Regional anesthesia has strong outcomes for care, efficiencies

Patients who have surgery today are more likely to be awake during their procedures, thanks to regional anesthesia. Rather than being intubated and given inhalational anesthesia, patients have a nerve block that numbs the surgical region plus some sedation.

Among benefits—better pain control with less use of opioids, less nausea and vomiting, shorter recovery stays, and fewer hospital admissions. There could be big economic benefits as well. A cost analysis from one hospital finds that converting its 3,000 annual invasive outpatient orthopedic procedures from general gas anesthesia to nerve blocks could save over $1 million a year.

There are some obstacles—critics say regional anesthesia is time-consuming, not easy to learn, and has its own risks. Reimbursement has lagged, dampening anesthesia providers’ enthusiasm. But advocates say many of the shortcomings can be overcome with planning and education.

OR Manager talked with experts about what is needed to plan and implement a safe, effective program for regional anesthesia.

Blocking the pain

Types of regional anesthesia include:

• epidural and spinal anesthesia (ie,

Continued on page 9

Six Sigma gives leaders tools for improving processes in OR

Six Sigma—no, it’s not a sorority or a secret society. It’s a quality improvement method developed by major companies like GE and Motorola that aims to get as close to “zero defects” as possible.

Some ORs are learning to apply Six Sigma to improve processes such as turnover time and surgical case delays. Six Sigma creates a framework for change. The main idea is that if you can measure how many “defects” are in a process, you can figure out how to eliminate them in a systematic way. A defect can mean you are failing to meet a customer’s needs—such as a surgeon’s needs for less downtime between cases.

A key concept is achieving stable operations—consistent, predictable processes to improve what the customer sees and feels.

Within GE, Six Sigma has become a way of life. “It is now the way we work, in everything we do and in every product we design,” the company says.

Two GE consultants—both RNs and Six Sigma “black belts”—explained how they helped an Ohio hospital with 12 ORs use Six Sigma to improve patient throughput and surgeon satisfaction. A black belt is trained in Six Sigma to work on quality improvement full time. A quick introduction to Six Sigma is in the sidebar.

“At the beginning of the project, some in the OR thought the surgeons

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**Upcoming**

**Costs for gastric bypass**
Eight facilities compare their costs for laparoscopic gastric bypass in a new benchmarking study.

**Improving the CS department**
Leaders share their strategies for improving this critical department.

**Nation’s “safest hospital”**
How the University of Michigan aims to reach this lofty goal.

**Editorial**

Vickie Broerman, RN, is resting comfortably after her foot and ankle reconstruction. She’s not in pain even though she’s not taking narcotics. She’s getting ready to go home.

The day before, the pain had been “horrific,” she says. Relief came in the form of a thin catheter threaded into a nerve in her thigh. Attached to the catheter is a pain pump that delivers a local anesthetic. She will take the pain pump home with her.

“I’m very grateful for it,” says Broerman, a confessed Type A who says she doesn’t like the out-of-control feeling patients typically get with narcotics.

At Surgery Center Premier in Colorado Springs, Colo, where she had her surgery, many of the orthopedic surgery patients have regional anesthesia. The center can keep patients overnight under state regulations.

Dr Steven Clendenden, who administered the block, says it’s common to send patients home with good pain relief a day or two after major foot and ankle procedures, shoulder surgery, and other orthopedic procedures.

“We may do 10 procedures a day using blocks,” he says. We watched him skillfully perform a block on a young woman who was getting ready for a rotator cuff repair. He expected her to be start waking up in the OR and to be alert not long after she arrived in the recovery area.

**A progressive movement**
The center is part of a progressive movement to use more regional techniques. Not only do patients wake up faster and have less pain, but big cost savings could also result.

In this issue, we describe a new report by Brian Williams, MD, of the University of Pittsburgh, who found that more than 80% of patients having anterior cruciate ligament repair with nerve blocks were able to fast track through the recovery room, and fewer needed to be admitted to the hospital. He estimated the hospital could save over $1 million a year if nerve blocks were used for all of its invasive outpatient orthopedic cases.

Those big savings require some big changes.

- Anesthesiologists need training and experience, which more MDs are seeking out. The Surgery Center, which has its own training lab, is talking to the University of Colorado about teaching regional techniques to some of its residents.
- With the right setup, regional anesthesia doesn’t take more time in the OR, and may actually take less, studies have shown.
- For savings to happen, a high volume of orthopedic cases would have to be converted to use of regional techniques—occasional use won’t make a difference.

