Setting up a beta-blocker protocol to prevent cardiac complications

What if there was a way to reduce the risk of cardiac complications of noncardiac surgery by as much as 90% in your OR? What if this risk could be reduced in a cost-effective manner without new equipment or more personnel?

Research evidence shows that a substantial proportion of cardiac events may be prevented with use of beta-blockers given perioperatively—providing a relative reduction in risk between 30% and 90%. Beta-blockers decrease the heart rate, reducing the demands surgery places on the heart.

Cardiac events, such as myocardial infarction (MI), angina, and congestive heart failure, occur in 5% of patients undergoing noncardiac surgery on average and in as many as 30% of patients at highest risk.

A 2002 report from an American College of Cardiology/American Heart Association task force notes that current studies “suggest that appropriately administered beta-blockers reduce perioperative ischemia and may reduce the risk of MI and death in high-risk patients.”

The National Quality Forum (NQF) Safe Practices for Better Healthcare recommend evaluating each patient having elective surgery for risk of an acute ischemic cardiac event during surgery and providing prophylactic treatment with beta-blockers. The Safe Practices were partially derived from 3 safety “leaps” from the Leapfrog Group, a consortium working to improve health care.

The Leapfrog Group recently added perioperative beta-blockade in vascular surgery patients to its list of key indicators, according to Andrew D. Auerbach, MD, MPH, assistant professor of medicine.

Continued on page 8

Human resources

Sharing OR staff can help meet unpredictable staffing demands

What if you no longer had to worry about covering for sick, absent, or vacationing nursing staff? What if you had a supply of replacement staff with just a phone call? What if these nurses were already familiar with your routines? These are benefits OR managers are garnering by sharing staff with sister hospitals.

Continued on page 12
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Payer trends
Hospital tiering. Physician and patient incentives. How could they affect your facility?

Making an “oops” better
Best ideas for making amends for lapses in customer service.

New tissue standards
What you need to know about JCAHO’s new standards, effective in July.

May 2005 Vol 21, No 5
OR Manager is a monthly publication for personnel in decision-making positions in the operating room.

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OR Manager (USPS 743-010), (ISSN 8756-8047) is published monthly by OR Manager, Inc, 1807 Second St, Suite 61, Santa Fe, NM 87501-5305. Periodicals postage paid at Santa Fe, NM and additional post offices.

OR Manager is indexed in the Cumulative Index to Nursing and Allied Health Literature and MEDLINE/PubMed.

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Subscription rates: $86 per year. Super subscriptions (electronic) $129 per year. Canadian, $98. Foreign, $115. Single issues $10. Address subscription requests to PO Box 3503, Santa Fe, NM 87502-5303.

OR Manager is published monthly by OR Manager, Inc., East Holly Ave/Box 56, Pitman, NJ 08071. Telephone: 856/256-2300; Fax: 856/589-7463. John R. Schmus, national advertising manager. E-mail: schmus@aj.com

Editorial

The physical stress of the job is a serious issue.

There’s some good news about nurses nearing retirement age—not all are going to want to retire.

They may be one of your best resources for meeting growing recruitment and retention challenges.

A startling statistic—70% of the 185,000 nurses hired in 2002 and 2003 were over 50. Peter Buerhaus, RN, PhD, FAAN, the leading researcher on the nursing workforce, told The New York Times (March 23). Hospitals have raised pay scales to attract nurses in their 50s.

Increasingly, employers see employees over 55 as a valuable commodity.

The AARP and 13 major companies introduced a new initiative in February to help Americans aged 50 and over stay in the workforce. Among them are Johns Hopkins Health System, Home Depot, Borders bookstores, and MetLife. They’re offering health benefits, training, and flexible schedules.

“After years of encouraging workers to take early retirement as a way to cut jobs, a growing number of companies are hunting for older workers because they have lower turnover rates and, in many cases, better work performance,” The Times reported.

Easing into retirement

Some might want to ease into retirement.

Some won’t have much choice.

Many baby boomers won’t have enough money to retire early, or even at 65. A survey by Oppenheimer Funds finds the vast majority of both current workers and retirees are uncomfortable with how little they’ve saved.

But it isn’t just financial. Remaining socially connected and keeping your brain stimulated can help ward off the effects of aging. Many nurses value the bond they have with colleagues, patients, and families. They know they would miss that if they quit working.

For managers, the challenge is making the workplace friendly to mature staff—while keeping it friendly for other age groups as well.

Helen Dennis, MA, a clinical psychologist and lecturer in gerontology at the University of Southern California, Los Angeles, suggests areas to look at. She will speak on managing the mature workforce at the Managing Today’s OR Suite conference Oct 19 to 21 in San Diego. Her tips:

• Shift flexibility. OR directors already have that one down. They already offer plenty of shift options to meet nurses’ needs and preferences. Some have the staff do their own scheduling through peer committees. (See November 2004 OR Manager.)

• Specialty assignments. Consider physical demands when matching staff with specialties, if possible.

• Consider ergonomics. The physical stress of the job is a serious issue for nurses of all ages. In a session on ergonomics at the Association of periOperative Registered Nurses Congress in April, when the audience was asked how many had had a life-altering back injury, most raised their hands.

“We need to start thinking about this in the same way we think of bloodborne pathogens,” the speaker, Jamie Tessler, MPH, of the University of Massachusetts, Lowell, said of ergonomic hazards.

Balancing the needs of older workers with those of the rest of the staff is a challenge managers will need to face.

The best way, Dennis suggests, is to say, “We are here to accommodate a diverse workforce, and maturity is part of that diversity.” How can we be proactive in creating a workforce that considers workers of all ages?

—Pat Patterson

Have you come up with creative ways to recruit and retain nurses over 55? We’d like to hear from you. E-mail ppatterson@ormanager.com. We may contact you for an interview.

Correction
Bradley Memorial Hospital, featured in the April article on start times, is located in Southington, Conn.
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MEDLINE INDUSTRIES INC.
in the OR Manager print version.
CMS proposes changes in H&P rule

The Centers for Medicare and Medicaid Services (CMS) is proposing 4 revisions it says will make its rules more flexible and in line with current practice. The proposals came in March 25 draft revisions for the Medicare hospital conditions of participation (CoPs). Comments are due by May 24. No date was given for a final rule.

The proposed revisions cover:
- history and physical (H&P) exams
- authentication of verbal orders
- securing of medications
- postanesthesia evaluation.

The revisions are limited to these issues and do not address nursing in the operating room. CMS says more changes are coming to help relieve “unnecessary burdens” in the rules.

History and physical

CMS proposes the following changes in the Medical Staff CoP at 482.22(c)(5):
- The H&P would have to be completed no more than 30 days before or within 24 hours after admission and placed in the patient’s medical record within 24 hours after admission.
- When the H&P is performed within 30 days of admission, there would have to be an update in the record within 24 hours of admission documenting any changes in the patient’s condition. The proposal does not state what would be required if there are no changes in the patient’s condition.
- No change was proposed for the current CMS requirement that the H&P must be done no more than 7 days before admission or within 48 hours after admission, with an update required if the H&P was done 8 to 30 days before admission. In effect, the only proposed changes are to require an update for all H&Ps and to require the H&P to be in the record within 24 hours of admission rather than 48 hours.

An update would be required for all H&Ps.

Authentication of verbal orders

The proposal reinforces the current regulations that say verbal orders should be used infrequently. To make the rule more flexible, CMS proposes allowing an exception for 5 years after the rule is final to the current rule that “all orders, including verbal orders, must be dated, timed, and authenticated promptly by the prescribing practitioner.” The exception would allow “another practitioner who is responsible for the care of the patient” to authenticate orders. The exception would help in situations where a practitioner gives a verbal order, then is off duty for the weekend or an extended time. CMS is allowing 5 years to see if technology develops that would allow practitioners to authenticate orders more efficiently.

If there is no state law specifying a time frame, verbal orders would need to be authenticated within 48 hours.

Medication security

The proposed revisions are meant to help address discussions CMS has had with the American Society of Anesthesiologists (ASA) and JCAHO over locking of anesthesia carts in the OR suite. Anesthesiologists have taken issue with the CMS rule that anesthesia carts with noncontrolled drugs (ie, not Schedule 3 and 4 drugs) have to be locked and under constant observation even though they are in a secure OR suite. Anesthesiologists say it is standard practice to set up anesthesia carts before surgery. That practice is supported by ASA in a 2003 position statement, which was proposed changes are to require an update for all H&Ps and to require the H&P to be in the record within 24 hours of admission rather than 48 hours.

The changes would bring the CMS requirements in line with those of the Joint Commission on Accreditation of Healthcare Organizations.
- CMS would also allow other practitioners to do the H&P The proposal says the H&P could be completed by a physician or “other qualified individual who has been granted these privileges by the medical staff in accordance with state law.”

Under current rules, the H&P must be done by a doctor of medicine or osteopathy, or an oromaxillofacial surgeon for oromaxillofacial surgery. The MD or DO may delegate the H&P but must sign it and assume responsibility for it.

