Building the business case for a hybrid OR

Hybrid ORs are proliferating in response to market, surgeon, and even patient demands, but building the business case for this technology can be challenging.

“It’s a very expensive proposition,” says Lynne Ingle, MHA, BS, RN, CNOR, project manager for Gene Burton & Associates, a healthcare technology consulting company in Franklin, Tennessee, and a former director of surgical services.

Costs can average from $3 million to $6 million, according to data from ECRI Institute and The Advisory Board Company.

With that much money at stake, the natural first question is, “Does our hospital need a hybrid OR?” When answering this question, OR managers should keep in mind that a hybrid OR is a long-term investment; short-term profits are unlikely.

Continued on page 8
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*First UK trial of Xenex FX-UV room decontamination device,* Journal of Infection Prevention, Beal, et al., 2014

Eliminate human error in your disinfection process
Editorial

The Centers for Medicare & Medicaid Services penalizes hospitals for readmissions stemming from myocardial infarction, heart failure, pneumonia, and total hip and knee arthroplasty, and in 2016, coronary artery bypass graft procedures will be added to the mix. For this and many other reasons, OR leaders everywhere are taking steps to maximize patient safety and minimize complications.

In a recent study of 346 hospitals participating in the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP), readmissions were linked with new postdischarge complications related to the procedures. Surgical site infection (SSI) was the most common culprit, occurring in 19.5% of cases.

The study included 498,875 patients undergoing bariatric surgery, colectomy or proctectomy, hysterectomy, total hip or knee arthroplasty, ventral hernia repair, or lower extremity vascular bypass between January 1 and December 31, 2012, at ACS NSQIP hospitals. The unplanned readmission rate for the entire cohort was 5.7%, with rates ranging from 3.8% for hysterectomy to 14.9% for lower extremity vascular bypass.

The authors point out that compliance with SSI prevention measures identified as part of the Surgical Care Improvement Project hasn’t proved to be effective in reducing infections. More research on SSI is needed, they say. Other key factors in a readmission prevention strategy include:

- coordination of care with the outpatient care team
- communication between physicians who initially evaluate patients and those who treat them
- patient education about postoperative care and potential complications.

Some perioperative leaders see promise in the new perioperative surgical home (PSH) model, citing shorter length of stay, fewer complications, and fewer readmissions in a University of California at Irvine study (cover story).

Leaders from other facilities also credit coordinated, patient-centered care with playing a role in readmissions. At Catholic Health Initiatives in Englewood, Colorado, for example, use of the LACE tool (Length of stay, Acuity of admission, Comorbid conditions, and the number of ER visits in the last 6 months) helps identify high-risk patients so that caregivers can better manage those patients.

“We ensure that care management, pharmacy, and the physician team caring for the patients are aware of their high risk for readmissions,” Stephen Moore, MD, senior vice president and chief medical officer, said in HealthLeaders Media’s July 2014 Intelligence Report. “Of all patients, those who trigger LACE are between 10% and 12% of our patient population. These are the folks who are responsible for about 60% to 70% of the readmissions. We’ve seen our readmission rates for all-cause over the past 3 years drop by about 15% to 20%.”

“We’ve previously reported on readmission and patient safety strategies, and we’ll continue to do so in the hope that you find these best practices useful. ✤

—Elizabeth Wood

References

http://www.healthleadersmedia.com/slideshow.cfm?content_id=312582&pg=1

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Surgical patients warmed with forced air still experience hypothermia

Even in patients actively warmed with forced air during surgery, hypothermia is routine during the first hour of anesthesia, a new study finds.

Intraoperative core hypothermia causes complications such as coagulopathy, surgical site infections, and possibly myocardial complications. It also decreases drug metabolism, prolongs recovery, and causes thermal discomfort.

Warming surgical patients to help prevent hypothermia is now the standard of care. Guidelines, including the Surgical Care Improvement Project and National Institute of Health and Clinical Excellence, suggest that patients be normothermic (ie, core temperature of at least 36°C) at the end of a surgical procedure.

Forced air is the most common warming approach; however, intraoperative core temperature patterns in patients warmed with forced air remain poorly characterized. The study, led by Daniel Sessler, MD, professor and chair of the department of outcomes research at the Cleveland Clinic, evaluated core body temperature patterns in warmed surgical patients to analyze the effects on blood loss and hospital stay.

Results

Of nearly 59,000 surgical patients warmed with forced air:

- 64% became hypothermic and had core body temperatures below 36°C during the first hour of anesthesia
- nearly 50% continued with a core temperatures below 36°C for more than 1 hour
- 20% had core temperatures below 36°C for more than 2 hours.

Core temperatures then gradually increased, and most patients had normal body temperatures by the end of the surgical procedure.

Hypothermia significantly increased blood transfusions (ie, transfusion requirements progressively increased as core temperatures fell from 1 to 8 degrees per hour below 37°C).

Hypothermia also increased the duration of hospitalization (ie, an increase in length of stay from 2.4 to 2.7 days correlated with core temperature ranges from 0.5 to 4 degrees per hour below 37°C). Only the increase in transfusions was clinically important, however.

Additional randomized trials are needed to evaluate outcomes of very mild hypothermia and whether maintaining higher body temperatures are helpful, the authors say.

An accompanying editorial by Harriet W. Hopf, MD, from the department of anesthesiology, University of Utah School of Medicine, Salt Lake City, noted that the “results suggest the need for a more comprehensive definition of perioperative normothermia and more aggressive efforts to prevent intraoperative hypothermia.”

---Judith M. Mathias, MA, RN

Reference

Meet the OR Manager Advisory Board

OR Manager’s two advisory boards play a key role in helping us to provide timely, relevant information to our readers each month. Through our collaboration with these thought leaders, we report on the most pressing issues in perioperative services management. Our board members also make a vital contribution to the annual OR Manager Conference and OR Business Management Conference by serving on the conference planning committee and sharing their knowledge in conference presentations.

OR Manager thanks all of these individuals for their time and expert advice!

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Meet the OR Manager

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Quality improvement

Surgical home
Continued from page 1

OR Manager, delves more deeply into processes.

Driving forces
A PSH provides integrated patient-centered care from the time an individual decides to have surgery through at least 30 days after the procedure (sidebar, p 10).

“The main idea of a perioperative surgical home is care coordination and reduction in variation in practice,” says Arthur Boudreaux, MD, professor and vice chair of the department of anesthesiology at the University of Alabama at Birmingham (UAB) School of Medicine and former chief of staff for UAB Medicine. “If we can coordinate everything effectively, reduce variation where it can be reduced, and minimize unnecessary and wasteful interactions with patients, like wasteful labs, hopefully we will reduce complications, reduce expenses, and better meet patient expectations.”

By improving continuity through better integration of care, the PSH can counteract what Dr Stead calls the “shocking” numbers for readmissions. According to a 2013 report from the Robert Wood Johnson Foundation, one in eight Medicare patients was readmitted to the hospital within 30 days of being released after surgery in 2010.

“It’s clear we need to follow patients not just through the hospital process but through the postop period and beyond,” Dr Stead says. Of course, readmissions also hit the hospital’s bottom line in terms of lack of payment from Medicare and other insurers.

Dr Boudreaux adds that the PSH is well positioned to help hospitals meet the Institute for Healthcare Improvement’s Triple Aim—improving the individual experience of care, improving the health of populations, and reducing per-capita costs of care. (Read more about the Triple Aim Initiative at http://www.ihi.org/engage/initiatives/TripleAim/Pages/default.aspx.)

Improving the patient experience is certainly one of the forces driving the PSH. “We’ve developed tremendous technology to take care of patients, but at the same time we’ve gone through increasing specialization, so what’s lacking with our surgical care is continuity,” Dr Stead says. “What we want to see is a great outcome for the patient, and we want to see care delivered at a cost level that is less than is currently happening—principally by making sure patients get the right care the first time.”

Benefits of the PSH
A 2014 literature review from Texas A&M University, College Station, for the ASA cited several benefits of the PSH model, notably reduced length of stay and readmission rates. Other benefits that contributed to these and other positive outcomes include:

- less unnecessary preoperative testing
- fewer delays in procedures
- reduced rate of surgical cancellations
- early resolution of medical issues
- greater use of enhanced recovery after surgery initiatives
- reduced postoperative complications.

“The real key here is the benefits for the patient,” Dr Stead says. “Patients get a single point of contact for all their questions and their continuum of care; they get coordinated care, which we believe will increase safety; they’ll have the shortest necessary stay in the hospital with the least risk of complications; they won’t have unnecessary testing; the patient and family will be more engaged because it’s much more focused on them; and they’ll know what to prepare for and expect.”