“It has to be a sustained program for almost all eligible cases. That way, Phase I PACU staffing can be adjusted,” comments Frank Dexter, MD, PhD, a researcher at the University of Iowa.

He says he was impressed when he visited the University of Pittsburgh, where PACU nurses told him they could see a difference in how well orthopedic patients did after having nerve blocks, with a lack of nausea, vomiting, and pain.

Organizations can face barriers in trying to shift more procedures to regional techniques. A consistent focus on patient outcomes is a key to help break through these obstacles. ✤

—Pat Patterson

**Participate in salary/career survey**

If you received a copy of our annual salary/career survey, please be sure to send it in. The survey was sent to a random sample of OR Manager subscribers in May.

Now in its 14th year, the survey tracks trends in staffing, skill mix, salaries, benefits, and other OR management issues. Results will be published this fall.
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P

reventing surgical fires may join the list of patient safety goals from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) next year.

The Joint Commission field-tested three new potential safety goals for hospitals and ambulatory care organizations for 2005 this spring. The review ended April 30. Final goals will be announced this summer. New potential goals are:

• reconciling medications and treatments across the continuum of care
• reducing the risk of patient harm from falls
• reducing the risks of surgical fires.

Under the potential goal for fires are three possible requirements:

• educating the staff, including “licensed independent practitioners” and anesthetists, on prevention measures
• developing, implementing, and testing procedures for responding to OR fires
• reporting surgical fires to pertinent agencies, such as JCAHO, ECRI, the Food and Drug Administration, and state agencies to raise awareness and improve prevention.

Preventing wrong surgery

For 2005, the requirements for surgical site verification would be covered under the “universal protocol” for preventing wrong surgery instead of under the patient safety goals. The universal protocol takes effect July 1. The protocol, developed in a national consensus process, includes requirements for surgical site marking, a “time out” before the procedure, and other measures.

The potential new goal for reconciling treatments might include requirements such as obtaining a list of the patient’s medications and reconciling those with the drugs given in the hospital. Another requirement might be to identify a provider who is coordinating the patient’s care and making sure the staff knows how to contact that person.

Under the third potential new goal, to reduce injuries from falls, JCAHO tested six possible requirements, such as assessing patients for risk of fall, implementing a fall reduction program, and using bed alarms and low beds for high-risk patients.

Some possible additions for current goals were also field-tested. Under Goal 1, one potential addition would be to require organizations to install bar code technology by 2007 for identifying patients and matching patients to drugs and treatments.

Under medication safety, JCAHO is considering two new requirements: to restrict IV drug preparation to the pharmacy and/or use commercial premixed IV fluids and to identify a list of look-alike/sound-alike drugs and take action to prevent errors involving them.

JCAHO will consider results of the field review in developing the final goals, which will be approved by its board of commissioners.

The potential patient safety goals are at www.jcaho.org

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Expert to discuss surgical fires

An international expert on surgical fires, Mark Bruley of ECRI, will present a session on OR fire risks and how to control them at the Managing Today’s OR Suite conference October 6 to 8 in Chicago.

Bruley, who has investigated OR fires for 25 years, will discuss the causes of surgical fires, ways to prevent them, and how to extinguish them. He will share case examples.

Please see the ad for SKYTRON, INC. in the OR Manager print version.
Nursing unions joined a move to block new federal overtime rules issued by the Department of Labor (DOL) in April.

The DOL called the new rules a “win for workers,” saying 1.3 million more salaried white-collar workers will qualify for overtime than under the current rules.

In general, workers earning $23,660 to $100,000 would be eligible for overtime pay, provided they aren’t considered executive, administrative, or professional employees.

Under the old regulations, only workers earning less than $8,060 annually were guaranteed overtime pay.

But nursing unions say the rules “threaten the right of RNs” to overtime pay. The American Nurses Association (ANA) and 8 unions that represent nurses supported an amendment sponsored by Sen Tom Harkin (D-Iowa) to block the rules. The U.S. Senate passed the amendment May 4 with some Republicans crossing the aisle to vote for it. But the amendment’s fate was still unclear. It is part of a corporate tax bill the Senate had not yet taken up, and the House had not yet taken up the bill the Senate had yet to approve, and still unclear. It is part of a corporate tax bill the Senate had yet to approve, and the House had not yet taken up the amendment. Time was short with lawmakers eager to leave Washington to campaign.