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Please see the ad for
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Ortho implant companies get subpoenas

Several large orthopedic implant manufacturers acknowledged in late March they had received subpoenas from the US Department of Justice. The subpoenas were seeking information about the industry's relationships with surgeons.

In a news release, Stryker said the subpoena requested consulting contracts, professional service agreements, or "remunerative agreements" between the company and orthopedic surgeons. Four other companies—Johnson & Johnson’s DePuy Orthopaedics, Biomet, Smith & Nephew, and Zimmer Holdings—said they received similar subpoenas.

The investigation is being led by the US attorney’s office in Newark, which would not comment. All of the companies said they would cooperate with the investigation.

“This probe has been going on behind the scenes for some time,” Peter Young, a consultant with HealthCare Strategic Directions, Fort Myers, Fla, told OR Manager. He expects it to broaden.

“Most hospitals have been what I’ll call ‘victims’ of pricing schemes where they have seen pricing of orthopedic implants increase dramatically over the past 5 or so years.”

Implant vendors cultivate relationships with surgeons, and many surgeons develop loyalties to one brand. Hospitals say that makes it difficult to get surgeons to standardize to one or two vendors, which would enable them to negotiate better prices.

From 2003 to 2004, for example, implant prices rose by 9% while Medicare reimbursement was up by only 2.4%.

Gainsharing got another boost in early March. The Medicare Payment Advisory Commission (MedPAC) recommended to Congress authorizing arrangements that would allow physicians and hospitals to share savings from cost management projects. For example, a hospital and a physician group might agree on a plan to save money by standardizing on orthopedic implants and supplies. They would then split the savings.

MedPAC’s recommendation came in a report on specialty hospitals ordered by Congress (www.medpac.gov). It closely followed the government's favorable rulings in February on 6 gainsharing plans developed by Goodroe Healthcare Consulting of Atlanta (www.goodroe.com) (April OR Manager). Those plans were carefully crafted to avoid abuse.

Capturing incentives

MedPAC suggested gainsharing could help general hospitals capture some of the incentives that drive physicians to invest in specialty hospitals. Among reasons physicians set up their own hospitals are to gain more control over how the hospital is run and to improve their work life and patient satisfaction. Physicians may also be motivated by financial rewards from investing in a hospital, which help them make up for cuts in reimbursement.

General hospitals are blocked from giving physicians financial incentives by Medicare fraud and abuse laws. Federal law bars hospitals from giving physicians incentives because the government fears they might cause doctors to limit care to Medicare patients. For example, doctors might cut corners on technology or shift more costly patients to other hospitals.

MedPAC said it believes gainsharing could improve patient care and reduce costs if there are safeguards to prevent care from being jeopardized.

Watch for Salary/Career survey

The annual OR Manager Salary/Career survey is being mailed this month to a sample of OR Manager subscribers. If you receive one, please take a few minutes to fill it out. The information is very helpful to your colleagues. Results will be in the September and October issues.
Patient safety

Continued from page 1

cine at the University of California, San Francisco.

‘Hard stuff’

Though evidence of the efficacy of perioperative beta-blockade has been reasonably strong for almost 8 years, it has not been widely incorporated into practice, says Dr Auerbach, who has been the lead author in many publications on perioperative beta-blocker use.

“This is hard stuff—more complicated than antibiotics for surgical site infection] prevention in terms of clinical complexity,” Dr Auerbach told OR Manager. Also, prophylactic perioperative beta-blockade is a relatively new concept. Not many physicians know much about it yet, and they don’t have anyone to learn from. Some are concerned that the evidence base is not sufficient to make a strong commitment to a beta-blocker protocol at this time, he said.

Nevertheless, more OR managers are being asked by physicians to develop a protocol for perioperative beta-blockers.

Dr Auerbach suggests that questions to address when setting up a protocol include:

- Which patients should be targeted?
- Who identifies the patients?
- Who orders the agent?
- Who determines which agent to use?
- When should the agent be started, and when should it be stopped?

‘Start it up’

Key to starting a perioperative beta-blocker protocol is a physician champion who believes in the benefits of beta-blockade, says Patricia Conte, RN, BSN, CNOR. Conte, who is director of surgical services at OSF St Joseph Medical Center, Bloomington, Ill, began setting up a perioperative beta-blocker protocol about 3 years ago for the 5-room inpatient OR.

The anesthesiologists were the most interested and involved in getting the protocol started and implemented, though the other physicians were supportive, notes Conte.

“Our chief of anesthesia was passionate that this could save lives, and the anesthesiologists really wanted to get the ball rolling on a protocol,” she says.

Anesthesia section committee members drafted a plan for a protocol and sent it to the departments of medicine, surgery, cardiology, and the medical executives to get input and buy-in from other physicians.

The cardiologists were especially positive about the plan, but they didn’t want to administer the protocol because they are not involved with patients coming in for noncardiac surgery, says Conte.

A protocol and algorithm were drafted by nurses and anesthesiologists to be administered by nursing and anesthesiologists, with the preadmission testing (PAT) nurse identifying patients to receive beta-blockers up front. (See flow sheet, p 9.)

Identifying patients

St Joseph has a PAT department where the majority of patients are assessed before surgery. Patients who are unable to come to the PAT are interviewed by telephone.

Either way, the PAT nurse identifies patients as candidates for perioperative beta-blockade, using inclusion/exclusion criteria (sidebar), and then notifies the anesthesia providers. An anesthesiologist interviews the patient, makes the final decision for the protocol, and writes an order to proceed.

St Joseph is in the process of revising its criteria and weighting each criterion with points to determine more specifically who would benefit from beta-blockade.

Dr Auerbach recommends dividing criteria into minor and major clinical risk factors:
- Patients with no major criteria and 1 or less minor criterion would proceed to the OR with no beta-blockers.
- Patients with 1 or 2 major criteria or 2 minor criteria should be assessed for their functional status level before proceeding to the OR with beta-blockade.
- Patients with 3 or more major criteria should undergo additional risk stratification with noninvasive stress testing before proceeding to surgery with beta-blockade.

Implementing a protocol

Hospitals take differing approaches to implementing a beta-blockade protocol and making sure it is carried out. The greatest challenge is how to implement guidelines that ensure all patients are treated appropriately, says Dr Auerbach.

These are his recommendations for implementing a protocol:

- Know your system: Understand how patients get from home to surgeon, to anesthesiologist, to hospital, and back home.
- Know your personnel: Identify interested and motivated personnel from each health care group—physicians, nurses, pharmacists, and nurse practitioners.
- Find a common pathway for all patients to take to get to the OR: If the hospital has a single preoperative clinic, the strongest effort to begin the protocol should be made there.
- Maintain continuity of beta-blockade in the hospital: Have a single order set for all patients that is not altered and that follows the patients across the phases of care.
- Maintain continuity of beta-blockade after discharge: Develop a system that effectively treats patients short term or for a lifetime.
- Have a protocol for dose titration: Have a preprinted algorithm for dose titration.

Kathleen Powell, RN, a PAT nurse, says the hospital has instituted fail-safe measures to ensure a patient’s beta-blocker protocol is implemented correctly. When she identifies a patient, she notifies the scheduling staff of the protocol so they can place a special beta-blocker protocol sticker on their patient information. She also writes a note on a surgical brief form used by the OR nurses. This form, which follows the patient from the surgeon’s office into the operat-

Continued on page 10
**Perioperative beta-blocker protocol**

**Medical center staff flow**

1. **Preadmission testing (PAT) identifies patient as candidate through use of inclusion/exclusion criteria.**
2. **PAT nurse notifies anesthesia and OR scheduling, and a sticker is attached to the patient information.**
3. **OR scheduling will make a notation on the OR schedule to alert staff as to use of the protocol.**
4. **Nurse admitting the patient places orders and sticker on the chart.**
5. **OR staff will transport patient to preop holding, allowing enough time to place patient on monitor and establish baseline.**
6. **Preop holding staff double-checks that orders and sticker are on chart.**
7. **Anesthesia provider manages beta-blockade intraop and in the PACU.**
8. **Surgical nurse monitors vital signs and administers beta-blocker per protocol.**
9. **Postoperatively, surgical nurse notifies the primary care physician and/or surgeon that patient is to receive beta-blockers and documents that notation.**
10. **Surgical nurses calls primary care physician and/or surgeon if problem or if beta-blocker is held per protocol.**

*Source: OSF St Joseph Medical Center, Bloomington, Ill.*
Criteria for beta-blockade

Indications for use of beta-blockers (identified by the preadmission testing nurse through a phone interview)

Major indicators
- The protocol applies if either is identified:
  - History of coronary artery disease (previous myocardial infarction, angina, previous positive stress test)
  - Previous vascular surgery

Minor indicators
- The protocol applies if 3 or more are identified:
  - Age 65 or greater
  - Hypertension
  - Current smoker
  - High cholesterol
  - Diabetes

Contraindications for beta-blockers (assessed by anesthesia)
- Asthma
- Heart failure
- Heart rate < 55; 3rd-degree heart block
- History of bronchospasm
- Renal failure
- Heart failure
- Raynaud’s phenomenon
- Hypoglycemia

Source: OSF St Joseph Medical Center.

