adverse events were detected:
- 90.1% were detected by the trigger tool.
- 1% were detected by the hospital reporting systems.
- 8.9% were detected by the Patient Safety Indicators.

**Trigger method**

IHI’s Global Trigger Tool involves having two or three trained employees review closed patient records systematically for certain “triggers,” such as a medication stop order, abnormal lab result, or antidote medication. Any note of a trigger leads to further investigation to see whether an adverse event happened and how serious it was. A physician has to examine and sign off on the chart review.

The authors say the findings should help inform efforts to detect patient safety problems.


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**More robots, more prostate surgery**

Technology and marketing rather than science have become the driving forces in prostate cancer care, a new study suggests.

From 2001 to 2005, hospitals that purchased surgical robots saw their radical prostatectomy volumes rise by a mean of 29.1 per year, while those without robots saw a mean decline of 4.8, according to a study in Medical Care.

The findings are raising concern because robotic surgery costs about $2,000 more than traditional surgery, the March 11, 2011, New York Times reported, and it’s not clear whether the outcomes are better, worse, or the same as traditional surgery. Nor is it clear how the outcomes compare to other treatments or doing nothing.

The study, involving 554 hospitals in 7 states, tracked the change in the number of robotic-assisted radical prostatectomies by hospital and by region before and after dissemination of the robot.

Overall, the number of radical prostatectomies decreased from 14,801 to 14,420 during the study period.

Ambulatory surgery center (ASC) staff, like their hospital colleagues, are battling health care-acquired infections (HAIs), but there’s a twist: Most of the newest regulations shaping ASC infection control programs are coming from state legislators, not federal officials.

So far, 9 states have passed laws requiring ASCs to report infections related to the procedures they perform on prescribed forms. That means currently 9 and potentially 50 different sets of rules will determine how ASCs combat and report infections. Meanwhile, the federal government, which in 2008 first ordered ASCs to establish and document infection-control programs along with other quality measures, is debating how it wants ASCs to submit reports on quality and infection data.

The nation’s ASCs have no way of knowing when they will be freed from this regulatory limbo, says Dawn McLane, MSA, RN, CASC, CNOR.

McLane is regional vice president of operations at Health Ventures, LLC, in Broomfield, Colorado.

Establishing a program
The reporting uncertainty does not affect the responsibility of ASCs to develop infection control programs. These were mandated in the Centers for Medicare and Medicaid Services (CMS) Conditions for Coverage section 416.51, which created a new standard for an infection control program. The rule states: “The ASC must maintain an ongoing program designed to prevent, control, and investigate infections and communicable diseases.” It specifies use of nationally accepted guidelines, which experts have been interpreting to mean those issued by such organizations as AORN and the Association for Professionals in Infection Control and Epidemiology (APIC). It requires documentation of the program and its enforcement. It mandates appointment of a “designated and qualified professional who has training in infection control,” although the type of training deemed adequate is a matter of dispute.

Incident provokes crackdown
Both the timing and tone of the new rule are widely viewed as consequences of incidents that turned a critical public spotlight on the ASC industry. In 2007 and 2008, 8 patients were infected with hepatitis C after being treated at the Las Vegas Endoscopy Center, and Nevada health officials determined that up to 50,000 people were at risk for the disease because of poor
safety practices at that endoscopy center.

Writing in The Journal of the American Medical Association (JAMA), Melissa K. Schaefer, MD and a panel of researchers noted, “The chain of events resulting from the hepatitis C virus outbreak investigation and patient notification in Nevada highlighted the lack of focused attention to infection control in ASCs.”

McLane agrees: “It certainly made the news,” she says, “and the Conditions for Coverage were being written at the time.”

The JAMA report reviewed results of a pilot program of onsite inspections in a sampling of ASCs in 3 states. Based on discrepancies in infection control practices, the authors concluded, “attention to infection control in ASCs might be lacking.”

The most common lapses identified in the pilot survey were in hand hygiene, injection safety, sterilization, environmental cleaning, and cleaning of blood glucose monitoring equipment. CMS has since updated its survey reporting documents to include these areas.

The ASC Association responded to the JAMA report with a statement saying, in part, “Since the process lapses were identified, the ASC industry has engaged in a proactive educational effort with ASCs across the country to promote adherence to the new standards.” The association also noted that its own quality monitoring program involving about 650 ASCs has found that “80% of ASCs report fewer than 1.5 postsurgical wound infections per 1,000 patients encountered.”

Delegate, but document

At many ASCs, setting up infection control programs will be a matter of formalizing policies already in place, such as frequent hand washing, protective apparel, and strict rules for single-use medications and devices. To win surveyor and CMS approval, however, the programs will have to be detailed and rigorous.