Without legislation, the rules take effect in August.

Where do RNs stand?

For the first time, the rules clearly state that licensed practical nurses (LPNs) are eligible for overtime pay because they are not required to have an advanced academic degree.

But for RNs, the situation is not as clear-cut. The DOL says on its web site, “Registered nurses who are paid on an hourly basis should still receive overtime pay.”

Under the rules, however, RNs meet the test for “learned professionals” who, if salaried and making over $23,660 a year, can be considered exempt from overtime pay. The DOL says this is not a change from the current rule because RNs have been considered exempt since 1971.

To meet the test to be exempt as “learned professionals,” employees must:

• be salaried and make at least $455 a week ($23,660 a year)

• have as their primary duty work that requires “advanced knowledge” in a “field of science or learning” that is “customarily acquired by a prolonged course of specialized intellectual instruction.”

Would hourly RNs still get overtime?

The unions say the rules don’t do enough to protect the vast majority of RNs—75% according to the DOL—who are paid hourly.

In a letter to the Senate May 5, the unions note the new rules change the definition of “salary” by stating an exempt employee’s earnings “may be calculated on an hourly, daily, or shift basis” without the employee losing exempt status. The unions say that wording could be interpreted to mean hourly employees such as RNs could be denied overtime pay.

The unions give an example of how the new definition could affect an RN who earns $25 an hour and typically works 50 hours a week. Under the current rules, the RN would earn $1,000 for the first 40 hours plus $375 (10 hours at a time-and-a-half rate of $37.50), for a total of $1,375. Under the new rules, the RN would be paid $1,000 for the first 40 hours but might be paid straight time for the additional 10 hours ($250) for a total of $1,250. This is $125 less a week or $6,500 over 52 weeks.

“This rule will cut the pay of registered nurses who already are forced to work mandatory overtime,” the unions wrote.

They charge that hospitals use mandatory overtime to help make up for inadequate staffing, leading to nurse burnout, and that the new rules will make it easier to do so.

“Denying these employees overtime pay will worsen the situation and cause more registered nurses to leave the field,” said the letter signed by ANA, the Service Employees International Union, and the American Federation of Teachers, among others.

Competing for RNs

But the DOL notes in the rule’s preamble that market forces have a bearing on how RNs are paid. In a time of nursing shortage, employers have to compete for RNs, just as they do for other highly skilled workers. Thus, employers are unlikely to rock the boat by forcing RNs to work overtime without premium pay. Doing that could cause nurses to leave and go elsewhere to work.

What seems likely is that the new rules will end up in litigation, which is what DOL says it was trying to avoid with the new rules. The rules are final and will be effective August 23 unless blocked by legislation. They are in the April 23 Federal Register at www.gpoaccess.gov/fr/index.html and are posted at www.dol.gov.

Highlights of rule

• Under the 50-year-old rules, only workers earning less than $8,060 a year were guaranteed overtime.

• Under the new rules:
  —Workers earning less than $23,660 a year are guaranteed overtime—meaning 1.3 million salaried white-collar workers will be eligible who weren’t eligible under the old rules.
  —Licensed practical nurses and similar employees are eligible for overtime.
  —Employees are exempt from overtime if they meet certain tests for their job duties and are paid a salary of $455 a week or more.

Check our web site for the latest news, meeting announcements, and other practical help. www.ormanager.com
Simple skills for keeping managers sane

Amanda Gore reduces men and women to tears—not from sadness but laughter.

Gore teaches leaders and managers how to unwind, de-stress, and find fun in demanding times. “I provide simple skills to keep managers well and sane, until the psychiatrist comes,” Gore says, laughing. “I offer a light-hearted approach to serious messages.”

Gore will be a featured speaker at the Managing Today’s OR Suite conference October 6 to 8 in Chicago in a talk sponsored by Cardinal Health, Medical Products and Services.

She refers to a December 2001 study in the Harvard Business Review that demonstrated the influence a leader’s mood has on the mood of the group. First, breathe. Connect with your body and your heart and breathe properly to prevent conveying aggression or anger to your staff. “It’s simple, but very powerful,” Gore says. “When we are stressed, the first thing we do is shallow breathing.”

Second, don’t take yourself too seriously. “One of the best things you can do when you’re stressed is maintain a sense of humor,” Gore says.