Standing orders
St Joseph’s preoperative standing order begins with placing candidates for beta-blockade on a cardiac monitor in the preoperative holding area to establish a baseline reading.

If the anesthesiologist who will be administering the anesthesia believes a patient’s heart rate or blood pressure is too low, he or she can cancel the use of beta-blockers. Otherwise, the patient is given atenolol 5 mg slow IV push over 5 minutes. The dosages were determined by the anesthesiology section committee.

Postoperatively, patients take atenolol 50 mg by mouth daily for 7 days, unless the heart rate, blood pressure, or mean arterial pressure are too low, or if the patient is short of breath or wheezing or in second- or third-degree heart block. The beta-blocker also is not given if the patient is NPO or if a nasogastric tube is in place. In this case, 5 mg of atenolol can be administered by IV push, but the patient must be on continuous telemetry monitoring to receive IV atenolol.

If the atenolol is not given after surgery, the postoperative care unit nurse notifies the patient’s primary care physician.

In the beginning, the protocol specified that patients were to take their beta-blocker by mouth before coming to the hospital, says Jan Weaver, RN, CNOR, operating room clinical manager. But this required the primary care physician to order the medication and tell the patient to take it. “The coordination of this was not happening,” notes Weaver.

That is why the decision was made to administer the beta-blocker by IV push in the preoperative holding area. In addition, the anesthesiologist has another chance to check the patient and decide before surgery whether the drug should be given.

“One of the important things the preoperative holding nurses must remember is to remind the anesthesiologists to document when they withhold the beta-blocker,” says Weaver. This information is important not only for the patient’s other caregivers but also for data gathering. “When we gather the statistics, it shows the drug was withheld appropriately and not that the patient just didn’t get it,” Weaver says.

Presently, about 5 or 6 patients a month are placed on the beta-blocker protocol. Many patients already take beta-blockers and are not placed on the protocol.

—Judith M. Mathias, RN, MA


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Auerbach A D, Goldman L. B-blockers and reduction of cardiac events in noncardiac surgery: Clinical applications. JAMA. March 20, 2002;287:1445-1447.
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says Lyn Ames, RN, MS, CNOR, CNAA, director of perioperative services for the Southcoast Hospitals Group, New Bedford, Mass. Southcoast, with 3 hospitals and a freestanding ambulatory surgery center, has a total of 40 operating rooms and performs some 40,000 procedures a year in southeastern Massachusetts.

Staff sharing began when a power failure forced the surgery center to shut down. All of the cases and staff were moved to the main campus until the power could be restored. Then a few months later, the main campus was overwhelmed with cases, and staff from the surgery center volunteered to help.

Since then, all 4 sites have shared staff when there is a dramatic increase in cases or a staff shortage. Ames admits that long-term employees who are comfortable in their environment tend not to want to rotate, but many nurses enjoy the opportunity.

Charge nurses at the 4 sites talk with each other about staffing needs, then ask for volunteers to go to the site that needs help.

Flexibility is a key. Some nurses offer to work 2 or 4 hours or take call at another campus, and some volunteer for per diem assignments. For example, a couple of nurses who work part time at one of the larger hospitals volunteer for per diem work at the smallest facility. Each site has a list of people willing to float.

Getting standardized

Southcoast’s perioperative information system is standardized, so nurses who float need to learn only one system. All sites also have the same documentation and charting system, policies and procedures, instrument setups, and similar OR layouts.

In addition, says Ames, “We go through the same evaluations and have the same job descriptions, competency process and documents, and expectations at all of the sites.” The directors at all of the sites meet and make determinations about competency goals for the year.

Orienting across a system

Southcoast has one perioperative educator who travels among facilities and a standard orientation package for the system. There is also a perioperative nurse training program based at the main campus. The educator makes orientation assignments for all sites.

She also works with the preceptors as new nurses rotate from place to place and through the services.

“It may appear to be an awesome process, but once you have staff sharing established, it truly is a wonderful thing for a system the size of ours,” says Ames.

Another plus, she says, is that staff can learn specialties not offered at their home facility. If ambulatory surgery nurses want to learn neurosurgery or cardiac surgery, they can go to a sister hospital. Similarly, hospital-based nurses can go to the surgery center to learn about eye surgery.

Southcoast does not pay financial incentives to nurses who float, but there are incentives for those who work extra shifts, says Ames.

Evening out work hours

Sharing benefits the staff because it helps to even out the ups and downs of low census or too much overtime, says Terry Elquist, RN, BSN, CASC, administrator of the Rocky Mountain Surgery Center of Pocatello, Idaho.

The surgery center has been sharing staff with the county hospital since shortly after the center opened 8 years ago. The hospital owns 15% of the surgery center, and both facilities have the same medical director.

When the surgery center opened, several hospital staff members went there to work. But the surgery center required them to continue taking call at the hospital for a year so the hospital wouldn’t be short on call staff. Now it is voluntary for staff to travel to both places and take call. Most do so because it is an additional source of income.

Staff sometimes float for an entire day and sometimes for a couple of hours or lunch relief. It has helped build camaraderie among the staffs, who now take float trips together and have Christmas parties.

Generally, staff sharing is determined on a daily basis but is scheduled in advance for staff asking for time off. The hospital and surgery center compare staffing calendars to see where openings need to be filled. Both facilities have block time, with busy and slow days. Mondays are not busy at the surgery center but are busy at the hospital, and Fridays are the opposite, so the ORs plan a week ahead for those days.

Because the 2 facilities have common medical and anesthesia staff, the nursing staff occasionally accompanies physicians to another facility. For example, the orthopedic surgeons now perform almost all of their shoulder procedures at the surgery center, so occasionally when they do a procedure at the hospital, the surgery center sends its staff to the hospital to assist.

Managing orientation

All surgery center staff begin their orientation at the hospital, where they work for 2 weeks. New staff are assigned a proctor who goes with them from the hospital to the surgery center.

The surgery center also shares student nurses with the hospital through a student nurse apprentice program (SNAP) from the Idaho State University School of Nursing in Pocatello. Students are hired in their senior year to assist and shadow the RNs, and they float between the 2 facilities. At least 3 nurses are hired from this program each year.

The 2 facilities are working to make their competency process and checklists more similar. “We want our process to be more compliant with what the hospital does,” says Elquist.

Surgery center staff who float benefit from an annual bonus incentive, which is determined by the number of hours an employee works and the surgery center’s bottom line. The hours spent on call at the hospital count toward the bonus. The hospital does not provide an incentive except for overtime pay nurses receive when working at the surgery center and the fact that they don’t have to take time off when the hospital has a low census but can work at the surgery center instead.

Sharing cardiac staff

Three Phoenix, Ariz-area hospitals affiliated with the Abrazo Health System share cardiac surgery staff. Though not structured, the program has made a big difference, says Tressa Myers, RN, charge nurse at Phoenix Baptist Hospital. Together, the hospitals have 27 ORs, 5 of which are cardiac rooms.

The hospitals began sharing cardiac staff when one facility closed its heart center but are busy at the hospital, and Fridays are the opposite, so the ORs plan a week ahead for those days.

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Culture of collaboration

For staff sharing to be effective, managers at all of the facilities have to work closely together, says Marilyn Harris, RN, MSN, CNOR, director of surgical services for Hanford Community Medical Center and Central Valley General Hospital and an ambulatory surgery center in Hanford, Calif.

“It takes constant awareness, nurturing, and treating with respect,” she says. The sites, 1/2 miles apart, have 9 ORs, 1 c-section room, and a staff of about 20.

The organization chart is fairly flat with Harris serving as director for all 3 facilities and nurses who serve as “board runners” at each facility. They view the OR schedule as a whole for the system, and the scheduling software covers all 3 facilities.

“It has taken some time and change in managers to get ones who can look at this at a high level,” says Harris. The managers use an Excel spreadsheet to track available staffing. If someone wants time off, the managers can quickly see if others have asked to be off at the same time.

When new staff are hired, they are told they will be expected to float to all sites. Each staff member has a home base. The facilities have the same medical staff, anesthesiologists, and surgeons as well as uniform policies, procedures, and documentation forms.

The staff receives clinical ladder points for floating between the facilities, which Harris says has helped motivation. (For more on clinical ladders, see September 2004 OR Manager, p 1.)

—Judith M. Mathias, RN, MA

Opportunities to improve

There’s another way to see these hassles—as opportunities to learn and improve, says Amy Edmondson, PhD, who conducted the study with colleague Anita Tucker, DBA, now at the Wharton School.

Edmondson will talk about her research and lessons for managers at the Managing Today’s OR Suite conference Oct 19 to 21 in San Diego. Her talk at the Friday morning general session is sponsored by the J2 Group. Edmondson focuses on studying cross-functional teams in health care and other industries. Her research also emphasizes the role of psychological safety in enabling learning, change, and innovation.