The PSH has market benefits, too. “Where it [PSH] has been successfully implemented, we are already seeing hospitals, surgeons, and physicians using this as an advertisement for better care and to differentiate their programs from others in the region,” Dr Stead says.

Payment challenges
Despite the benefits, hospital leaders need to know that PSHs take a significant time investment to start up. While “proof of concept models” can be done with existing staff, scaling up the PSH throughout the hospital results in the need for further investment, according to Zeev Kain, MD, MBA, professor and chair at the University of California, Irvine (UCI).

It may be necessary to add staff, and some services may not be reimbursed, so the financial impact of the PSH is concerning. The personnel needed differs based on the stage of implementation of the PSH, with project managers and Lean experts needed during the design and rollout of the PSH and healthcare extenders during the ongoing operations phase.

Dr Kain is in charge of the PSH at UCI, one of the first in the na-
tion to demonstrate the effectiveness of the concept. At UC Irvine Health, the clinical, medical education, and research enterprises of UCI, the PSH was first implemented with patients undergoing joint replacement surgery and later extended to other surgical lines such as spine surgery, cystectomy, and nephrectomy. Initial published results from UCI show significant reduction in length of stay, a very low readmission rate, and a very low complications rate.

Like UC Irvine Health, Advocate Lutheran General Hospital, Park Ridge, Illinois, chose to hire a project manager. “That was the biggest financial investment,” says David Young, MD, an anesthesiologist and medical director of presurgical testing at Advocate Lutheran and a partner in Surgical Directions, a consulting firm in Chicago. Dr Young is part of the leadership team for the PSH project currently in development.

“The surgical home has yet to be monetized,” Dr Kain says, “but we have shown significant reduction in length of stay, an increase in patient satisfaction, and fewer costs.”

Although some systems such as Kaiser and university-affiliated hospitals have made inroads, reimbursement remains a concern. Dr Stead is optimistic that as payers see the benefits of the PSH, payment will improve, noting that the PSH model is well suited for bundled payment.

“If you look at episode of care payment, this is what a surgical home is,” Dr Stead says. “We envision it as a single payment for all the care that’s needed by all providers (including the hospital) for the episode, with some warranty for complications.”

Currently the Centers for Medicare & Medicaid Services’ (CMS) payment is the same for all patients, but the ASA is pushing for payment to be risk adjusted.

“If you’re a tertiary care medical center doing high-risk patients with ejection fractions of 15%, then your PSH payment for your cardiac patients is going to have to be different from a community hospital that is doing healthy patients,” Dr Stead says. Based on conversations with CMS, he says, “They understand the need for risk adjustment, and I think it’s something that we will be seeing coming down the pike.”

For example, CMS is currently piloting a program that packages payment around a comprehensive episode of medical care that covers all patient services related to a single illness or condition. The PROMETHEUS™ (Provider Payment Reform for Outcomes, Margins, Evidence, Transparency, Hassle reduction, Excellence, Understandability, and Sustainability) Payment Model generates an evidence-informed case rate that is adjusted for the severity and complexity of each patient’s condition. Costs are based on two types of risks—those outside the provider’s control and those within the provider’s control.

The good news is that hospitals can reap cost-saving benefits. “Hospitals can save money because of shorter lengths of stay, fewer postop complications, and standardization in the OR,” Dr Kain says.

Like Dr Stead, he sees the appeal of the PSH to third party payers because about half of the costs following joint replacement surgery are attributable to postdischarge needs. “The cost for the surgical home pays off on the back end,” Dr Young says, noting that managing problems such as pain, delirium, and postoperative nausea and vomiting has a high cost for the hospital. “It provides a good return on investment.”

Leadership and structure
Anesthesiologists head up most PSHs with support from a multidisciplinary team that includes surgeons, nurses, and representatives from a wide range of stakeholders. “Anesthesiologists are exceptionally well positioned to lead surgical homes,” Dr Stead says. “We are frequently the physicians who see the patient preoperatively and make the determination if he or she is really prepared for the surgery, we’re the physicians present during the case who take care of the patient in the OR, and we’re frequently brought in for issues in the hospital postoperatively.”

He notes that anesthesiologists are involved in many aspects of patient care that affect outcomes, from the choice of anesthetic to management of pain and glucose levels.

There has been some push back from surgeons on anesthesia-led
The surgeons believe they have a lot of the skills you need for a surgical home,” Dr Stead says. “They want it to be physician run, and we completely agree with that.”

The ASA has established a joint work group on the PSH with the American College of Surgeons and is developing similar relationships with other physician specialties as well as the American Hospital Association.

Hospitals have taken different approaches to building a PSH. Some, like UC Irvine Health, have built the home starting with one service line and expanding to additional ones.

Others, like UAB, take a more broad-based approach or, like Advocate Lutheran, work with individual surgeons who support the concept. A total of 44 hospitals are participating in the ASA’s Learning Collaborative (sidebar, p 11).

“You have to be naïve to think you can take a plan like this and start with an entire hospital,” Dr Kain says. “You have to start with one surgeon so you can see that you are saving money and patients are satisfied, and then you can gain buy-in from services and can expand. We are doing it very carefully, service line by service line.”

The hospital started with total joint replacement as a proof of concept, and then added cystectomies, nephrectomies, spine, shoulder procedures, and neurosurgery.

“The biggest benefit of this model will be elective procedures that we can plan for and optimize the patient for, and we can reduce variability,” Dr Kain says. He is unsure if the PSH model could be used for urgent procedures or general surgery. “We have to appreciate that some service lines, like orthopedics and urology, are more natural fit for this approach,” he adds.

The key is for hospitals to structure the PSH so it’s congruent with the concept while still meeting the hospital’s individual needs. Dr Young says the team at Advocate Lutheran decided to spread out the workload by distributing responsibilities.

“We broke down everything into testing, preoperative, intraoperative, and postoperative phases,” he says. “Each element is being managed by a different anesthesiologist.”

OR leaders play an important role in building and sustaining the PSH. “They are incredibly important in the process of team-

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**Perioperative surgical home overview**

*The figure below illustrates processes and participants in a typical surgical home.*

In the PSH model, the patient’s experience of care is coordinated by a director of perioperative services, additional surgical home leadership and supportive personnel, which constitutes an interdisciplinary team. The expected metrics include improved operational efficiencies, decreased resource utilization, a reduction in length of stay and readmission, and a decrease in complications and mortality – resulting in a better patient experience of care.

*Figure developed by Daniel J. Cole, M.D.

Source: American Society of Anesthesiologists. Used with permission.
work and care coordination,” Dr Boudreaux says.

**Gearing up**
Dr Stead and others point to three key elements for implementing a successful PSH:
- buy-in from the C-suite
- buy-in from physicians, especially surgeons
- buy-in from patients.

**C-suite buy-in**
“You need C-suite support to pay for the surgical home and to motivate the necessary people to come to the table,” Dr Young says. To present the program to C-suite staff, he used a template available from the ASA, included basic metrics showing benefit, and provided reading material supporting the concept.

“To have continued support, you have to show effectiveness,” he says, citing the standard formula that value equals quality divided by costs. “A surgical home ensures a hospital provides high-value care to patients and payers,” he adds.

“Once we showed success in one service line,” says Dr Kain, “there was a buy-in from the organization to continue the initiative throughout other surgical services.” There are now PSH models in orthopedics, urology, and neurosurgery.

**Physician buy-in**
To help get surgeons on board, Dr Kain says, “They have to understand there is a need. If you talk about optimizing patients and postop management, surgeons won’t argue with you; they always want to do the right thing.”

Strategies include gain sharing and explaining how the move to bundled payments makes the PSH in a surgeon’s best interest.

Physician buy-in can affect how a hospital launches the PSH. For instance, surgeon support and patient volume led Advocate Lutheran to start with the gastrointestinal service.

**Patient buy-in**
A PSH thrives by being patient centered. “Patients need to understand that they are getting a point of contact that is going to be consistent throughout their care,” Dr Stead says. Dr Boudreaux adds that it’s important to set and meet patient expectations. For example, the anesthesiologist lets patients know that the analgesia block they receive after surgery will reduce pain, not eliminate it.

“We go to great lengths to set appropriate expectations and meet those expectations.”

**The bottom line**
Although the PSH is now focused on adults having in-hospital surgical procedures, Dr Stead says that some in the ASA Learning Collaborative plan to adopt the model for ambulatory surgery centers. In fact, UC Irvine Health is experimenting with an outpatient orthopedics PSH. There have also been calls to apply the model to the pediatric population. And, Dr Stead adds, there is no “litmus test” as far as the size of facility that can implement a PSH.