Third, detach from work, such as unwinding in the car on the way home. “Don’t listen to the news or country and western music—unless you really love country and western music. Listen to beautiful music, or better still a comedy tape.”

“Today women are having just as many heart attacks as men,” Gore says. “We need to connect our heads and our hearts, and connect to other people’s hearts, and stop severing ourselves at the neck.”

More information about Amanda Gore is at visit www.amandagore.com

A conference brochure is at www.ormanager.com or phone 800/442-9918.

Where will leaders come from?

What is your organization doing to encourage nurses to go into management?

Do you have a mentoring program? Incentives for leadership roles? Leadership development courses? Skills development for first-line supervisors? Support systems for new managers?

Share your successes with OR Manager. Contact Pat Patterson, Editor, for a possible interview. Results will be published this fall.

E-mail ppatterson@ormanager.com

Nominate OR Manager of Year

As surgical services leaders juggle departments, cope with staffing, and strive to keep quality high, they deserve to be recognized.

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 October 6 to 8 in Chicago.

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

Readers of OR Manager are invited to nominate a manager for the award. Simply write a letter of about 300 words describing why the manager is deserving of the award.

Address specific accomplishments such as leading the staff, inspiring others, improving recruitment and retention, and encouraging collaboration. The letter may be accompanied by letters from colleagues, including physicians, administrators, staff, and other managers.

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

Nominations are judged by members of the OR Manager advisory board. The winner will be notified in August.
neuraxial anesthesia or central blockade) • peripheral nerve blocks (such as axillary, interscalene, and femoral blocks).

Peripheral nerve block is the best option, if possible, according to a study by Klein and Buckenmaier. A single-injection block lasts about 12 to 18 hours, whereas a continuous block can provide postoperative pain relief for 2 to 3 days. Outpatients can use patient-controlled regional anesthesia (PCRA) pumps to deliver local anesthetic. When the pump reservoir is empty, the patient removes the catheter and begins taking oral analgesics.

An old technique returns

Women have been receiving epidurals for childbirth since the 1970s, but regional anesthesia is much older than that. A century ago, all operations were done under peripheral nerve block because it was the safest option, says Terese Horlocker, MD, professor of anesthesiology at the Mayo Clinic in Rochester, Minn, and president of the American Society of Regional Anesthesia & Pain Medicine (ASRA, www.asra.com).

As general and spinal anesthesia became safer, they replaced peripheral blocks, which require more injections, local anesthetic, and technical skill. “Now we’ve kind of come back to the old techniques again,” she tells OR Manager.

Currently, regional anesthesia is used predominantly in orthopedics to numb only the extremity in question. According to ASRA, about 30% of patients request regional anesthesia for their orthopedic procedures. Regional anesthesia is also used:
• in plastic surgery, particularly for breast operations such as mastectomy
• in obstetrics and gynecology
• in cardiac procedures.

Thoracic and abdominal surgery usually include light general anesthesia in combination with regional anesthesia.

Reduced pain and opioid use

Local anesthetics given before surgery can reduce or eliminate the need for opioids and avoid side effects such as nausea and vomiting, respiratory depression, drowsiness, and constipation.

In knee operations, 14% of patients had nausea and vomiting after regional anesthesia versus 36% after general anesthesia, according to a report by Brian Williams, MD, MBA, and his colleagues at the University of Pittsburgh Medical Center.

Horlocker finds nerve blocks “last so long and provide such adequate pain relief, that the only thing patients need in addition to the blocks are oral analgesics—they never need morphine PCA as they would have in the past.”

More efficient process

Not only do nerve blocks mean more comfortable patients—they can also mean a more efficient, cost-effective surgical process.

In a new report, Dr Williams and his team compared 5 types of anesthesia plans for anterior cruciate ligament (ACL) repair. By using peripheral nerve blocks rather than the usual gas anesthesia without a nerve block, they found that:
• 82% of nerve-block patients bypassed the Phase I postanesthesia care unit (PACU)
• unplanned hospital admissions were reduced from 17% to 4% and less.

The nerve-block scenario was associated with cost reductions of:
• 12% from bypassing the PACU ($420 per patient)
• 11% from avoiding hospital admission ($385 per patient).

Patients who stayed in the PACU were more likely to have pain (48% versus 14%) and needed more nursing care for pain and nausea and vomiting.