“A lot of little things go wrong that health care professionals feel they are either too busy to fix or that don’t seem important enough to stop and say, ‘What could we do differently?’” she says.

She’ll suggest strategies managers can use to encourage their staff to capture these small failures and bring them forward to help improve the overall climate of active learning.

Team learning in cardiac surgery

Edmondson will also discuss research she and her colleagues have conducted to learn how cardiac surgery teams adapt to innovations, in particular, minimally invasive cardiac surgery. Minimally invasive surgery has a steep learning curve and disrupts established routines. The study analyzed data from 16 OR teams.

Though people assume the surgeon’s individual skill is the most important
determiner of a good outcome, Edmondson and her colleagues discovered that how the whole team managed the learning process made a big difference.

Some key factors that made teams successful:

• The surgeon’s leadership style was critical. “The more the surgeon framed himself as the leader of a team and the more he was explicit in saying, ‘I can’t do this alone,’ the more people felt engaged and excited about the learning,” she says.

• The more the staff felt comfortable speaking up about their observations and concerns, the more successful the team was.

• Teams that set aside time to gather and preview all aspects of the procedure were more likely to be successful. At one of the successful hospitals, an OR nurse reported that the instruments were ready and wrote up protocol sheets for every group.

• Boundary spanning—coordinating with other affected departments such as cardiology and the ICUs—made a difference in successful implementation of the technology.

Edmondson will talk about how OR leaders can foster the type of climate that furthers safety and successful integration of new technology.

The conference brochure was included in the April issue. You can download the brochure and register online at www.ormanager.com.
Please see the ad for GETINGE/CASTLE INC. in the OR Manager print version.
Robot: Useful tool or costly coat rack?

Use of robots for minimally invasive surgery is expected to grow over the next 5 years as surgeons and patients become more comfortable with this technology.

But without proper planning, utilization of these $1 million devices can be lower than expected, says Joyce Berger, RN, MPH, senior advisor with the Health Technology Center (Health-Tech), a nonprofit health care technology forecasting organization based in San Francisco.

Hospitals purchasing the cutting-edge technology face the danger of falling into the “coat-rack phenomenon,” Berger says. This occurs when an enterprise unwise buys the hospital to purchase a robot, then it’s set aside because the surgeon and staff did not realize how much time it would take to learn to use it.

“It takes a real push by both the OR management team and the surgeons to really utilize it effectively,” says Berger. “There’s a high learning curve—initially, it takes a long time to set up and break down, and procedures are slower. But with practice and real focus on its use, that turns around.” (See related article.)

Results promising

There are few randomized studies, but early results with surgical robots have been promising. Robots have been used most effectively for prostatectomy, heart valve replacement, and tubal reanastomosis in gynecology as well as esophagectomy, antireflux, and bariatric procedures, according to the Feb 16 JAMA.

Use has grown from just 1,500 to 2,000 procedures in 2000 to an estimated 20,000 last year, the March 14 Business Week reports.

Because of greater surgical precision, patients having robot-assisted surgery have had shorter hospital stays; less pain; and decreased risks of infection, blood loss, and scarring, experts say. Depending on the procedure, patients can return to normal activity in a shorter time than with conventional surgery. At City of Hope in Duarte, Calif, which has one of the highest volumes of robotic radical prostatectomies, patients having robotic surgery are achieving complete bladder control within 1 month, compared to 3 months with laparoscopic surgery and 5 months with open procedures. Surgeons there say potency rates are “significantly improved” with robotics.

The Food and Drug Administration (FDA) approved one robotically assisted surgical device, the da Vinci Robotic Surgical System, about 4 years ago. The device is marketed by Intuitive Surgical Inc, Sunnyvale, Calif (www.intuitivesurgical.com). In all, 286 units have been sold globally, including 201 in the US.

By 2009, 10% of minimally invasive surgeries, including 15% of all radical prostatectomies, are expected to be performed robotically, according to a HealthTech report.

So far, approximately 50% of the surgical robots’ procedures have been urologic, with cardiothoracic and general abdominal surgeries each accounting for 25%, says Anil Rao, research project manager with HealthTech.

Robotics is beginning to move into community hospitals. “It’s not just something geared toward the academic centers now,” he says, noting that 70% of recent sales have been to nonteaching hospitals.

Expensive decision

Embarking on robotics is a costly decision.

Hospitals can’t expect additional reimbursement, and the return on investment has been soft. Hospitals that have adopted the technology have done so primarily to enhance their image for high technology with the hope of attracting more business.

HealthTech projects that as there are more positive outcomes studies, professional societies will advocate for premium reimbursement covering the increased costs of using robotics, and surgeons will drive utilization higher.

Patient demand could drive some of the change.

“There are indications that patients prefer robotic surgery over conventional methods,” Rao says. That could eventually lead to increased market share. One

Evaluating purchase of a surgical robot

• Determine which laparoscopic procedures can successfully be converted to robotic procedures using existing physician resources.

Urological, cardiothoracic, and general abdominal surgeries drive the primary usage of current surgical robots.

• Assess the impact of acquiring a surgical robot on market share and surgical volume.

• Consider the time and financial investment into initial, vendor-based, and hospital-based training. Vendor-based training is typically $6,000 per physician for a 2-day, hands-on session.

• Consider space requirements in the OR to accommodate the robotic equipment.

• Consider the business case for investment in a robot, including marketing, operational, and financial issues.

• Operational and financial return on investment (ROI) is likely to be low in the early years. Measure the marketing ROI in terms of market share, total admissions, and dollars in philanthropy.

• Determine whether your information technology infrastructure has the ability to store digital preoperative planning images and intraoperative videos for outcomes analyses.

Source: Health Technology Center, San Francisco.

Continued on page 18
**Robot coming? How you can prepare**

If robots are coming to your OR suite, you’ll want to get involved early. You’ll need to be prepared for staff training, new instrumentation, a bigger budget, and longer procedures and turnover time during the learning curve, say managers who have these high-tech devices.

City of Hope, a cancer research center in Duarte, Calif, a leading site for the most common robotically assisted surgery, radical prostatectomy, has performed more than 675 of the procedures. City of Hope embarked on robotics almost 2 years ago when it purchased a da Vinci Robotic Surgical System. A second da Vinci was added about 6 months ago.

Poudre Valley Hospital in Fort Collins, Colo, purchased a da Vinci system in June 2004 and is using it in 3 specialties so far: cardiac surgery, gynecology, and urology. Surgeons also have been trained for Roux-en-Y procedures in bariatric surgery.

Directors of surgical services from these 2 facilities discussed areas to consider in launching a robotic surgery program.

**Surgeon credentialing**

In planning for its robot, Poudre Valley formed a multidisciplinary committee to guide the preparations. The committee developed the physician credentialing requirements, laid out a timeline for robotics training as well as laparoscopic training for surgeons who needed it, and planned a quality review process. During the initial phase, all charts for patients having robotic surgery are flagged for review of surgical and nursing care.

**Staff training**

Nurses and surgical technologists (STs) as well as surgeons need education.

“When the physicians are trained on this technology, it’s essential that the staff have training as well,” says Robin Ramsey, RN, BSN, CNOR, administrative director of surgical services at Poudre Valley. “It is very complex to set this up and coordinate the process.”

Poudre Valley sent 3 staff per specialty with the surgeons for the company-provided 2-day training.

In selecting the staff for the program, Ramsey asked them, “Are you willing to commit to potentially having to work past your normal shift or change your day off until we get enough experience with this?” She says, “People have been very willing to do that.” She noted that there also needs to be a plan to train additional nurses, which most organizations probably will choose to do in-house because of the cost.

“You need to be proactive in planning your staffing to allow for people who will leave for hands-on training,” adds Sally Bixby, RN, MS, CNOR, director of surgical services at City of Hope.

City of Hope initially sent 2 RNs and 2 STs for training. Later, the remaining staff attended a 1-day regional program, notes Pam Kenz, RN, BSN, CNOR, clinical manager of surgical services. With 4 ORs, a small staff, and a high volume of robotic surgery, the hospital needed a cadre of staff who knew the equipment.

Bixby suggests assigning the same team to robotic cases at the beginning so they can gain experience. “We had an RN and a tech who became experts. Then as we brought new people in, they would mentor them,” she says.

**Staffing pattern**

Robotic surgery requires 2 surgeons, one at the da Vinci console to operate the robot and one at the table with the instrumentation.

In addition, City of Hope assigns 1 circulator and 1 scrub person per case.

Poudre Valley started with 2 circulators and 1 scrub person because of the setup. Ramsey says she plans soon to assign 2 staff with a roving nurse to assist as needed with the setup and turnover.

**Instrumentation**

Instrumentation and repairs are ongoing costs. Maintenance costs about $100,000 a year, and limited-use instrument sets are $2,000, according to the Health Technology Center, San Francisco. The da Vinci uses specialized instruments that are attached to the robotic arms.