“Our goal is to get patients transitioned back to the primary care provider and returned to function,” Dr Stead says. “It’s clear that a successfully done surgical home offers such advantages to the patient in terms of outcome and cost that it is going to be something that everyone will want to participate in.”

Cynthia Saver, MS, RN, is president of CLS Development, Inc., Columbia, MO.
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References


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Stay competitive
“I think we’re at the point that you need a hybrid OR to be competitive,” says Deborah Rideout, BSN, RN, CNOR, director of perioperative services at Southcoast Hospitals Group in New Bedford, Massachusetts. The first hybrid OR in this four-facility system opened in New Bedford in 2008, and another one is being built at their Fall River site. About 230 cases per year on average are performed at the New Bedford site.

Rohit Inamdar, MSc, DABR, senior medical physicist at ECRI Institute, agrees with Rideout. “Even if you are a small facility, minimally invasive surgery is here to stay, so if you don’t get on board with a hybrid OR or cath lab, you will be left behind,” says Inamdar, who has consulted with many hospitals developing hybrid rooms. “You need a hybrid OR to keep your cardiac surgery program.”

Hybrid ORs are most common in academic medical centers, but a growing number are being installed in community hospitals. How can OR managers build a business case that provides a reasonable return on investment? Inamdar says program, staffing, and patients form a three-legged stool that supports the business case for a hybrid OR (sidebar, p 14).

Ensure a robust program
Inamdar recommends that anyone considering a hybrid OR first determine if the facility has a robust open-heart surgery program for valve replacement, given that currently the primary procedures performed in the hybrid OR are transcatheter aortic and mitral valve replacement (TAVR, TMVR).

OR managers should also consider other potential future uses of the hybrid OR. At Inova Fairfax in Falls Church, Virginia, for example, the endovascular hybrid OR began as a location for TAVR, but has since expanded to include endovascular aneurysm repair, says Anne Cochrane, MSN, RN, CNOR, interim director of the cardiovascular OR. “You want to set up the room so it can be used for anticipated future procedures.”

Planned future use also affects design and equipment needs. For instance, Ingle says, “Some neurosurgeons want a biplane [angiograph imaging system], but endovascular surgeons use a single plane, and some neurosurgeons are OK with a single plane and don’t need a biplane.” These decisions will affect costs.

The geographic location of the hybrid room affects the bottom line. “CMS [Centers for Medicare & Medicaid Services] says you have to do TAVR in a hybrid room to receive reimbursement,” Inamdar says. CMS lists additional qualifications needed for reimbursement, including volume requirements. Third-party payers are also providing incremental reimbursement for TAVR. In 2014, CMS approved a technology add-on payment to cover TMVR.

To support the hybrid OR, the program must be supported by a good relationship with primary care physicians who will refer patients. “If you have good vascular surgeons but don’t have any primary care alliance, you could find yourself with an empty room,” Rideout says.

Get support from experts
“You should have cardiac surgeons who have experience and expertise with TAVR because...
these patients are considered high risk,” Inamdar says.

For hospitals without TAVR experience, CMS requires cardiovascular surgeons to have performed at least 100 career aortic valve replacements (AVRs), including 10 high-risk patients, or at least 25 AVRs in 1 year, or at least 50 AVRs in 2 years, which include at least 20 AVRs in the last year before TAVR initiation. Hospitals may need to recruit cardiovascular surgeons or interventional cardiologists to meet these numbers.

Surgeons need to maintain volume to ensure continued reimbursement. CMS requires the surgeon and hospital to complete at least 20 TAVR procedures in a year, or at least 40 TAVR procedures in 2 years. The agency also has volume requirements for interventional cardiologists and the hospital’s cardiac catheterization lab.

In addition to physicians, CMS lists other members who must be part of the team, including echocardiographers, imaging specialists, heart failure specialists, cardiac anesthesiologists, intensivists, nurses, and social workers.

Above all, says Ingle, “The most critical part is having physician champion.”

**Identify eligible patients**

To analyze potential patient volume, Rideout suggests asking, “What is the market share that we aren’t getting because we don’t

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**Creating the business plan**

Writing a business plan isn’t done in isolation, says Deborah Rideout, BSN, RN, CNOR, director of perioperative services at Southcoast Hospitals Group in New Bedford, Massachusetts. “It takes a team to collect the information you need and put it into one packet.”

The team should include surgeons and staff from business, finance, engineering, imaging, and biomedical, among others. Typically the plan projects breaking even at 5 years.

“Sales reps can be helpful in identifying break-even points,” says Anne Cochrane, MSN, RN, CNOR, interim director of the cardiovascular OR at Inova Fairfax in Falls Church, Virginia.

Elements to consider when writing the plan include:

- **Market intelligence.** Rideout suggests answering questions like, Who else in the region has a hybrid OR? Where are they drawing the patients from?

- **Market share.** Estimate what market share the hospital is losing because of not having a hybrid OR and whether the hospital has strong enough referral relationships.

- **Patient-related data.** This includes payer mix and expected volume, including what percent of current cases will be converted into hybrid cases. Forecast predicted reimbursement based on payer mix and note savings from reduced length of stay.

- **Construction.** Consider if you can upgrade an existing OR or if you need to create a new one, keeping in mind that a hybrid OR averages 1,100 square feet, compared to 600 square feet for a standard OR.

- **Equipment.** To avoid missing something, meet with hybrid team members, including surgeons and radiology staff, as well as vendors. Ask vendors for names of hospitals to call, and go on site visits. Use a bidding process to obtain the best price.

- **Upgrades.** “It’s best to plan for software and hardware upgrades on a rolling basis 5 to 10 years out so you have a good idea as to future capital expenses,” Cochrane says. “It’s not just the expenses up front.” The finance department can help with depreciation estimates, and the sales representative would be able to provide upgrade time frames.

- **Supplies.** The cost of implants such as those used in TAVR are significantly higher than the grafts used in an open procedure, so the plan will need to include expenditures for stock. “Until you are doing the program for about a year, you have to purchase the implants instead of buying on consignment,” Cochrane says. She adds that it’s key to work with the finance department to ensure supplies are billed; some hospitals have set up a line item for a hybrid procedure.

- **Timeline.** Lynne Ingle, MHA, BS, RN, CNOR, recommends targeting no more than 6 months for making the decision as to what system to select. “It gives you time to make site visits and get people in agreement, but not so much time that you lose momentum,” says Ingle, project manager for Gene Burton & Associates, a healthcare technology consulting company in Franklin, Tennessee, and a former director of surgical services.

Cochrane also recommends working with finance to determine allocation of revenue and supply charges. For example, if a cardiologist and a surgeon are doing a case, who receives credit? Also, block scheduling is necessary for efficient operation of the hybrid OR.
Technology

have a hybrid OR?” It’s helpful to list cases that will be done immediately in the hybrid OR and those that will be added later.

“Look at the length of stay for those patients, and work with your business partners in the organization to calculate what the savings would be if those patients could be discharged sooner,” she adds.

Cochrane says the surgeons are good predictors of volume: “They really know their market and where their referral base is.”

A limited number of procedures currently require a hybrid OR. “There can be a positive profit margin with TAVR, but it’s very small,” Inamdar says. Only a small number of patients are eligible for the procedure, and those who are eligible are also high risk.

“The national TAVR pool is about 20,000 to 30,000 in the entire US,” Inamdar notes.

Reimbursement for the procedure from CMS ranges from $27,000 to $56,000, depending on the patient’s severity and how he or she is treated. Considering that the TAVR valve costs just over $30,000 and that the procedure cost ranges from $50,000 to $80,000, it’s clear that a hybrid OR “is not a money-making machine,” Inamdar says.

“If you’re armed with talented physicians who are aligned with you, have a solid cardiovascular program, and a market share that is validated to be leaving the area because you’re not offering certain services—that’s a good case for a hybrid OR,” says Rideout.

Make the numbers work

Because of the expense, it’s not easy to make the numbers work for a hybrid OR. “But because it [a hybrid OR] has become a standard, you have to find ways of being fiscally prudent while you’re doing it,” Rideout says.

One way of saving money is to choose vendors wisely, Ingle says. If, for instance, the cath lab is using equipment from Toshiba, you might be able to obtain a discount by purchasing Toshiba equipment for the hybrid OR.

If your cardiac surgery program isn’t large enough for a hybrid OR, Inamdar suggests considering a hybrid cath lab or adding a hybrid interventional radiology suite. The downside is that these rooms still require the staff, supplies, and sterility needed in the OR. “But it’s doable and it’s a lower price option,” he says.

Ingle adds, “My philosophy is that it should be behind the red line of the OR in case you have to open the patient, but I’ve seen it done both ways. It’s something hospitals have to discuss.” She notes that remodeling an existing OR is less expensive than building a new one.