The observational study of 948 patients was conducted over 4 years. Based on this experience, Dr Williams estimated that converting all of the hospital’s 3,000 annual invasive
A regional anesthesia-friendly process

Advice for change from Brian Williams, MD, of the University of Pittsburgh:

- “Think outside the box.” Physicians and staff need to brainstorm and question existing practices. Every process of perioperative care is subject to change and needs a team-oriented plan.
- Organize a team with an anesthesiologist as the team leader.
- Seek buy-in by all parties involved, with an extensive effort to build consensus, both from the grassroots and senior administration.
- Set a goal, such as converting 50% of outpatient invasive orthopedic procedures within the first year.
- Collect data to compare outcomes for procedures performed with nerve block with gas anesthesia without nerve block.
- Consider indicators such as:
  - “anesthesia-controlled” time in the OR
  - PACU admissions
  - unplanned hospital admissions
  - nursing interventions for nausea and vomiting and pain in the PACU
  - patient satisfaction.

Once physicians begin to see the outcomes from the nerve-block procedures, they may be willing to go a step further and agree on a preferred regional anesthesia technique. Then the team can organize education for physicians and staff and begin developing policies, standard orders, and patient education materials to support the transition.

“It does require a combination of grassroots management and top-down management,” Dr Williams says. “Grassroots tends to work a little better because folks start to see this can work if we give it a reasonable try.”

Regional anesthesia does not increase surgical time.

Continued from page 9

outpatient orthopedic procedures from gas anesthesia with no nerve block to nerve blocks could save the hospital $1.2 million annually.

At a facility that does a high volume of outpatient orthopedic cases and can make a wholesale shift to regional anesthesia, “the cost savings can be tremendous,” he says.

Franklin Dexter, MD, PhD, a researcher on OR efficiency who published an analysis on the subject in 1999, adds, “This increase in the PACU bypass rate is more than enough to result in financially important reductions in perioperative costs.”

But even hospitals with extensive regional anesthesia programs don’t often use PACU bypass, Dr Dexter notes.

“That’s important because intermittent use of Phase I PACU bypass does not reduce costs. It has to be a sustained program used for almost all eligible cases. That way, staffing can be adjusted.”

That requires anesthesia providers skilled in regional and ambulatory anesthesia and policies that can streamline postoperative care.

Impact on OR time

When nerve blocks are performed outside the OR before a case begins, use of regional anesthesia reduces anesthesia-controlled time by an average of 9 minutes compared with general anesthesia, Dr Williams and his group showed in a 2000 process analysis.

Regional anesthesia does not increase surgical time versus general anesthesia when averaged over many different orthopedic procedures, a meta-analysis by Dr Dexter and his colleagues found.

“There definitely is not an increase in OR time with regional anesthesia; rather, it is just the opposite,” notes Dr Dexter, who is at the University of Iowa.

Though reductions in OR time are statistically significant, he adds, they are not likely to be great enough to increase overall OR efficiency in a financially important way in a busy surgical suite, as he demonstrated in 1995 and 2003 studies.

The principal economic benefit is in the improved postoperative recovery.

Special skills needed

Regional anesthesia is labor intensive and requires special skills. The type of block and nerve distribution must be determined correctly. Typically, a nerve stimulator is used to locate the appropriate nerve.

In knee surgery, the anesthesia team and surgeon need to work together to define the intensity of the procedure, nerves to be blocked, and single injection versus continuous infusions and combinations, Dr Williams explains. A single block may take 10 to 15 minutes, while a continuous catheter block could take 20 to 60 minutes.

He cautions against overtreating patients with nerve blocks because every block procedure carries a small but important risk of nerve damage. Estimates of nerve damage range from 2 per 10,000 to 4 per 1,000 patients.

Other considerations include the patient’s age, health status, anesthesia history, previous drug reactions, any history of chronic pain, and type and extent of surgery.

A framework for change

Making the shift from general anesthesia to regional anesthesia is a cultural change that takes a team effort, Dr Williams says.

Over 1 1/2 years, his facility was able to convert ACL patients from 85% gas anesthesia with opioids to 85% regional anesthesia. A framework for change is described in his 2002 article in Best Practice & Research Clinical Anesthesiology, which includes a chart on applying the Plan-Do-Check-Act cycle.