The instruments are “reposable,” meaning they can be reused for a specific number of times, says Bixby. A chip keeps track of the number of uses. She estimates that the instruments are replaced after 10 uses, except for the Harmonic Scalpel, which is replaced after 20 uses. The cost per case for instrumentation is about $1,900 even with the reposables, she says.

City of Hope has more than 1 set of instruments to expedite turnover time.

Poudre Valley is having its service coordinators work together to standardize robotic instruments as much as possible.

“They not only need to coordinate with their physicians but also to communicate with each other to see how we can implement these procedures with a minimum amount of cost,” Ramsey says.

Both facilities say support from Intuitive Surgical, the company that makes the da Vinci robot, has been good, with company personnel readily available for troubleshooting. Bixby notes that reliability with the devices has improved, though there were some problems initially.

**Room setup and tear-down**

Extra time is needed during early cases to get the room ready and disassemble the equipment afterward. Because the equipment is large, room logistics are important. Time is needed to run diagnostic tests on the robot to make sure it is ready for the surgeon to use.

Initially, City of Hope’s turnover time was 1½ hours. It since has dropped to about 30 minutes. “We think that’s the minimum with all of the setup and positioning,” says Bixby.

In addition, the staff needs to be prepared to convert to a traditional procedure, whether laparoscopic or open, in case the surgeon decides that is necessary.

The robot is primarily used in the **Continued on page 18**
same 2 ORs. City of Hope is building a new surgical suite with larger ORs of 650 sq ft that will better accommodate the equipment.

**Procedure time**
Robotic procedures take more time initially. City of Hope’s first robotically assisted prostatectomies took 8 hours; they now take 2 to 2 1/2 hours. It took about 3 weeks for the procedure time to drop to 4 ½ hours and about 8 months to reduce the time to the current 2 1/2 hours, Bixby says.

**Reimbursement**
Hospitals can’t expect additional reimbursement from robotics. "In many ways, this is not a decision for financial gain, but there is a clinical advantage and a marketing advantage to using robotics," says Ramsey.

There are no billing codes specific to robotic surgery. Poudre Valley charges for the instrumentation, and other costs are included in the OR minute rate. During the learning curve, the minute rate was reduced. The rate will be moved back up once physicians determine what their average case time is.

**Strategic benefit**
A robotics program can have a strategic benefit. City of Hope attracts patients from all over the country and even abroad. In early February, it was booked through April for robotically assisted prostatectomies.

Don’t underestimate the planning involved, Ramsey advises. "The process of making the decision, getting the robot here, and getting everyone geared up to use it was more time consuming and challenging than we anticipated," she says. That may have been because multiple specialties were involved.

"It seemed like we had a million-dollar flower pot sitting in our storage area for a while, but now we feel we’re really starting to use it," she says.

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**Costs associated with the da Vinci system**

<table>
<thead>
<tr>
<th>Service</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial cost</td>
<td>&gt;$1 million</td>
</tr>
<tr>
<td>Additional mechanical arm</td>
<td>$200,000</td>
</tr>
<tr>
<td>Ongoing maintenance</td>
<td>$100,000/year</td>
</tr>
<tr>
<td>Fixed-use instrumentation</td>
<td>$2,500/15-20 uses</td>
</tr>
<tr>
<td>One-day system training</td>
<td>$1,500/physician</td>
</tr>
<tr>
<td>Two-day surgical skill animal lab</td>
<td>$6,000/physician</td>
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<tr>
<td>Two-day advanced procedure animal lab</td>
<td>$6,000/physician</td>
</tr>
</tbody>
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Source: Health Technology Center.

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**Education is key**

Education of surgeons and staff and clear procedures for use are keys to avoiding low utilization of the surgical robot, Berger says. “We’ve spoken to a few surgeons who say that the first time they use this, or the first couple of times, the procedure time can double or triple,” Berger says. Once the surgeon becomes proficient, and the nursing staff is accustomed to setting up the equipment, the time drops to about an additional 15 to 20 minutes for the procedure.

Initial training for surgeons is at 3- or 4-day off-site seminars. The manufacturer offers a 2-day introductory course at $6,000 per physician. An advanced procedure lab costs another $6,000 for the 2-day training. The company also offers a course for nurses and ancillary staff.

Once staff and surgeons have been trained and become efficient in use of the device, staffing is the same as for conventional minimally invasive cases, Rao says.

The report also predicts robots will intensify turf battles between surgeons and interventional radiologists. Surgical robots are expected to advance surgery and interventional treatments as they become the next-generation platform for the delivery of biologic agents and directed-energy therapies.

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**Sources**


Eighteenth Annual
Managing Today’s OR Suite
San Diego
Manchester Grand Hyatt
October 19-21, 2005
If you’re planning new operating rooms to be built in the next few years, what should you consider?

This is advice from Joyce Berger, RN, MPH, senior advisor with the Health Technology Center, San Francisco, who specializes in planning for health care environments. The center, known as HealthTech, is a nonprofit organization that focuses on technology forecasting and decision making (www.healthtechcenter.org).

Make the ORs large enough

Regarding the size for new operating rooms, “we would recommend a minimum of 600 sq ft,” Berger says. “This is for general surgery and the majority of cases.” The reason for large rooms, she says, is to be able to do any case in any room and not have to wait for a specialty room.

The exception is cardiac and neurosurgery rooms, which she recommends be larger, around 750 sq ft, due to space needed for the cardiopulmonary bypass equipment or neurological imaging equipment.

That is larger than the current recommendation in the Guidelines for Design and Construction of Hospital and Health Care Facilities from the American Institute of Architects and Facility Guidelines Institute, published in 2001. The guidelines recommend that new ORs have a minimum clear area of 400 sq ft for general ORs and a minimum clear area of 600 sq ft for cardiovascular, orthopedic, neurosurgical, and other ORs requiring additional personnel and equipment. No change is proposed in a draft of revised guidelines scheduled for publication in 2006.

Have the ORs be identical

Berger suggests designing ORs to be identical, not mirror images.

“This is necessary for safety reasons so that any staff member entering any room knows where everything is located,” she says.
dedicated ambulatory surgery center because most outpatient cases are elective, fairly short, and can be done most efficiently in a dedicated area. Others say surgeons prefer to do all of their cases, both inpatient and outpatient, in one OR. “If you have the luxury of being able to have a separate ambulatory department close to your main OR, that’s probably the best situation,” Berger says.

Plan for enough storage space

With space-consuming equipment being used in surgery, storage needs to be planned to keep the hallways clear. Says Berger, “What we’re seeing is people building about 200 sq ft of equipment storage per OR.” Storage space is “absolutely critical” though it is often the first thing planners want to take away, she says.

Consider materials flow

Plan to have separate flows for clean and contaminated supplies and equipment.

“If you can have the central sterile reprocessing area directly under the operating rooms, that is ideal,” Berger says. “Plan for dedicated elevators for clean and dirty supplies—not dumb waiters.” With elevators, the staff doesn’t have to wait for someone on another floor to load the dumb waiter; they can go and get the materials themselves if necessary.

Also, consider how you will dispose of waste, both solid and liquid, to comply with regulations and minimize contact by personnel.

Recommendations for materials flow are in the Guidelines for Design and Construction of Hospital and Health Care Facilities.

Plan for patient- and family-friendly preoperative and postoperative areas

“The trend is for preop and postop spaces to be large and more private than in the past,” says Berger. “In the preop area, there is a big trend toward 3-sided rooms with a glass door on the front—no more big areas with curtains between the beds.”

Joyce Berger will present a breakout session on trends in OR design at the Managing Today’s OR Suite conference Oct 19 to 21 in San Diego. The conference brochure is at www.ormanager.com.

Resources

Managing people

When coaching and counseling fail

If you have a problem employee, you’ll want to take extra steps to help the person improve performance. That may make more economic sense than terminating the person and training a replacement. There are times, though, when you may face an employee whose problems are unmanageable, and stronger action is needed.

Discipline, though inevitable, is one of a manager’s most difficult and stressful responsibilities. In Out of Crisis, quality management guru W. Edwards Deming wrote, “People can face almost any problem except the problems of people. Faced with problems with people, management will go into a state of paralysis.”

When coaching and counseling fail, no matter how difficult, the manager must initiate disciplinary action.

No surprises

A pink slip for poor performance should never come out of the blue. That’s why most organizations use progressive degrees of discipline. This gives the employee the opportunity to correct his or her performance. Progressive corrective actions, or warning steps, serve 3 purposes:

• positive reinforcement—the manager and staff member engage in joint problem solving to gain early correction of employee misconduct
• documentation to show “just cause” in case the employee must be terminated
• a warning to the employee of further repercussions if undesirable behaviors or actions continue.

There is no set standard for how many oral warnings must be given prior to a written warning or how many written warnings must precede termination. Factors to consider are:

• how many different offenses are involved
• the seriousness of the offense
• the time interval and employee response to prior disciplinary action
• the employees’ previous work history.