To maximize the use of the hybrid OR, Inamdar recommends OR managers work with other physicians such as vascular surgeons, neurosurgeons, and electrophysiologists, who use angiography imaging systems. “You might be able to consolidate so you need fewer labs and improve your financial equation a bit,” Inamdar says.

Keep in mind that when not in use for its hybrid capabilities, the OR can be used for certain other cases. At Inova, for instance, “the hybrid OR is built so it can be used for any patient who requires a bypass pump,” Cochrane says.

Ingle says that at many hospitals, hybrid ORs are being used for spinal and total joint replacement surgery, as well as other cardiovascular procedures, as physicians increasingly tap into the value of good imaging for a variety of procedures.

Another option for reducing costs is to choose a refurbished angiography imaging system. Facilities that are downsizing or upgrading their systems may be trading in systems that are less than 5 years old.

Inamdar says the typical life span of these systems is 10 years, so facilities could save as much as $1 million by purchasing a refurbished model. “It will still meet your needs but won’t have all the bells and whistles,” he says. When exploring the refurbished option, be sure to work with a reputable vendor.

Envision the future

Inamdar notes that currently only one mitral valve contouring system is approved for use in the United States, but expects others currently being used in Europe to receive approval as well, further pushing demand for hybrid ORs. “Transcatheter devices are a growth area, and I don’t see it slowing down anytime soon,” he says.

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References


Medical device manufacturers have taken the first step in complying with the 7-year unique device identification (UDI) process mandated by the Food and Drug Administration (FDA).

The UDI system establishes a consistent way to label and track medical devices from production to use, and is intended to improve patient safety and cut costs associated with medical device labor and supplies. This first rule, which took effect in September 2014, states that labels and packages of Class III devices and devices licensed under the Public Health Service Act must bear a UDI.

“System allows fast tracking of device recalls.”

At Englewood Hospital and Medical Center, Trojkovich and her staff have begun to integrate the UDI system by using UDI Tracker® (Champion Medical Technologies, Lake Zurich, Illinois), a cloud-based medical device management system, to track implantable devices with UDI labels.

Trojkovich says that before they implemented this system, it took close to a month to manually track down and inform a patient about the recalled implanted device. Now, because the system tracks every device in the hospital’s inventory and every patient connected to that device, notification is immediate.

Trojkovich anticipates more UDI tracking systems will soon be on the market.

Cutting costs
The UDI system also is expected to help cut labor and supply costs by facilitating the tracking of devices as they move through the supply chain. Instead of returning entire batches of devices during a recall, as many hospitals now do, the UDI system will make it possible for hospitals to send back only the affected ones.

“She is also expected to help cut labor and supply costs by facilitating the tracking of devices as they move through the supply chain. Instead of returning entire batches of devices during a recall, as many hospitals now do, the UDI system will make it possible for hospitals to send back only the affected ones.”

Some of our products even today are labeled in a crazy way,” says Trojkovich. “We have pericardial patches that all have the same product number, but they don’t have an individual serial number attached to them. So if there is a recall, it’s not just one lot number or one serial number, it’s the entire product line that ends up being recalled.” With a unique identification system, hospitals will be able to pinpoint exactly which devices are recalled, which will translate into big savings.

The UDI system will also give hospitals much more control and insight into their inventory,” Peter Casady, chief executive officer of Champion Medical Technologies, told OR Manager. “Hospitals lose up to $5 billion every year due to expiring or missing medical device implants,” Casady says. “With a searchable medical device management system in place, hospital staff will be able to monitor expiration dates and recalled products in real time, helping them to reduce waste and improve patient safety.”

Laying a foundation
Although the benefits of the UDI system are clear, its implementation does not come without obstacles. Many hospitals are holding off on integrating the UDI system into an appropriate database because of the expense involved.

“If a hospital already has an electronic health record [EHR] in place, a lot of them [facility leaders] think that having this will suffice for traceability, so they try to integrate their EHR into a database,” Trojkovich notes.

She adds that going this route is cheaper for hospitals with an existing EHR system, so they are waiting to see if they can track devices this way.

However, integration between
the UDI system and EHR systems already in place in hospitals may take years to materialize, and if it does, it will not improve search capabilities. Trojkovich says, “That system really requires more time and effort to try to search through because it’s manual and it’s done by one person.”

Trojkovich also says that laying a foundation for the UDI database is important because of future technological advances. “It’s a good idea for hospitals to get an early start on this because it’s just going to get worse. We’re getting more and more products that are implantable, the technology is going crazy, and we get more and more new items that need to be tracked,” she says. “We’re in the business of saving lives and protecting people, so the faster we get on board with this, the better it is for our patients,” she adds.

Looking ahead
The next step of the 7-year UDI process, slated for September of this year, will require non-class III implantable, life-supporting, and life-sustaining devices to bear a UDI, and the UDI must be permanently marked on the device if it is intended to be used more than once and reprocessed before each use. Data must be submitted to the global unique device identification database (GUDID).

The UDI system, though years away from completion, presents many opportunities for hospitals to cut costs, standardize medical device tracking capabilities, and above all else improve patient safety, Trojkovich says. “To me, the safety of it outweighs everything.”

—Mai Hanoon

### Regulations

**UDI implementation timeline**

The unique device identification (UDI) system will be implemented over 7 years. The remaining rules go into effect on the following dates:

- **September 2015**—labels and packages of implantable, life-supporting, and life-sustaining devices must bear a UDI, and the UDI must be permanently marked on the device if it is intended to be used more than once and reprocessed before each use. Data must be submitted to the global unique device identification database (GUDID).
- **September 2016**—Class III devices with a UDI on the label and package must be permanently marked if intended to be used more than once and reprocessed before each use. Class II devices must bear a label. Data must be submitted to the GUDID.
- **September 2018**—Class II devices with a UDI on the label and package must be permanently marked if intended to be used more than once and reprocessed before each use. Class I devices must bear a label. Data must be submitted to the GUDID.
- **September 2020**—Class I and unclassified devices with a UDI on the label and package must be permanently marked if intended to be used more than once and reprocessed before each use.

**Reference**


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**Continuing Education**

OR Manager hosts webinars twice monthly to help nurses earn continuing education credits. Each presentation provides information and tools to improve operations and patient safety. See our webinar schedule at www.ormanager.com or contact Ellen Lord, MS, RN, CNOR, Webinar Coordinator, at zlord@ixnetcom.com to learn more.
Communication, collaboration, commitment are cornerstones of high reliability healthcare

Providing dependably excellent care for all patients all of the time is the essence of high reliability healthcare, as defined by the Joint Commission in its 2013 report. Two large health systems—Kaiser Permanente and Cincinnati Children’s Hospital—are on the path to becoming highly reliable organizations. In recent years, improved processes and communications have helped them decrease sentinel events. Nonetheless, leaders from both systems say more needs to be done.

“A highly reliable organization is an organization that has succeeded in avoiding catastrophes in an environment where normal accidents can be expected due to risk factors and complexity,” says Marie Paulson, MS, BSN, RN, CNOR, regional perioperative director for Kaiser Permanente’s Southern California Patient Care Services in Pasadena. Paulson and James DeFontes III, MD, assistant executive medical director, patient safety and perioperative services, spoke about their organization’s high reliability journey at the 2014 OR Manager Conference. About 250,000 procedures are performed annually in Kaiser’s 150 main ORs and 55 surgicenters, according to Dr DeFontes.

Cincinnati Children’s Hospital, an academic medical center with around 600 beds, began its high reliability journey about 10 years ago and is regarded as a leader in the movement. However, it’s an ongoing process, notes Stephen E. Muething, MD, associate professor and vice president for safety. “We do not believe we’re a high reliability organization,” Muething told OR Manager. “We believe we’re on the journey. We’ve dramatically improved on our ability to analyze and learn from events, and we’re very committed from the top to learn from and improve from any serious event.”

Borrowing from aviation
Kaiser Permanente is one of many healthcare organizations that have adopted safety practices from the airline industry.

In the early 2000s, Dr DeFontes said, the aviation industry partnered with experts from the University of Texas Center of Excellence for Patient Safety Research and Practice in Houston in an effort to shift from expert individuals to expert teams, break down silos, improve communication, and prevent errors.

“Reliable and timely reporting was the first thing they had to do,” he noted. “They had no reports, so they had to create a blame-free environment to get some reports, and it took 3 to 5 years to get any kind of meaningful information.”

Among the key lessons that informed the changes needed at Kaiser, according to Dr DeFontes, were:

- creating checklists and defining roles
- flattening the hierarchy to make everyone an equal member of the team
- using simulation-based education to prepare for emergencies
- creating a failure mode analysis
- hiring for effective leadership.