Some obstacles to regional anesthesia include:

- traditional practice patterns of anesthesiologists who may see no incentive to change
- concerns of surgeons about potential nerve-block failures, time to perform
blocks if done in the OR, patients being awake during surgery, and adequate muscle relaxation
• changes in nursing practice, including patient teaching before surgery and PACU bypass.

Changes for nursing
Before an operation, nurses assist with blocks and help position patients. After surgery, they perform neurovascular checks, monitor the limb to prevent pressure sores, help with ambulation, check for catheter leaks and local anesthetic toxicity, and give additional medication if necessary.

Communication between nurses and physicians is key, Horlocker says: “It’s very important that nurses are aware of what the expectations are from the anesthesiologist and the surgeon. If these blocks are done, how long they are going to last, and which parts specifically are supposed to be numb.”
PACU staff need to “learn as much as possible about regional anesthetics, specifically the techniques utilized by the anesthesiologists, medications, and preparation for any side effects,” advises David Miller, RN, unit director of the PACU at Presbyterian University Hospital and Montefiore University Hospital, University of Pittsburgh Medical Center.

The best education, he believes, is through in-services with anesthesiologists.

Horlocker says that at her institution, it only took about 3 or 4 weeks to get up to speed with the protocol and for nurses to become comfortable with regional anesthesia.

“One everybody got on the same page, it was incredible” in benefits to the patient, she says. Because patients have no nausea and ambulate sooner, she believes regional anesthesia “is just perfect from the nursing standpoint—it has decreased the level of intensity of their interventions, and it has really made their life a lot easier.”

Where should blocks be done?
To avoid taking time in the OR, nerve blocks can be performed in an induction room, the holding area, or the PACU.

Dr Williams performs blocks in the PACU in the community hospital where he currently works. Because patients having nerve blocks require less time in the PACU, more of that space is freed up for administering the blocks. But for this arrangement to work, a significant proportion of patients need to be converted to regional anesthesia.

In a large hospital main OR where he previously worked, a sitting room was converted to a nerve-block induction area. The space does not need to be large.

“If you have small portable monitors with oxygen and resuscitation equipment available, you really have what you need,” he says.

Bypassing the Phase I PACU
With regional anesthesia, anesthesiologists generally give “light” general anesthesia, typically with propofol and an anesthetic mask or LMA (laryngeal mask airway), Dr Dexter notes. The propofol is turned off at the start of wound closure. Patients start waking up and undergoing Phase I recovery while still in the OR, which is why they are so often able to bypass the Phase I PACU.

The difference in patients in the PACU is remarkable, Miller says. “They come out in a more awake state. There’s not a question of emergence problems or emergence delirium. You have stable vital signs in those cases, and pain is not an issue as the extremity is generally nice and numb.” The PACU’s interaction with them is about 15 minutes compared with 1 to 2 hours for inhalational general anesthesia.

Dr Williams has established a scoring system for determining which outpatients are eligible for PACU bypass, which is in his 2000 article in Anesthesiology. According to the bypass criteria, patients having a regional anesthetic do not need to be admitted to Phase I recovery if they are awake, their vital signs are stable, they are breathing well, their oxygen saturations are OK, there doesn’t appear to be a surgical complication, and the attending anesthesiologist is in agreement to have them bypass.

Patient teaching

Before discharge
Before a patient who has had regional anesthesia (RA) goes home, the surgeon and nurses should:
• Instruct the patient about RA before surgery and about home care of the blocked limb.
• Warn about the block wearing off and need to begin oral pain medication early.
• Before discharge, check intravascular placement of the peripheral nerve catheter.
• Instruct the patient and caregiver about use of pain pump and care of the catheter.
• Give verbal and written information on signs and symptoms of anesthetic toxicity.
• Give the patient a telephone number to call the physician with problems.
• Call the patient every day to ask about side effects and pain control.

After discharge
After discharge, patients should:
• Avoid weight-bearing on a lower extremity for 24 hours.
• Protect the extremity from heat and cold, monitor its position, and elevate it.
• Start taking oral acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs) (eg, Cox-2 inhibitors) at discharge or at completion of PCA use; take oral opioids for pain.
• Use common sense and reduce activities of daily living.
• Use ice as needed.

Trends in anesthesia

Continued from page 11

block lose their pain reflex for 24 hours or more, raising concerns about falls, trauma, and immobility. Studies have found discharge with a numb limb is safe, however. Klein and Buckenmaier showed the rate of accidental injury or block complication was only 0.2% in more than 2,000 patients having long-acting peripheral nerve block with ropivacaine in the arm or leg.