In general, the steps consist of several oral warnings, followed at the next infraction by a written warning, followed at the next infraction by termination. This is especially true in cases where the time between offenses is short, and the employee demonstrates a lack of desire to improve performance.

Most health care organizations have defined disciplinary procedures to protect employees’ rights from arbitrary dismissal and lack of feedback. Consult your organization’s disciplinary process before initiating action.

Using positive discipline

A model known as “positive discipline” emphasizes giving staff reminders rather than reprimands or warnings. Positive discipline uses a 3-step process.

Step 1

The manager and employee meet to discuss a solution to the employee’s performance problem. The outcome is the employee’s oral agreement to improve performance. At this first meeting, refrain from reprimanding the employee or threatening further disciplinary action. After the meeting, use your notes to write a memo or other documentation that summarizes the conversation. A written record of this first conference may not be placed in the employee’s personnel file, but keep the notes in your own files. Here’s an example of verbal reminder documentation:

“I talked to [employee] today about her attendance record and gave her a verbal reminder. Since July 1, [employee] has been absent from work on 12 occasions for a total of 17 days. [The employee] response was, ‘You can’t make people work when they are sick,’ and she argued about the verbal reminder. I told her that she could request a medical leave of absence if she needed it, but that I expected her to be here every day unless a doctor says otherwise.”

[Signature]
[Date]

Step 2

If the performance problems continue, schedule another meeting with the
Steps in positive discipline

Step 1
- Give the employee a verbal explanation of the errant behavior.
- Reiterate your department’s performance standards regarding that behavior.
- Advise the employee of the consequences of further infractions of the standards in question.
- If no further problems occur with the issue raised at the verbal reminder stage, no further disciplinary action needs to be taken.

Step 2
If the problem persists:
- Give the employee a written explanation of the errant behavior.
- Reiterate your department’s performance standards regarding that behavior.
- Advise the employee that if the problem continues, the employee will be suspended or terminated.
- As before, give the employee an opportunity to change the unwanted behavior. If the behavior does not recur, no further disciplinary action is taken.

Step 3
If verbal and written reminders fail to bring about a change in the undesired conduct, the employee is suspended or immediately terminated without additional reminders.

Documentation is important for supporting your decision.

This step occurs if the second manager-employee conference fails to produce the desired result. At this point, some organizations give the employee a paid 1-day decision-making leave, during which the employee is asked to decide whether he or she wants to continue working for the facility. Employees are instructed to return the following day with a decision—either commit to improving their performance or resign. If no commitment is made, then the employee is terminated. Another option is suspension with pay for a stated period, depending on the policies of your organization.

At this point, it is not uncommon for an employee to resign just as you are ready to discharge the person. This is not just a way for the employee to save face, but also a way to avoid a nasty confrontation and an employment record that includes a termination. If the staff member does not resign, and you’ve established that verbal and written reminders haven’t brought about a change in conduct, the employee should be terminated without additional reminders. In most organizations, when an employee is discharged as the final step after warning notices have been given for an accumulation of infractions, the employee is terminated for cause instead of being given the option to resign, be laid off, or retire. The steps of positive discipline are summarized in the sidebar.

Contending with nonperformers

It is often easier to deal with employee behavior problems than performance problems. Staff members who are disruptive, break key rules or standards, or hide their mistakes, often make a manager so angry that disciplinary action becomes easier. Still, it is best to start with discussions and attempts to resolve the matter before pulling the plug entirely. I’ve had to fire employees in my career as a manager, and I’ve always found the behavior problems easier to deal with. Firing someone for poor performance, even after counseling, reviews, and warnings, is never easy. But if you cannot bring yourself to terminate somebody who can’t or won’t perform up to expectations, then management is not for you because it goes with the territory.

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Call for abstracts for poster display at conference

The Managing Today’s OR Suite Conference to be held Oct 19 to 21 in San Diego will include a poster display of research studies, process improvement projects, and clinical innovations.

If you would like your poster to be considered, please submit an abstract by July 15.

More information, including an abstract submission form, is available at www.ormanager.com or by calling 800/442-9918.
How do you figure out how much of a delay to schedule when 2 surgeons are operating in the same OR on the same day? If you are using a seat-of-the-pants estimate, there is a better way using data you probably already have on hand.

Consider the following scenario:

- An outpatient surgery center has full-time hourly employees who work at least 8 hours each work day Monday through Friday. Scheduled hours are 7 am to 3 pm. There are virtually no cases added on the day of surgery.
- OR 4 is allocated on Fridays as first-come first-served, open, unblocked OR time for use by surgeons who do not schedule enough cases on Fridays to fill an entire OR.
- On Thursday at 12 noon, OR 4 has 4 cases scheduled for Friday. From 7 am to 11:30 am, Surgeon D has 3 cases. Then, from 11:45 am to 1:45 pm, Surgeon E has one case.
- No case can likely be moved from OR 1, OR 2, or OR 3 into OR 4.
- Surgeon D has probably underestimated the durations of his 3 cases. In this scenario, there is no disadvantage to scheduling Surgeon E’s case to start somewhere later (eg, 12:15 pm). Doing so would reduce the average expected time the patient would have to wait after arrival on the day of surgery. Doing so also would reduce the average time Surgeon E would be delayed upon arrival. And doing so likely would improve Surgeon E’s professional satisfaction.

The scheduler can call Surgeon E’s office and figure out if he or she would like to start a bit later. If so, a small delay is scheduled between Surgeon D and Surgeon E. Nice and simple.

Some OR managers will say: “This scenario doesn’t apply to my situation at all.” If so, skip this article.

If it does apply to you, the big question is how to make sure that if a delay is scheduled, Surgeon E does not take so long that the case ends after 3 pm, the end of the scheduled work day. That is where the science can help.

How do you keep cases from extending past 3 pm?

Maximum duration of scheduled delay

Suppose we could say: “There is a 90% chance that Surgeon E’s case will take no more than 2.5 hours.” Then Surgeon E’s case should be scheduled to start no later than 12:30 pm. (12:30 pm - 3:00 pm = 2.5 hours).

The scheduled delay would then be the difference between 12:30 pm and the time Surgeon D’s cases are scheduled to end, at 11:30 AM. This maximum scheduled delay of 1 hour does not necessarily mean there would be a 1-hour gap between the end of Surgeon D’s cases and Surgeon E’s case. If on the day of surgery, Surgeon D finishes his last case later than scheduled, the actual delay between the 2 surgeons’ cases would be shorter than the scheduled delay. Unless Surgeon D finishes his cases after 12:30 pm, Surgeon E’s case would start at 12:30 pm.

Calculating the maximum scheduled delay

The trick is to figure out the longest time Surgeon E’s case will likely take. This can be done using historical case duration data, which is stored in most OR information systems, anesthesia information management systems, or anesthesia billing systems.

What is necessary is to use:

- the mean duration of cases of the same scheduled procedure, anesthetic, and surgeon
- the standard deviation of those cases and
- the number of such cases.

The mean, standard deviation, and N are used in the calculations. The standard deviation and N are used so the uncertainty in the estimated duration is included in the calculation. The final value is rounded to the nearest 15 minutes, so that the start time is some useful value like 12:30 pm instead of 12:32 pm. The equations are given in the paper by Dexter et al, 2004. This works at getting the right answer using just historical case duration data. For single cases, the calculated 90% upper prediction bounds are at least as long as their actual duration for 90% ± 0.2% of cases (mean ± standard error). For pairs of cases, the 90% upper prediction bounds are at least as long as the actual duration for 91% ± 0.6%.

Just as the mathematics works so well in this situation, ad hoc efforts to estimate the answer work very poorly. Is it sufficient to use an average case duration and add a fudge factor to it (eg, 0.5 hr longer)? No, because the standard deviation varies among scheduled procedures, as does the number of historical cases (N). Dexter and Traub (2000) give some examples of how poorly this type of estimate performs.

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Franklin Dexter, MD, PhD, has published more than 100 articles on the science of OR management and related issues. Visit www.franklindexter.net

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Dexter F, Traub R D, Lebowitz P. Scheduling a delay between different surgeons’ cases in the same operating room on the same day using upper prediction bounds for case durations. Anesthesia & Analgesia. 2001;92:943-946.
When our ambulatory surgery center (ASC) identified some situations where supply charges were not being captured, it was apparent there were opportunities to streamline the process. We developed a quality improvement (QI) process that helped us improve our supply charge capture per surgical patient by 150% in 8 months.

Outpatient Surgical Services (OSS) is a freestanding multi-specialty ambulatory surgery center (ASC) in Plantation, Fla, owned by HCA and specializing in gastrointestinal, orthopedic, ophthalmologic, urologic, podiatric, gynecologic, plastic, and general surgery and averaging over 1,200 procedures each month.

The OSS business office had identified a few cases where some high-dollar supply charges had not been documented by the OR, coded by medical records, or billed by the business office. There were also delays in billing of up to a month for some supplies.