Creating a culture of safety
“We want to be the kind of organization that knows about harm in real time,” says Dr Muething. “If a patient or an employee is harmed in any way—be it a fall, bloodstream infection, pressure ulcer, or a bloodborne pathogen exposure for a staff member—that will be announced to the entire hospital tomorrow.”

Cincinnati Children’s belongs to the Children’s Hospitals Solutions for Patient Safety (SPS) learning network, a partnership between 80 children’s hospitals and the business community to improve quality of care and reduce healthcare costs.

Serious harm, as defined by SPS, includes:

- serious safety events
- surgical site infections
- ventilator-associated pneumonia
- bloodstream infections
- catheter-associated urinary tract infections
- adverse drug events (levels 6-9)
- pressure ulcers (grades 3-4)
- serious falls
- codes outside the ICU
- serious peripheral IV infiltrates.

At Cincinnati Children’s, a Safety Oversight Group composed of family advisors, senior leaders, and the CEO tracks progress toward meeting safety goals, Dr Muething says.

“The Safety Oversight Group comes from the belief in high reliability organizations that safety is owned by senior leadership. Certain things can be delegated, but safety cannot,” he says. The group meets monthly to discuss every serious safety event and report to the board. “If we have a serious safety event, I have to explain to the CEO what happened.”
Patient safety

He wants to know about it immediately, and he then calls the chairman of our board of trustees immediately and talks about it. That’s how our senior leadership takes responsibility,” Dr Muething explains.

In 2007, a Safety Coaching Program was launched to reinforce expected safety behaviors. Safety coaches are staff volunteers who are taught to observe their colleagues, give feedback, and complete behavior observation tools, which are part of an electronic log system.

“We laid out a group of very specific behaviors we expect everyone to practice,” Dr Muething says. Coaches give the staff feedback, and their goal is to provide positive feedback five times for every time they give constructive feedback.

Leaders of each clinical area are expected to interact with their safety coaches at least monthly. There’s also a monthly meeting of all safety coaches with positive feedback like “safety coach of the month” awards and discussion of how they can improve as safety coaches, Dr Muething says.

A key safety improvement at Kaiser Permanente has been to incorporate a Safety Attitudinal Questionnaire (SAQ) into the debriefing process. The SAQ was launched in 2002 to link outcomes with briefings, Dr DeFontes says.

Originally designed as a brief questionnaire for the perioperative services department, the SAQ now has about 150 questions and is administered hospital-wide every 2 years, according to Paulson.

Sample questions include:

• Do you feel safe in speaking up?
• Are you encouraged to bring safety issues forward?
• How comfortable are you in speaking up when you identify a safety concern?

The same kind of question is asked in multiple ways, Paulson explains, to discover where hierarchy might be preventing staff from speaking up. For example, physicians have indicated that they feel comfortable discussing a safety concern, whereas nurses have expressed difficulty doing so, and housekeepers have said they don’t feel comfortable at all.

Hierarchical issues are deep in healthcare, Dr Muething notes. “The preprocedural time-out or postprocedural debriefs are very safety critical, and hierarchy is often counterproductive. Often the person who’s lowest on the chain has a piece of crucial information, and if we don’t allow that person to add that information and value it, that can lead to problems.”

At his hospital, he says, team members address one another by their first names, and people are thanked for raising questions, regardless of whether or not they bring up an important point.

Educating staff

Senior and mid-level staff at Kaiser Permanente have benefited from attending the Patient Safety University, a 2.5-day program given at different regional locations in California. Training is provided twice yearly in safety culture, emotional intelligence, and psychological safety, Paulson says.

Attendance is mandatory for positions such as patient safety officers, risk managers, ombudsmen, quality directors, and perioperative services directors, according to Paulson, but even staff who aren’t required to go consider it an honor to be invited.

“We’ve established time-outs and verification processes, and we’ve put together videos and films. Every medical center has a refresher safety training every year,” Paulson says. “We have seen an impact on our hospitals and medical centers in that safety really is a focus every day—sentinel events have decreased.” A notable success story is the Kaiser Permanente West Los Angeles Medical Center, which has gone nearly 1,000 days without a never event (sidebar, p 20).

As a result of the Patient Safety University, one medical center established a policy of saying the words “safety check” as a signal for the OR team to stop talking and listen. “It may be a patient verification, it may be the counts are off, it may be the consent is wrong, it may be a lack of understanding about the medication order—but the point is, the team must stop and listen,” she explains. This practice has now been implemented in all perioperative areas in the southern California hospitals.

Surveys administered to Patient Safety University participants have gotten consistently positive responses, Paulson says. “People find new ways to interact; participants do team activities as equal partners, regardless of whether they are a surgeon, a nurse executive, or staff.”

Kaiser staff also take critical event team training (CETT), which covers topics such as malignant hypothermia, fires, and hemorrhage. A recent CETT taught perioperative staff how to keep themselves and their patients safe during an earthquake. This training was relevant to everyone, Paulson says, and it got

Continued on page 20
Facility bets on batting a thousand in patient safety

Perioperative services staff at the Kaiser Permanente West Los Angeles Medical Center are literally counting the days until April, when they expect to hit the 1,000-day mark without a sentinel event. They have been tracking this metric for about 5 years, and they keep patient safety uppermost in everyone’s minds by displaying a poster with the number of days since the last sentinel event. The poster, located in a main corridor of the perioperative services area, is updated daily.

“There is a saying that ‘what gets measured gets done.’ We wanted to have a simple measure that we could report to staff and surgeons that demonstrates our commitment to safety and teamwork,” Victoria Coon, perioperative director, told OR Manager. “We chose to focus on the number of days since our last never event because it’s an easy and effective metric to track, understand, and communicate to our hospital staff and physicians.”

“Collaboration is an important part of our mission and everyday work,” Coon notes. “Some of the practices that have led to our success in preventing never events have been shared and adopted by other facilities.”

Workplace safety is also a priority, and they post the number of days since the last on-the-job injury experienced by any employee or physician.

“Patient safety requires a multipronged approach,” notes Scott Lisbin, surgical service line leader. Other key elements of the patient safety program that have helped hardwire the behaviors needed to avoid never events, according to Lisbin, include:

- a comprehensive safety orientation for all new employees, physicians, and residents
- a dedicated and enthusiastic safety champion
- understanding and learning from near misses and disseminating what is learned to all surgeons and staff
- recognition of staff who speak out about safety concerns and “stop the line” when they have any safety concerns
- strong briefings and time outs
- providing assertiveness training for staff
- daily reminders in huddles about patient safety opportunities
- daily rounding and observation of practices and behaviors in the OR
- annual human factors training for the entire perioperative staff and physicians
- standardization of language for safety concerns; saying “I need a safety check.”
- Critical event team training.

Outside the OR, the Kaiser Permanente West Los Angeles Medical Center has adopted a reward and recognition program to raise patient safety awareness. Recipients of the “Near Miss/Good Catch” award are recognized among their peers and leadership team as patient safety champions. These individuals receive a special certificate, and several staff from perioperative services and the anesthesia department have also been recognized as part of this program.

A big celebration and lunch are planned to mark day 1,000 without a never event, Lisbin says.
selves. We’ve had to teach people how to present an event and how to work in an RCA,” Dr DeFontes says.

Leaders at Kaiser Permanente have increased huddles from once a day to twice a day in an effort to involve more staff and gather more information, Paulson says. “We talk about what happened yesterday and how might we improve, what’s going on today, and how to plan for tomorrow.”

As for errors, a safety algorithm has been created to help reveal the cause of errors, ie, whether they’re the result of factors such as poor education, a system failure, or risky behavior. “As we’re tracking events, we’re identifying common themes,” she says.

“It’s almost as if you’re studying the same road accident a year later and thinking, ‘What did we learn from that accident?’” Dr DeFontes notes.

“If you don’t want to have to revisit this at least yearly, it goes by the wayside. That constant learning and training and getting groups together is very important,” she adds.

Evolving from a conservative, risk-averse organization to one that embraces rapid and open communication has come about through culture change, Dr Muething says. Over time, staff have learned that safety is everyone’s responsibility. “You have to build the trust, the belief that leaders care about it, and the systems to communicate the information into the daily workflow, and leaders have to value that information. Changing culture is a ‘forever’ journey; you never stop,” he says.

—Elizabeth Wood

References

Marie Paulson will be a presenter at the OR Manager Conference, October 7-9, in Nashville. Visit www.ormanagerconference.com.