Patients need careful instruction and discharge planning (sidebar).

The safety of anticoagulation with regional anesthesia has been questioned. Surgical patients often receive anticoagulation therapy to prevent deep vein thrombosis and pulmonary embolism. Epidural anesthesia can be safely given with unfractionated subcutaneous heparin, but low-molecular-weight heparin should be used with caution. Sufficient time must be allowed between the start of the spinal or epidural and the start of anticoagulation, and patients must be monitored closely.

Reimbursement

Unfortunately, reimbursement for anesthesiologists hasn’t kept up with the progress in regional techniques.

New CPT codes for nerve blocks and nerve block catheters were approved in 2003 and were assigned a reasonable number of anesthesia billing units. But negotiated rates and payments from third-party payers are inconsistent, in Dr Williams’s experience.

“Sometimes it feels like roulette—sometimes you get paid nothing, and sometimes you are paid the full value. It is very frustrating,” he says.

Though the government published guidelines for acute pain management in 1992, and the Joint Commission on Accreditation of Healthcare Organizations emphasizes pain relief, physicians say payers still don’t adequately recognize the importance of pain treatments.

Regional anesthesia’s appeal

Most anesthesiologists use regional anesthesia only occasionally, and most residency programs include limited training in peripheral nerve blocks. But use may increase as workshops become more common, such as those held by ASRA and at the Regional Anesthesia Study Center of Iowa.

Dr Williams says it doesn’t take long for a practitioner to see the appeal because of the difference regional techniques make in pain management and in minimizing other symptoms such as nausea, vomiting, and drowsiness.

Once anesthesiologists are converted, they rarely go back to traditional general endotracheal anesthesia because they find their professional satisfaction is enhanced by the quality of care they are delivering and patient satisfaction, he notes.

Horlocker is equally enthusiastic: “It’s a win-win situation—the surgeons love it, the nurses love it, the patients love it, and we anesthesiologists love doing these.”

—Laura J. Ninger, ELS
—Pat Patterson

Laura J. Ninger, ELS, is a freelance medical writer.

OR Manager thanks Franklin Dexter, MD, PhD, of the University of Iowa, for his assistance with this article.

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Have an idea?

Do you have a topic you’d like to see covered in OR Manager? Have you completed a project you think would be of help to others? We’d be glad to consider your suggestions. Please e-mail Editor Pat Patterson at ppatterson@ormanager.com
Quality improvement

An introduction to Six Sigma

What is Six Sigma?
A disciplined, data-driven problem-solving approach that:
• identifies what is most important to the customer
• identifies process defects
• measures those defects versus opportunities
• eliminates those defects
• leads to sustainable change through process redesign.

Six Sigma is another word for standard deviation.
• The higher the sigma number, the fewer the defects. At Six Sigma, the level of defects is 3.4 in 1 million.
• Most companies operate around Three to Four Sigma.
• Moving from Three Sigma to Six Sigma represents a 20,000 times improvement in quality.

Six Sigma performance
99% Good (3.8 Sigma)
• 52 incorrect-site procedures in every 5,000 procedures
• 100,000 wrong drug prescriptions per 1 million filled each year.

99.99966% Good (6 Sigma)
• 1.7 incorrect-site procedures in every 500,000 procedures
• 3.4 wrong drug prescriptions per 1 million filled.

Source: GE Healthcare.

Step 3. Find the critical causes
The team analyzed the data and used exercises and statistical tools to dissect the turnover time process. The aim was to identify the main causes of variation in turnover time—what GE calls the critical Xs. By the end of this step, the team had identified the following critical Xs:
• add-on cases
• anesthesia provider not available
• materials not available
• schedule and room change.

In examining the data, the team learned about the differing perceptions of turnover time. They found surgeons were not aware of all of the activities that needed to occur before the next patient could be brought in.

“Part of the work was getting everyone to talk to each other and understand these activities,” Killam said. “It really helps to show them the data, to segment the data by different services, and to calculate the variation, or the standard deviation, by service and by physician. Physicians tend to respect good data.”

The team learned it was important to understand the variation in turnover times, not just the average. Once the times were graphed, they could see there was a large standard deviation, meaning a broad distribution of turnover times. That broad variation helped to explain why people had different perceptions—they actually were having different experiences.