A closer look
We decided to take a closer look at how this process could be improved. We developed a QI team in September 2004 with key individuals, including the OR manager, medical records coder, biller, purchasing supervisor, business office manager, QI coordinator, and the administrator. We agreed that this issue had high priority and that the team should meet weekly to expedite problem resolution.

To understand the interdisciplinary process of capturing charges, we flowcharted the process (see chart p 26). We started with anticipating supplies needed at the time of scheduling and added each step until we ended with the billing of applicable supply fees. The flowchart was revised many times as we learned more about each department’s role.

A charge record—in neon orange
One of the first quick fixes was to ensure that each OR chart pack had a charge record in it. In looking at the process, we realized that the documentation of supplies used in the OR was inconsistent. The main reason was that the charge records were kept in a separate file and were not always available. Putting the charge record in each patient’s chart pack made it easier for the staff to comply with recording the supplies used. We also made the charge record neon orange so no one could miss it!

Which supplies are billable?
The next step was identification of billable supplies. We reviewed company contracts, HCPCS guidelines, and insurance policies to determine which supplies could be billed. This was an exercise we all learned from. For example, we found that Medicare and Medicaid do not reimburse at the same rate for some supplies as other insurers.

We realized early that there were many past cases with supplies that were not billed. Because billing those cases retroactively would be difficult at best, we decided initially to look at the high-dollar cases for the past year and bill them based on regulations for filing claims. In addition, we agreed that the OR manager will forward the implant log to the biller monthly to ensure all implants are billed.

We bill for implants according to billing guidelines if they are over $75. All of our managed care payers except 2 pay at 55% of charges; the remaining 2 pay at cost plus 10%. Other commercial payers pay according to their coverage, usually 50% to 70% of charges. Medicare and Medicaid have specific guidelines for implants, which are provided by our corporate office.

Coder is key
The coder was another key person in this process. Unless the coder was given correct supply use information, the codes could not be entered into the system. The new charge record was the vehicle for this critical information. The charge record was updated by the OR manager and purchasing supervisor to make sure all supplies were identified so the billing office could review them and determine if they were billable based on regulations. As the coder...
Flowchart of charge capture process

Patient scheduled for procedure with supplies.

Scheduling prints booking sheet and delivers to OR director.

OR director initials and dates booking sheet and delivers to Purchasing.

Is supply in stock?

No

Purchasing orders supply, creates PO, notifies OR director of order.

Purchasing writes PO # on booking sheet with date of delivery, sends original to accounts payable (AP) clerk.

AP clerk ensures name, date of service, and physician’s name is on PO, then files with invoice attached.

Biller files PO by date of service and references to determine charges.

Supply used in OR.

Yes

Supply charge sheet placed in medical record.

OR nurse places supply sticker and/or writes supplies used on supply charge sheet.

Medical record received and assembled in Health Information Management. Supply charge sheet placed in front of chart.

Coder reviews chart and supply charge sheet and enters supply code as appropriate.

Coder sends supply charge sheet and face sheet to Business Office biller.

Biller applies applicable supply fees to bill.

Source: Outpatient Surgical Services, Plantation, Fla.
reviews each chart, she makes sure each case has a charge record listing supplies used, and the supplies used match the procedure performed. Any discrepancies are brought to the OR manager’s attention. After the chart is coded, the coder removes the charge record and sends it to the biller.

Once the biller receives information about which claims are coded and can be billed, she again reviews the OR supply log and ensures that all supplies have been captured and coded. She also reviews the corporate billing regulations and determines if items meet the billing criteria. On a daily basis, the biller meets with the purchasing supervisor to verify the cost of supplies. Once correct prices are obtained, the biller proceeds with billing the procedures and supplies.

The purchasing supervisor is responsible for having supplies available for upcoming surgical procedures. She communicates with the OR manager about pending procedures and places orders accordingly.

In the event of special orders for patients, the purchasing supervisor forwards a copy of the order to the biller. The biller keeps these copies in a file to submit to payers that require this information.

**Efforts pay off**
The measure of success for our team was the increase in gross revenue from supplies. In the months prior to developing the QI team, OSS was capturing an average of $40 per surgical patient from supplies. Charge capture began to steadily increase after our QI project began. In January, average supply charges per patient were over $100. Clearly, our efforts were paying off! Needless to say, supply revenues fluctuate with patient volumes, case types, and surgical complexity. However, with our new controlled processes, we can be assured that whatever the case mix, we will be billing appropriately for all supplies.

Gathering an interdepartmental team for this QI initiative was essential to understanding the variables in the process and providing the necessary input to solve the problems identified. Getting constructive and creative ideas from the team members made this project successful and rewarding.

Continuous communication between the involved staff and departments will be essential to the ongoing success of our team. The team will meet quarterly to check the progress of the supply revenue capture and review how the new processes are working.

To celebrate our success, we presented a summary of the team’s progress to the general staff meeting. Kudos were given to all the members.

—Monica Hamilton, RN, BSN, MIHA, CPHQ, LHRM
Quality Improvement & Risk Manager
Outpatient Surgery Services
Plantation, Fla

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**Nominate OR Manager of Year**

Each year at the Managing Today’s OR Suite conference, a manager or director is named OR Manager of the Year.

This year’s conference will be Oct 19 to 21 in San Diego.

The OR Manager of the Year will receive an expense-paid trip to the meeting, including air fare, hotel, meals, and registration.

In recognizing an individual manager, the award honors all OR managers for their important roles.

To nominate a manager, write a letter of about 300 words describing what makes the manager deserving of the award.

Send the letter to OR Manager, Inc, OR Manager of the Year Award, PO Box 5303, Santa Fe, NM 87502-5303. Deadline is July 1.

Nominations are judged by the OR Manager advisory board.
A preprocedure time of less than 10 minutes for cataract surgery? Discharge in less than 10 minutes? It can be done. But it may take more staff.

Ambulatory surgery centers (ASCs) that had the shortest times for cataract procedures in a new benchmarking study also seemed to assign more personnel.

The 2 facilities with the fastest preprocedure times had “rather heavy staffing compared with the others,” says Naomi Kuznets, PhD, director of the Accreditation Association for Ambulatory Health Care (AAAHHC) Institute for Quality Improvement, which performed the study.

The facility with the shortest time uses 3 RNs and 5 technicians in all phases of the procedure, while the facility in second place uses 3 RNs and 4 technicians.

In all, 71 facilities participated in the 2004 study, including 30 who participated the previous year. Four improved their total patient time in the facility by more than 20 minutes over 2003. Most participants (58%) were single-speciality centers, and the rest were multispeciality facilities. This is the fifth year the study has been conducted.

The shortest preprocedure time—9 minutes—was achieved by Castleman Surgery Center, a 2-OR single-specialty physician-owned facility in Southgate, Mich. Eleven surgeons perform about 2,500 cataract procedures a year.

For discharge, the Eye Surgery Center of Western Ohio in Lima, had the second shortest time. The center has 2 ORs, 4 surgeons who perform cataract procedures, and an annual cataract volume of about 2,400 cases.

Keeping preprocedure time short

Several practices that make a difference in Castleman’s preprocedure time:

- adequate staffing
- customized paperwork for each surgeon
- timely administration of eye drops.

### Cataract surgery benchmarks

<table>
<thead>
<tr>
<th>Procedure times</th>
<th>Median/average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preprocedure time</td>
<td>76 minutes</td>
<td>9 to 141 minutes</td>
</tr>
<tr>
<td>Procedure time</td>
<td>14 minutes</td>
<td>4 to 24 minutes</td>
</tr>
<tr>
<td>Discharge time</td>
<td>21 minutes</td>
<td></td>
</tr>
<tr>
<td>Total facility time</td>
<td>129 minutes</td>
<td></td>
</tr>
</tbody>
</table>

#### Standardization

- More than two-thirds said they had standardized instrumentation for all of their cataract surgeons.
- 30 of 71 had standardized the intraocular lens brand for all surgeons.
- 59 of 71 use multidose eyedrops; 29 mixed the drops themselves.

Source: AAAHC Institute, 2005.

### Staffing for cataracts

Castleman assigns 3 RNs and 5 technicians for cataract surgery; most are cross-trained and work in all 3 phases of the procedure.

“Physically, our preoperative and postoperative areas are very close to each other,” explains Donna Henderson, RN, the director of surgical services. “We have an RN in the preop and postop areas and in the OR. We also have a tech in each area.”

On days when the fastest surgeons operate, an additional tech is assigned to move back and forth between the pre- and postop areas. Henderson serves as 1 of the RNs. Three of the techs are medical assistants; the other 2 are surgical technologists (STs) who scrub for the cases.

To maximize its efficiency, Castleman uses 2 ORs for 1 surgeon. While the surgeon is operating in the first room, an ST and medical assistant are preparing the second room. When the surgeon finishes, he and the RN can go directly to the second room. The first room is then prepared for the next patient. Using 2 ORs, the fastest surgeons can perform 5 cases in an hour. The average is 3.5 to 4 cases an hour. At another top performer, the Eye Surgery Center of Western Ohio, the fastest surgeon can perform 8 cases an hour, with the average for all surgeons at 3.5 to 4 cases an hour.