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**Patient safety**

- Leaders at Kaiser Permanente have increased huddles from once a day to twice a day in an effort to involve more staff and gather more information.
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**SCAL Highly Reliable Surgical Team (HRST) “TIME OUT” & Safety Process**

- **“Time Out”** is conducted using a briefing process.
- Confirm **Circulator**:
  - Confirms all Surgical Team member names on White Board.
  - All STAFF INTRODUCED, PRESENT and ENGAGED.
  - White Board includes all Elements: Patient Name, Surgical Procedure, Site and Side (MR# Optional).

- **Circulator**:
  - Confirm Patient’s name / MR# / Correct Procedure (consent).
  - Verify and confirm site and side of procedure with site marking identified by surgeon’s initials, approach, time, and anticipated difficulties.
  - Special equipment and instruments needed, staff familiar with use.
  - Identify need to administer antibiotics.

- **Anesthesia**:
  - Allergies.
  - Anesthesia plan.
  - Surgery procedures based on history and medication use.
  - POST-OP PLAN.
  - Post-op Pain Plan.
  - Post-op Airway Management Plan.

- **Scrub**:
  - Instruments available.
  - Sterility of instruments are verified and confirmed.
  - Special equipment/supplies are confirmed.
  - All meds / irrigations / solutions, basins, and syringes are labeled.
  - 1st Count completed prior to incision.

- **Surgeon**:
  - Correct implant(s) available.
  - Confirm specimen and labeling.
  - Mechanical SCD / TED hose (as necessary).
  - Blood available, confirmed.
  - Specific implant named & confirmed.
  - X-Ray Images available.
  - Specimen and Pathology.

- **Additional Checklists**:
  - Verification of all Elements in **RED**.
  - The Safest Place to Have Surgery.
  - The completed components of the Universal Protocol and Time Out Process are clearly documented in Op-Time.

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Checklists like this are used in the ORs at Kaiser Permanente and can be customized for different surgical procedures. Reprinted with permission from Kaiser Permanente Southern California Patient Care Services, Pasadena, California.
Turnover time is a major concern for OR leaders. We surveyed OR Manager readers last year to identify the business and efficiency issues they want to know more about. Reducing turnover times ranked second, just under cost control.

Extended turnovers clearly affect labor costs, but they also have a strong impact on surgeon satisfaction. And depending on the specialty, long turnovers can effectively shrink OR capacity and reduce profitability.

Reducing average turnover time is a complex challenge that calls for multidisciplinary collaboration. Many people contribute to the problem of inefficient turnover, so all OR stakeholders must work together to solve it. Six strategies are effective:

1. Capture the current state
The first step to improving turnover processes. Alecia Torrance, senior vice president of clinical operations at Surgical Directions, a consulting firm in Chicago, worked recently with an East Coast specialty hospital where the average turnover time was 40 minutes.

“Our first step was to get all the key stakeholders together in a room, including nurses, techs, anesthesia providers, and others,” Torrance says. “We asked them to describe the current turnover workflow. That helped us create a ‘current state map’ of the process. We then got special permission to videotape the turnover process.”

Three surgeons volunteered to have their turnovers recorded for an entire day. A videographer captured all activity from the time a gurney was wheeled out of the room until the arrival of the next patient.

Later, the group reconvened to review the video. “People were shocked when they saw how uncoordinated the turnovers actually were,” Torrance says. “It was remarkable but also kind of funny. Everyone laughed as they watched the same table get cleaned three different times during a single turnover.”

The value of the exercise was that it let everyone see that the process was broken. Staff then collaborated to define and map out a well-orchestrated turnover process. After months of work, the department succeeded in reducing average turnover time to 23 minutes.

2. Create parallel processes
One common problem is that many turnover tasks are performed sequentially. To reduce turnover time, staff should take advantage of opportunities to perform steps in a parallel fashion. Appropriately “stacking” processes helps shorten the entire turnover. Here are a few examples:

Breakdown/cleanup. In many ORs, staff do not begin cleaning the room until the patient has exited. But from an infection control standpoint, many cleanup tasks can begin as soon as the dressing is on. For example, staff can remove trash, send unneeded instruments to sterile processing, and begin cleaning equipment.

Setup. Often OR staff do not begin preparing supplies until the patient is in the room. Supply setup can actually begin much earlier. Immediately after the room is clean, the circulating nurse can lay out supplies and begin opening sterile packs. Once the back table is set up, the surgical technologist can begin the preoperative count and the circulating nurse can complete his or her assessment of the next patient.

Anesthesia processes. Anesthesia teams can also perform more tasks in parallel. For example, 20 minutes before the end of one case, the anesthesiologist can place the line or administer a block for the next case.

3. Define swim lanes
Another problem in many ORs is that turnover responsibilities are poorly defined. Recall the “triple-washed” table mentioned above. Things like this happen because turnover task assignments are not clear. The results are redundancy, wasted effort, and extended turnover.

The solution is to establish “swim lanes” for all staff. A swim lane is a distinct set of tasks belonging to an individual team member. With well-defined swim lanes, the activities of nurses, surgical technologists, certified registered nurse anesthetists (CRNAs), and other staff can be streamlined.

For example, when the patient exits the operating suite, staff roles sometimes become hazy. Individual staff members may take up tasks according to convenience or preference. Cleanup proceeds...
slowly because no one is responsible for a dedicated series of tasks. In contrast, effective swim lanes for the minutes following patient exit could include:
• Surgical technologist—move instruments to the contamination area for reprocessing
• Float nurse—bag trash and linens
• Orderly/CRNA—mop floors and wipe lateral surfaces.

Defining responsibilities in detail allows staff members to perform tasks immediately and efficiently.

The swim lane concept does not mean turnover roles should be defined rigidly. In many cases, staff must be willing to take on tasks outside their traditional job descriptions.

“In some ORs, staff won’t begin the turnover until someone from environmental services takes out the trash,” says Yvette Stanley, project manager at Surgical Directions. “They were trained that removing trash wasn’t part of their job, and they may have been doing it that way for 15 years.”

Work with staff to examine turnover processes and look for teamwork opportunities. Changing attitudes about traditional roles can be difficult, but effective OR leaders can succeed by helping staff take pride in their efficiency and trust that the tasks are being performed per the prescribed methodology.

4. Build in proactive thinking
Many turnover plans do not take advantage of opportunities to “stay ahead of the curve.” Train staff to anticipate the process, not just react to problems and needs.

For example, staff members can initiate many turnover steps a full hour before the end of a procedure. When a procedure is approximately halfway completed, the circulating nurse can notify the charge nurse that a bed will be needed and also call for the next patient. The orderly or CRNA can check the case cart and identify any additional equipment needed for the next procedure. The anesthesia technologist can also begin readying supplies for the next case.

Many turnovers are extended simply because a gurney is not present when the patient is ready to exit the room. A little bit of proactive thinking resolves the problem. Train orderlies to retrieve a gurney 5 minutes before case completion.

5. Keep the circulator in the room
In most ORs, the circulating nurse is responsible for transporting patients from the preoperative holding area to the surgical suite. This allows the circulator to build rapport with the patient and assuage any patient concerns en route to the OR, but it also pulls the circulating nurse away from the OR during cleanup and setup, often leaving the scrub technologist to turn over the room. The circulator is absent precisely when he or she is most needed to manage an efficient turnover.

A better approach is to have the anesthesia provider and an orderly transport patients from the preoperative holding area to the OR. This allows the circulating nurse to stay in the room and facilitate turnover.

The anesthesiologist or CRNA is usually the last person to evaluate the patient in the preoperative holding area, making this an efficient solution. In addition, the anesthesia provider can answer any questions the patient may have during transport.

Similar inefficiencies occur during transport of patients from the OR to the postanesthesia care unit (PACU). In many hospitals, the circulating nurse accompanies patients to the PACU, which means time is spent walking back and forth instead of leading the room turnover.

One alternative is to have the anesthesia provider transport the patient to the PACU, deliver the report, and then proceed directly to the holding area to complete the assessment of the next patient.

A second alternative is to have a PACU nurse come to the OR to retrieve patients. In most hospitals, PACU nurses have ample downtime. When available, a nurse can come from the PACU, receive the report from the circulating nurse, and then transport the patient back to the PACU along with the anesthesia provider.

A third alternative is to create a multi-utility role that combines functions to optimize productivity and efficiency. For example, transport, housekeeping, and operating room technician functions might be combined into one position.

6. Strengthen communication
“Communication is a huge aspect of efficient turnover,” says Barbara McClenathan, senior nurse executive at Surgical Directions. “Turnover processes cannot be well orchestrated un-
less all team members have real-time information.”