“There’s a lot of confusion about what’s required,” McLane notes. “ASCs need to know they need to have a formalized program. In the past [for infection surveillance], surgery centers would print out a list of procedures and send it to the physician’s office and ask about adverse events, including infections.”

Now, each program must have certain components, as outlined in section 416.51. McLane, who is a surveyor for the Accreditation Association for Ambulatory Health

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An ASC must prove it can:

- identify and investigate the source of an infection
- provide effective “isolation” or “separation”
- provide surveillance
- maintain written records
- provide education to members of the ASC team.

It is up to the board, or “governing body,” to establish the program. It may delegate authority to a designated person, but it must document in writing that it has approved the policies and procedures in the program and monitors compliance by the staff and surgeons.

Critical components

Those 2 components—management accountability and documentation—are critical under the new rule, McLane notes, even if an ASC has a clean track record and is diligent in following accepted practices. She recalls observing a recent survey at an ASC that had trained its staff and physicians in infection prevention. But the surveyor still wrote the center up because it was unable to document that the physicians had had their infection control training.

“When centers couldn’t document that,” she adds. “It isn’t that it didn’t happen. It just means you didn’t document that.”

What constitutes training?

Staff training ranges from posters in clinical areas to online courses to seminars offered by consultants and professional associations. The training session McLane conducts at state ASC association meetings is an example.

The CMS rule specifies that the infection control coordinator must have “training” without further explanation. While in hospitals it is common to have a full-time, certified infection prevention professional on staff, ASCs do not have that luxury.

“We’re not infection control specialists, yet we’re expected to know everything,” was the reaction of Donna Quinn, MBA, RN, CPAN, CAPA, when she began developing a program at Orthopaedic Surgery Center in Concord, New Hampshire, where she is director.

“A one-day course doesn’t fully train you. It’s superficial,” she says. She and the center’s new infection control coordinator, Mary Young, RN, rely in part on training courses offered through the state health department using federal stimulus money. New Hampshire also is one of the 9 states that will begin requiring infection reports later this year.

The ASC Association, in its publication Focus, provides a 10-question quiz to help infection control coordinators test the depth of their knowledge. (Sample question: Is flash sterilization acceptable for implantable devices? Answer: No. They should be wrapped, sterilized, and monitored with a biological indicator.)

When infection occurs

Because the government has yet to establish an infection reporting methodology for ASCs, states like New Hampshire are taking the lead in tracking ASC-related infections. Beth Daly, chief of the Infectious Disease Surveillance Section at the New Hampshire Department of Health and Human Services, has been trying to help the state’s 26 licensed ASCs prepare for the July 1, 2011, deadline for infection reporting.

The state legislature passed the law, she says, to bring ASC reporting into line with that of hospitals, which already must report infections under state law.

Daly predicts that, based on the experience of hospital surgical departments, an ASC will have to commit an additional 8 hours per month to meeting reporting requirements.

The state does not provide any benchmarks for infection rates, nor does the law include sanctions. “The law we have is all about surveillance,” Daly says. However, ASCs will have an incentive to keep infections down because the health department plans to publish facility reports on its website for patients to consider before selecting a surgery center.

New Hampshire ASCs will use a format provided by the National Healthcare Safety Network (NHSN), a division of the Centers for Disease Control and Prevention (CDC), which can be imported into the NHSN’s database whenever that requirement takes effect.

They will compile data on a 46-field Excel template that includes procedure codes, volumes, and infection rates.

Lighthearted reminders

At the Orthopedic Surgery Center, staff members attended a training session on NHSN reporting and are in the process of developing an infection control program based on the new rules.

Young says the initial focus
was on hand hygiene. “We did a survey of hand washing, and we measured the percentage of hand washing, and are making some changes to improve it,” she says. Changes include placing hand sanitizers closer to the patient care areas instead of on walls. That has made it easier for physicians to comply as they move from room to room.

She is trying to raise awareness of infection control protocols with posters and “lighthearted reminders” during meetings. “We’re making it an attitude rather than a [subject of] discipline,” she explains.

The program also addresses prophylactic antibiotic use before surgery by recording the time of administration for every patient. That will be one of the measures New Hampshire surgery centers will have to report to the health department beginning in July. For 2 years before the state issued its reporting templates, Quinn used an Excel spreadsheet to track infection control measures as well as outcomes.

In February, Quinn was appointed to the state’s Technical Advisory Work Group, where she represents the ASC industry. The group will work to develop infection control policies, and to educate the public as well as health care providers. “Help, more than discipline, is the state’s approach,” she says.

Besides New Hampshire, the following states have laws or regulations mandating infection reporting by ASCs: Massachusetts, New Jersey, Missouri, Arkansas, Texas, Colorado, Nevada, and Oregon.