This arrangement “is more cost-effective than staffing both rooms with an entire staff,” says Linda Phillips, RN, Castleman’s administrator. Most of the staff is contingent, meaning that they go home when surgery is completed.

“Our staff has been with us for years, and we don’t have frequent turnover,” she adds. “They are astute at being efficient without compromising the quality of care.”

### Custom paperwork

Paperwork is customized for each surgeon.

“For every surgeon, we have the preop and postop paperwork—what dilating drops they are using, what postop drops the patient will be on, and the local anesthetic they use,” Phillips says. “Most of our charting is minimized to check boxes and initials, rather than a lot of handwriting. All you have to do when you put in a drop is to put in the time and initial.”

Customized paperwork for 11 surgeons may sound overwhelming but is actually simple, she notes. The paperwork is kept in stacked bins, each labeled with a surgeon’s name. Charts are made up by a surgical coordinator. When a case is scheduled, she takes the surgeon’s paperwork and places it in the chart.

Henderson contacts each surgeon’s office every 6 months to verify that the orders are still current.
2 ORs for 1 surgeon: How well does it work?

A common strategy in cataract surgery is to use 2 ORs for 1 surgeon. As soon as the surgeon finishes in 1 room, he can go directly to the second room, where the next patient is ready. Most participants (47 of 71) in the AAAHC Institute for Quality Improvement study use this approach.

Whether it’s efficient depends on how the procedures are paced. “Some are better at using 2 rooms than others,” says the institute’s director, Naomi Kuznets, PhD. “It depends on how organized your staff is and how ready you are to move back and forth.”

Some facilities can do 6 procedures per hour using 2 rooms, while others can do 5 procedures an hour with 1 room available.

Using 2 rooms per surgeon, there was a wide range in unused time per procedure—0 to 30 minutes—with an average of 9.7 minutes. Considering that turnover time for cataract cases is short anyway, that raises the question of how much efficiency ASCs gain with this arrangement.

There is an extra cost to using 2 rooms per surgeon, the study found. Centers estimated an average additional personnel cost per procedure of $78, ranging widely from zero to $800. For equipment and supplies, the average additional cost per procedure was $314, with a range of zero to $517.

On balance, says Kuznets, it’s hard to tell whether using 2 rooms allows the facility to better meet the needs of more surgeons and reduces the number of hours the center needs to be open.

“If you’re in an area with high facility and staff costs, you really have to make the most of your resources for the additional OR per surgeon to work out,” she says.

Timely administration of eye drops

Preoperative preparation begins as soon as the patient arrives for surgery. Patients typically arrive 30 minutes before they are scheduled to go to the OR. The receptionist greets the patient and pushes a button at the front desk that lights up in the preop area to signal the staff. A staff member immediately goes out to meet the patient and verifies that the surgical consent form has been signed. The staff member takes the patient to the preop area to start the process.

Other efficient practices

Some practices that helped other best performers keep preprocedure time short were:

- adjusting patients’ arrival times for faster and slower surgeons
- performing cataract surgery on dedicated days of the week
- using compound eye drops that achieve pupil dilation in 15 minutes.

When patients arrive seems to influence the time, Kuznets notes. Patients who arrive very early may contribute to a longer average preprocedure time, the 2003 study found. She suggested that organizations compare their average preprocedure time with their instructions for patient arrival to see if the arrival time they are recommending is appropriate.

Timely discharge

Minimal sedation and carefully planned patient instruction help facilities prepare patients for discharge efficiently.

The shortest discharge time was under 10 minutes, and the average was 21 minutes.

At the Eye Center of Western Ohio, which discharges its patients in under 10 minutes, patients receive primarily topical anesthesia and 1 to 2 mg of Versed for sedation.

“When patients come out of the OR, we take 1 set of vital signs,” says the center’s nursing director, Diane Repko, RN. If the vital signs are similar to the baseline on admission, the patient’s IV is discontinued and the patient is prepared for discharge. During this process, discharge instructions are reviewed. Patients have already received instructions on their eye drops preoperatively and are instructed to use their drops for 2 days before surgery to assess their compliance.

As is common, patients leave their street clothes on and are transported on the same stretcher throughout the process.

Minimal sedation is an important factor, Kuznets comments. “We see that repeatedly in the reports we do. The patient’s time in the facility is affected by how much anesthetic is used and how it is stopped to allow more rapid meeting

Continued on page 30

Preventing wrong-eye surgery

All but one of the facilities participating in the AAAHC Institute for Quality Improvement benchmarking study on cataract surgery have a procedure to prevent wrong-site surgery. But surprisingly, only 9 of the 71 surgery centers have a procedure that includes all 3 of these elements:

1. the patient signing or marking the site before surgery
2. the surgeon signing or marking the site before surgery
3. a timeout in the OR to ensure the site has been verified by the appropriate persons.

The others did not describe their policy or used 1 or 2 of the elements.

All but 4 of the participants are accredited by AAAHC, whose standards are not as prescriptive as those of the Joint Commission on Accreditation of Healthcare Organizations.

In its 2005 standards, which went into effect in March, AAAHC calls for a process to identify the procedure and site, involving the patient; have the person performing the procedure mark the site; and verify the information immediately prior to the procedure. The standards say the operating surgeon is personally responsible for ensuring that all aspects of the verification have been completed before the procedure.

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of discharge criteria, at the same time avoiding pain or other issues.”

Castleman’s discharge time also was in the top 10, averaging less than 20 minutes. Patient teaching during the discharge phase is focused, Henderson notes. Much of the teaching is done preoperatively in the physician’s office. Patients also are scheduled to be seen in the physicians’ office the day after surgery. Thus, teaching before discharge is limited to what the patient needs to know until the postop appointment.

“We review the key points patients need to know,” Henderson says. “We try not to overwhelm them with a week or 10 days of postoperative care we know will be reviewed at the postop appointment.”

**Patient outcomes**

Few complications were reported in the study. Approximately 1.2% of cases had complications. That compares with an intraoperative complication rate of 2.7% reported by the American Society of Cataract and Refractive Surgery. The most common complication was a postcapsular tear, reported in 8 of the 1,724 cases in the study.

For more information on the study, contact the AAAHC institute at 847-853-6060. The study can be purchased at www.aaahc.org. In the menu at the top of the page, select AAAHC Institute for Quality Improvement.
Please see the ad for BFW INC. in the OR Manager print version.
Computer keyboards harbor antibiotic-resistant bugs

Vancomycin-resistant Enterococcus faecium (VRE) and methicillin-resistant Staphylococcus aureus survived 24 hours on computer keyboards and keyboard covers in a new study.

Gloved and ungloved hands that touched the keyboards became contaminated, emphasizing the importance of hand hygiene before patient contact. Two quaternary ammonium compounds were tested for disinfection of the keyboards. A compound with a 10-minute dwell time (Virex II 256 by Johnson Wax Professional) was successful in disinfecting keyboards and keyboard covers. A 5-minute compound (Sani-Wipes by PDI) was successful in disinfecting keyboards, but organisms were still present on keyboard covers after 5 min.

A poster display by Clare C. Cameron and colleagues of Northwestern Memorial Hospital, Chicago, was presented at the Society for Healthcare Epidemiology of America meeting in April in Los Angeles.

CDC advises not giving magnesium sulfate solution from PharMEDium

The Centers for Disease Control and Prevention on April 8 advised not administering magnesium sulfate solution from PharMEDium Services. PharMEDium said it is voluntarily recalling all strengths of 50 mL magnesium sulfate admixtures. The advisory was a follow-up to a March 25 notice of Serratia marcescens bacteremia associated with contaminated magnesium sulfate from PharMEDium.

JCAHO approves new tissue standards

New standards on tissue handling from the Joint Commission on Accreditation of Healthcare Organizations are effective July 1. The standards apply to hospitals, critical access hospitals, ambulatory care organizations, and office-based surgery.

The 3 standards (PC.17.10, PC.17.20, and PC.17.30) require organizations to:

- use standardized procedures to acquire, receive, store, and issue tissues
- have recordkeeping that permits tissue to be traced from the donor or source facility to all recipients or other final disposition, including disposal
- define a process to investigate adverse events involving tissue or donor infections.

Alcohol-based surgical preps banned in some jurisdictions

After a recent surgical fire, some jurisdictions are saying alcohol-based surgical preps should not be used if use of electrosurgery or cautery is planned, based on interpretations of NFPA 99, the American Society for Healthcare Engineering (ASHE) reports.

But ASHE says it does not think NFPA 99 prohibits alcohol-based prep solutions. ASHE recommends hospitals and other health care facilities be allowed to continue using alcohol-based surgical prep solutions, provided use is consistent with product labeling and instructions. There also should be protocols and procedures to ensure solutions are thoroughly dry before a source of ignition is used. An ASHE advisory is on the web site of the Association for Professionals in Infection Control and Epidemiology, Inc.

—www.apic.org