Key points include:

**Instruments.** “Say a vendor representative brings in two instrument trays for a surgeon who has scheduled three total hip replacements,” McClenathan says. “The tray used during the first case must be processed in time to allow the third case to begin promptly.” OR staff need to stay in close contact with sterile processing staff in order to manage this tight turnaround.

**Equipment.** Delays in locating and moving C-arm systems, laparoscopic video towers, surgical microscopes, and other equipment can lead to extended turnovers. Staff must inform other team members when a room is clean so any needed equipment can be brought in promptly.

**Patient readiness.** Turnovers run long when there are delays in preoperative medical orders or laboratory tests. In-room staff must communicate with the preoperative holding area to make sure patients will be ready when their room is ready.

For example, when a surgeon begins to close an ophthalmology case, OR staff should send an update to the preoperative holding area team so that they can then administer eye anesthetic and dilating agents to the next patient.

It is important to use an effective communication system. “Many ORs still use telephones to communicate, but this can be inefficient,” McClenathan says. “You may need to make five or six different calls just to coordinate the next patient.” Tracker boards offer efficiencies, but many ORs are not using them to their full potential. “Sometimes boards are installed in only one or two locations,” she notes.

Some ORs have begun using communication systems accessible by smartphone or tablet. McClenathan believes voice solutions are still effective: “Some of the newer software-driven solutions integrate voice, smartphone, and tracker capabilities.”

**Measuring and monitoring turnover**

The keys to any improvement effort are to measure the objective and to monitor performance consistently.

When working to improve turnover times, begin by establishing the current performance baseline. The primary turnover efficiency metric is “wheels out to wheels in” time. An additional metric for measuring turnover performance is “close to cut” time.

Once you have established baseline measures, monitor ongoing performance and post data where it can be seen by physicians and staff.

The Hawthorne effect—also known as the “observer effect”—will yield a net benefit over and above any process improvements. When team members know their performance is being observed through data monitoring, they will execute turnovers more efficiently.

**Multiple benefits**

Reducing turnover times can significantly improve surgeon and patient satisfaction. Improving time efficiency can also increase department capacity so that more cases can be accommodated without increasing indirect costs.

This column is written by the perioperative services experts at Surgical Directions (www.surgicaldirections.com) to offer advice on how to grow revenue, control costs, and increase department profitability.
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Using the right type of water for instrument reprocessing can prolong the life of medical instrumentation, contribute to effective function, and—most importantly—minimize the risk of adverse patient outcomes from contamination.

The water quality requirement for various stages of instrument reprocessing depends on the type of instrument and the disinfection or sterilization process used. For example, water quality criteria for reprocessing stainless steel general surgical instruments that will be steam sterilized are different from those for eye instrumentation or for reprocessing flexible endoscopes, which require high-level disinfection or low-temperature sterilization.

The importance of water quality for proper cleaning cannot be overstated. If a detergent is inactivated by poor water quality, cleaning will be inadequate and residual debris may impede mechanical movement of the instrument. Salt or other water deposits left on an instrument may cause corrosion, and the instrument may break during surgery when force is applied to it. Salts or organic deposits can also inactivate the disinfectant or sterilant, leaving behind some microorganisms. As a result, a device that’s thought to be sterile could transmit an infection.

Toxic effects and tissue irritation are another concern. Water with high microbial levels may contain high levels of residual endotoxins or other pyrogenic agents. If ethylene oxide (EO) is used to sterilize an instrument, residual salts from the water used for the final rinse could be converted by the EO to toxic residues. Usually remove organics, viruses, or bacteria, except through “accidental” trapping in the resin. DI water can be of very high quality with respect to ionized contaminants, but non-ionized substances such as bacteria and bacterial endotoxins are not removed, so DI should always be followed by filtration.

- Water treatment using reverse osmosis (RO) consists of a membrane separation process for purifying water that is based on molecular sieving and ionic rejection. This process removes ions and dissolved organic contaminants with molecular weights above 100. RO removes most ionic species as well as microorganisms, endotoxins, organic compounds, and colloids.
- Distilled water is produced by the vaporization and condensation of water to remove dissolved and suspended substances such as microorganisms, endotoxins, organic compounds, and colloids. Water distillation is a very slow process that requires a storage tank.

Problems associated with poor water quality

Bacterial endotoxins, total organic carbon (TOC), pH, water hardness, and ionic contaminants are among the characteristics that contribute to unacceptable levels of organic and inorganic components in water.

Individually or in combination, these characteristics can cause changes in the appearance or color of water. If the water used in reprocessing does not look clear and colorless, it should not be used for instrument processing until the problem is corrected.

These contaminants can cause
adverse reactions such as toxic anterior segment syndrome, an inflammatory reaction in the eye that can lead to permanent loss of vision after cataract surgery. Therefore, most manufacturers of ophthalmic surgical instruments recommend thoroughly rinsing these instruments with critical water. Other risks from poor water quality include:

- If disinfection or sterilization processes do not remove bacterial endotoxins, these residues will remain on reprocessed devices and can cause a pyrogenic (fever-like) reaction and other adverse effects.
- Water with TOC contains material from organic pollutants such as microorganisms, plants, animals, or pesticides. Water with a high TOC level can discolor the instrument and interfere with the effectiveness of detergents, disinfectants, or sterilants.
- The alkalinity or acidity level (pH) of water can cause pitting or corrosion of instrumentation. The pH can also have an effect on the cleaning solution if the water pH is not compatible with the detergents.
- Tap water is classified as “hard” if it has a calcium carbonate content higher than 150 ppm. Hard-water deposits left on instruments during reprocessing can affect the cleaning efficacy of detergents and automated cleaning equipment.
- Ionic contaminants in water can corrode instrumentation. Water should not increase the bioburden on the instrument. However, water can have high microbial levels, and those levels can vary throughout the year. The level of microorganisms in water depends on the effectiveness of the municipal treatment process and on the condition of the water distribution system.

Water is chlorinated to prevent microbial replication, but chlorinated water often contains other inorganic components that can damage instrumentation. DI will remove these impurities, but it also removes chlorine, thus allowing microorganisms to reproduce.

Other water treatment processes, such as RO, will remove microorganisms as well as inorganic components, thereby reducing the microbial load in the water. However, the RO treatment system might become contaminated with microorganisms and subsequently develop biofilm on the inner surfaces of the piping, leaving the water with unacceptable microbial levels.

Matching water type to cleaning phase

In the precleaning phase, tap water may be used to remove gross debris immediately after surgery. To prevent coagulation of blood and other proteins, the temperature of the water used for this purpose should not exceed 45°C (113°F).

Tap water may also be used in the cleaning phase, but its physical characteristics must be checked to ensure that the water does not have excessive dissolved minerals or other undesirable characteristics that make it incompatible for use with detergents. The detergent manufacturer can verify this.

Tap water may be used for rinsing and removing soil loosened by the cleaning process and for rinsing and removing detergent residue, but it must meet the requirements for utility water.

Critical water is recommended for instruments that will contact the bloodstream or other sterile areas of the body. The final stage in rinsing must be done with water that does not have excessive levels of organics such as endotoxins or other microbial constituents.

Monitoring water quality

Water used to clean instrumentation should be routinely monitored and tested by facility engineers for pH level, hardness, purity, and temperature. Abnormalities should be communicated to the sterile processing department (SPD).

Likewise, the SPD should alert the engineers if there is a problem with the water. The SPD may also use commercial products to test for pH, alkalinity, and hardness, and some detergent manufacturers will test the water to determine how it interacts with their products.

Tap water that meets the requirements for utility water and that is compatible with detergents may be used for instrument cleaning, but it must be monitored and treated if it contains an excessive amount of dissolved minerals or other undesirable substances.

For additional information, consult the Association for the Advancement of Medical Instrumentation’s (AAMI) 2014 Technical Information Report, which provides comprehensive guidance on water quality (http://www.techstreet.com/products/1884812).
The decision to add a new procedure in an ambulatory surgery center (ASC) is a matter of weighing risks and opportunities. A long list of variables must be analyzed and compared. Is the prospect of higher profit worth the investment that will be required in staff and equipment? Is our patient population appropriate, physically and financially, to undergo procedures usually done in hospitals? What do our surgeons, anesthesiologists, and nurses know about the techniques they would have to master? And so on.

As science and social policy combine in the 21st century to encourage a trend toward outpatient surgery, ASCs are in the forefront of that decision making. What is realistic today, and what will be realistic tomorrow?

The operative word is “acuity,” according to Beverly Kirchner, BSN, RN, CNOR, CASC. At the 2014 OR Manager Conference, Kirchner, CEO of Genesee Associates, Lewisville, Texas, and Shumaker, a perioperative consultant based in Memphis, Tennessee, presented an overview of the issues in moving cases of increasingly higher acuity to ASC settings.