Funding going away?

Both Daly and McLane say they expect more states to establish similar reporting requirements. Progress may be slower in the future, however, because of the way recent infection control efforts were funded. According to the JAMA report, CMS is conducting a national version of the 3-state study following a recommendation by the Government Accountability Office (GAO), funded through the American Recovery and Reinvestment Act, known as the stimulus, but that grant ended in fiscal year 2010.

Stimulus money also is behind programs like New Hampshire’s, and it will stop at the end of 2011, Quinn notes. She fears ASCs will be left to shoulder the financial burden.

“It’s difficult to meet those mandates with our current staff,” she says, “and we can’t afford to hire more.”

Young, meanwhile, is going to try. Her long-term goal, she says, is to bring the infection rate down to 0%. “I’m pretty excited to be part of the whole thing,” she says, “because I think it’s a really important segment of ambulatory surgery, that we don’t have infections.”

—Paula DeJohn

Wear facemasks for spinal injections

Always wear a facemask when performing a spinal injection, the Centers for Disease Control and Prevention (CDC) reminds clinicians.

Bacterial meningitis outbreaks after spinal injection continue to be identified in patients who had procedures by clinicians who did not wear facemasks, the CDC says.

Outbreaks have happened in patients who received spinal and epidural anesthesia in hospitals and in patients who had myelography at an outpatient imaging facility. The most recent reported outbreak was in October 2010.

Nearly all spinal injection procedures that resulted in infections were performed by a health care provider who did not wear a facemask. The strain of bacteria isolated from the patients’ cerebrospinal fluid was identical to the strain recovered from the oral flora of the provider who performed the procedures.

CDC recommendations

Because facemasks have been shown to limit spread of droplets arising from oral flora, the CDC recommends that health care providers:

• always wear facemasks (ie, surgical, medical procedure, or isolation masks) when performing spinal injection procedures
• adhere to all CDC recommendations for injection practices, including aseptic technique and using a single-dose medication vial or contrast solution for only one patient.


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Cloud Gate, the sculpture by Anish Kapoor, in Chicago’s Millennium Park. Photo by Patrick Pyszka.

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Fewer nurses, higher patient mortality

Patient mortality rose by 2% in units with inadequate nursing staff and by 4% when high patient turnovers increased nurses’ workloads, finds a new study.

The study included data from nearly 200,000 admissions and 177,000 nursing shifts in 43 patient units at one hospital. The authors say the study underscores the importance of flexible staffing practices that consistently match staffing to patient need and the effect of patient turnovers. ❖


FD A extends transition for Steris System 1

The Food and Drug Administration (FDA) in March extended by 6 months to Feb 2, 2012, the previously announced timeframe for STERIS System 1 customers to transition to an alternate processing system, according to a Steris filing with the Securities and Exchange Commission.

Steris asked the FDA for the extension while the agency is reviewing a Steris 510(k) application to the FDA for clearance of a biological indicator (BI) for its System 1E replacement system.

The extension also allows users additional time to assess alternatives, make changes to internal protocols, install replacement devices, and conduct training, according to the filing.

No assurance can be made about when the FDA will clear the BI, the filing notes.

Steris says it will continue to support System 1 users during the extension. ❖

—www.sec.gov/Archives/edgar/data/815065/000119312511072666/d8k.htm

Wait 8 weeks after MI for major elective surgery

The delay between a myocardial infarction (MI) and major noncardiac surgery should be at least 8 weeks, researchers suggest based on new findings.

Results showed a recent MI significantly raises the risk for a postop MI and death after major noncardiac surgery.

Postop MI decreased substantially the more time passed between the first MI and surgery (32.8% at 0-30 days to 5.9% at 91-180 days), as did 30-day mortality (14.2% to 9.9%) in an analysis of nearly 550,000 patients in California.

American College of Cardiology guidelines currently advise patients to wait 4 to 6 weeks between an MI and elective surgery. ❖


Preventing perioperative peripheral neuropathies

The American Society of Anesthesiologists has published an update of its Practice Advisory for the Prevention of Perioperative Peripheral Neuropathies. The original advisory was published in 2000.

The advisory focuses on:
• positioning of adult patients
• use of protective padding
• avoiding contact with hard surfaces or supports that may apply pressure to peripheral nerves.

The advisory applies to sedated or anesthetized adult patients in ORs, PACUs, ICUs, outpatient procedure units, and office-based practices. ❖

—Anesthesiology. 2011;114:741-754.

Download for free at http://journals.lww.com/anesthesiology/Citation/2011/04000/Practice_Advisory_for_the_Prevention_of.10.aspx