New procedures, sicker patients move to ASCs

“There are a lot of procedures that we never would have dreamed of doing in an ASC years ago that we’re doing now,” Shumaker says.

She and Kirchner outlined a few examples of procedures considered high acuity that are making their way into ASCs.

Spine procedures were among the first to migrate from hospitals to ASCs as technology improved, and the Centers for Medicare & Medicaid Services (CMS) has begun recognizing the change by approving more types of procedures. CMS has agreed to add 10 spine procedure codes to those approved for outpatient surgery for Medicare patients in 2015:

- 22551: Neck spine fuse & remove below c2
- 22554: Neck spine fusion
- 22612: Lumbar spine fusion
- 22614: Spine fusion extra segment
- 63020: Neck spine disk surgery
- 63030: Low back disk surgery
- 63042: Laminotomy single lumbar
- 63045: Removal of spinal laminacervical
- 63047: Removal of spinal laminalumbar
- 63056: Decompress spinal cord.

These procedures can be performed on appropriate patients at ASCs for a lower cost because overhead expenses—such as inpatient facilities—are lower, and surgical site infections are rare.

In the near future, it will be possible to perform neuro-elec-
Electrical stimulation at ASCs to treat Parkinson’s and other tremor diseases. They are already able to insert generators and change batteries used in neuro-electrical stimulation procedures.

In the field of obstetrics and gynecology, the number of inpatient hysterectomies is expected to decline as less-invasive alternatives proliferate. The newest methods of tumor removal can be performed in an ASC.

“These patients are going home within 2 to 3 hours, and they’re not losing their uteruses, and they’re pain free,” Kirchner says.

Outpatient angioplasty is also becoming practical for carefully selected patients. Contraindications include living alone, limited mobility, severe disabilities, and lack of a telephone or other communication system, obesity and pregnancy.

Other specialties increasingly appearing in ASCs include orthopedics and bariatric surgery.

Facilities and staff expand
The trend has not been lost on hospitals. Many are seeking to acquire or build their own free-standing ASCs, such as a Denver health system that has announced plans to develop five new ASCs.

New construction provides an opportunity to factor in the expected increase in high-acuity procedures. In addition to larger spaces and equipment for more complex spine, orthopedic, and cardiology cases, newer ASCs contain 23-hour-observation units.

However, Shumaker notes, older ASCs may have to modify their facilities. “They didn’t invest the money or even think about needing to have a 23-hour observation unit because of the kind of procedures they were doing when they were built,” she says. When deciding whether to invest in a 23-hour observation unit, they should also consider the need to add qualified staff to monitor the patients, she adds.

Before taking on a new specialty, an ASC manager should be sure of the commitment and capabilities of its physicians. If the new specialty will require an anesthesiologist, for example, that provider must be familiar with ambulatory surgery.

As for surgeons, they should be skilled and experienced in the procedure in question, with a history of good outcomes. Studies show the best outcomes are associated with the fastest surgeons; they have the most skill and confidence.

Look at the total patient
The physician should evaluate each patient before referral to the ASC, but the selection process continues through admission to the facility. The more complex the procedure, the more important it is to determine the patient’s health and fitness, yet experience is showing that perfect health is not necessary to benefit from outpatient surgery.

The typical review starts with a medical history and the American Society of Anesthesiologists (ASA) classification system. ASA uses six patient classifications: I—A healthy person II—Mild systemic disease III—Severe systemic disease IV—Severe systemic disease that is a constant threat to life V—A moribund person who is not expected to survive without the operation VI—A declared brain-dead person whose organs are being removed for donor purposes.

However, Shumaker notes, the definitions are not really clear. “What’s a normal healthy patient?” she asks. “Would that be a 17-year-old?” Instead, she advises, consider physical conditions such as body mass index (BMI), respiratory or cardiac problems, blood pressure and kidney function.

Kirchner adds, “The preadmission program is the most important part of an ASC when you go to higher acuity cases.”

They recommend a standard assessment program, using software with an algorithm in which a “yes” answer triggers follow-up questions. Use experienced nurses who know what to look and listen for.

Appoint someone such as the medical director to make the final decision whether to accept a particular patient, and be sure the governing board agrees to support that person.
sion team should also include staff members who can express concerns and observations.

Generally patients age 85 and older are not accepted because of the risks of general anesthesia. Neither are patients in ASA class IV (severe systemic disease). Presence of cancer or HIV poses increased risks, as do procedures that take more than 1 hour of operating time. “It’s not one disease; it’s the total disease process that we look at now,” Kirchner says.

Manage expectations
When the surgeon, staff, facility, and medical evaluations have been prepared for the high-acuity procedure, one more step remains: educating the patient. The more complex the outpatient procedure, the greater the patient’s responsibility for healing. Knowing what to expect and what will be expected of them can make all the difference in outcomes and the patients’ experiences.

“You need to know the willingness of your patient to learn and what their support system is,” Shumaker says. “Can they take care of a patient who’s had a higher acuity surgery?”

A patient who lacks a family or other able caregivers, or who lacks a healthy, safe home environment is not a likely candidate for outpatient surgery, especially high-acuity surgery.

The education and compliance process begins before admission. Talk with the patient and family about how to prepare for the procedure, how long it will take, how long the patient will remain at the ASC, and what kind of care is required at home.

A key element is infection prevention. “Ninety percent of postsurgical infections at ASCs are from Eschericia coli because the patients touched their wounds after going to the bathroom and did not wash their hands,” Kirchner says.

From the patients’ perspective, it is important to know they will be going home shortly after waking from the anesthesia and why. Some patients are eager to go home soon after surgery, but others resist leaving the comfort of the facility. Without a clear explanation, many will assume they are to remain overnight. Staff should explain they will be more comfortable at home and that the alternative is a transfer to the hospital, which insurance may not cover.

“If you set those expectations up front, you have fewer complaints at the back end that you rushed them out the door,” Kirchner says.

It all comes down to safety, she says. “Communication is the biggest factor in keeping your patients safe—and then coordination. Patient safety is always your first goal, not money. If you focus on patient safety, your bottom line will be there.”

—Paula DeJohn

Reference
Kirchner B, Shumaker R. Movement of higher acuity cases to ASC settings. OR Manager Conference, 2014.

Beverly Kirchner will be a presenter at the OR Manager Conference, October 7-9, in Nashville. Visit www.ormanagerconference.com.
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Effect of OR distraction on stress, workload, and teamwork
Distractions in the OR can be detrimental, finds a study of 90 general surgery cases.

• Irrelevant conversations were linked to poorer team performance, and those initiated by surgeons were tied to lower teamwork in surgeons and anesthesiologists.
• Acoustic distractions were associated with higher stress in surgeons and higher workload in anesthesiologists.
• Equipment-related distractions correlated with higher stress and lower teamwork in nurses.


Operative time linked to complications
Data from 21 hospitals from the Tennessee Surgical Quality Collaborative found that procedures taking <95th % upper confidence standard time limit had significantly fewer urinary tract infections, organ space surgical site infections, sepsis/septic shock, prolonged intubations, and pneumonia.

Long cases had increased rates of these complications plus deep vein thrombosis, deep incisional infections, and wound disruption. The data supports expeditious surgical technique and can be used to counsel individual surgeons to improve outcomes, the authors say.


Carotid stenting tied to high real-world mortality
Carotid stenting was associated with much higher than expected 2-year mortality in an observational study of more than 22,000 Medicare beneficiaries.

An analysis of the Centers for Medicare & Medicaid Services’ carotid artery stenting database from 2005 to 2009 found mortality rates for the 2-year follow-up period of 37.3% among symptomatic patients and 27.7% among asymptomatic patients. Symptomatic patients at least 80 years old had the highest 2-year postprocedural mortality, at 46%.

Older age, symptomatic carotid stenosis, and nonelective hospital admission were associated with increased adjusted hazards of mortality and stroke or transient ischemic attack during and after the periprocedural period, the researchers said.


Hospitals making progress in preventing HAI
US hospitals have made progress in cutting the rates of hospital-acquired infections such as MRSA and deadly diarrheal infections, according to a report from the Centers for Disease Control and Prevention.

Between 2008 and 2013, central line-associated bloodstream infections fell 46%, and Methicillin-resistant Staphylococcus aureus infections dropped 8%.

The report showed a 19% drop in surgical site infections associated with 10 procedures, including a 14% decrease in abdominal hysterectomies and an 8% decrease in colon procedures.

The report says preventing infections in the first place means that patients will not need antibiotics to treat those infections.

—http://www.cdc.gov/media/releases/2015/p0114-mrsa-hospitals-report.html