Some tools the team used in the analysis:
• Process map. A process map, or flow chart, shows the many steps in the turnover process, including where delays can happen.
• Main effects plot. This chart shows the drivers of variation. A main effect is a measurement of the average change in output when a factor is changed from its low level to its high level. For example, improving anesthesia availability could affect the process by 70 minutes.
• Fishbone diagram. This diagram illustrates the factors that contribute to variations in turnover time. After identifying the factors, the team conducted a brainstorming session to identify the ones that were key drivers causing the most variation.

Part of the work is getting everyone to talk to each other.

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were the major factor in turnover time—which turned out not to be the case,” says Rosalie Sager, RN, senior consultant and black belt with GE’s Performance Solutions group. “That belief was driving a wedge between the surgeons and the staff.”

Step 1. Define the problem
The project team began by identifying the outcome it wanted, which GE terms the Y. The Y was “to decrease the cycle time, or turnover time, for procedures.”

The defects identified were:
• turnover time of more than 20 minutes for simple procedures (those of 60 minutes or less)
• turnover time of more than 35 minutes for complex procedures (those of more than 60 minutes).

As often happens in ORs, the team found a lack of consensus on what turnover time meant. “Everyone had a different perception,” notes Eleanor Killam, RN, MBA, a GE senior consultant and black belt.

Nurses considered turnover time to be from when one patient left the OR until the next patient entered. But for surgeons, it was their downtime from when they closed the incision on one case and until they made the incision on the next one.

Step 2. Measure what you care about
Next came the assessment phase—collecting data and getting a high-level view of the process. The team collected a year’s worth of data on the elements of turnover time, such as the scheduled case time, the patient-in-room time, the induction time, and gaps in the schedule.

Some of the data was available from the OR information system, and other data was collected manually and through observation.

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Quality improvement

Current process map of OR turnover time

Work-Out. The Work-Out, a term trademarked by GE, is a rapid, 4- to 8-hour team approach to problem solving that tackles a problem, generates potential solutions, and develops an action plan.

Step 4. Improve the process

After identifying the critical Xs, the team focused on improving them. “This is a very structured approach to making change happen,” says Killam.

The process generates a set of action items, with responsibility, accountability, and target dates for each. Among the solutions identified were:

- Anesthesia providers: The team put in place policies and procedures, called a standard operating procedure, to improve accountability.
- Instrumentation: To improve instrument availability, ownership and accountability for the Central Sterile Department were transferred to Surgical Services.

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Circulating nurse notifies same-day admissions, PACU, family waiting, support staff to have next patient ready 20 min before patient leaves the room.

A

Wait or find someone else to transport patient.

Patient ready?

Anesthesia available?

Surgeon available?

Open supplies/count.

Case cart removed by support tech, scrub RN, and/or OR tech.

Room cleaned.

Circulating RN gets patient from preop area.

Notify core tech/resource RN who notifies CPD.

Wait for case cart/supplies.

End.

No

Yes

No

Yes

No

Yes

B

Patient induced/lines inserted/epidural given, etc.

Patien prepped, draped.

Incision.

Start

Resident available to transport patient.

Yes

Patient transported to PACU.

No

Yes

Case cart and supplies placed into OR.

Next case cart ready?

Yes

No

Additional supplies available?

Yes

No

Pull additional supplies from center core.

A

B


A process map, or flow chart, shows the many steps in the turnover process, including where delays can happen.
Quality improvement

**OR turnover time: Drivers of variation**

Main effects plot:
Data means for previous patient out-next patient in

![Main effects plot diagram](image)


A main effect is a measurement of the average change in output when a factor is changed from its low level to its high level. It is calculated as the average output when a factor is at its high level minus the average output when a factor is at its low level. For example, improving anesthesia availability could affect the process by 70 minutes.

**Sensitivity chart**

Target forecast: Turnover time—complex

![Sensitivity chart](image)

More information on Six Sigma is at www.healthcare.isixsigma.com

**Step 5. Control the process**

At the end of the project, the process owners, such as the OR committee, assume accountability for the process. They are taught tools they can use for ongoing monitoring of the process. They decide what data they want to collect and who will receive regular reports.

“Most facilities today are developing score cards. That’s what we try to do—at least get the big Y on the scorecard, and that scorecard gets passed up to the senior level,” says Donna Seecof, RN, MSN, senior consultant and black belt with GE.

**Outcomes**

The outcomes of the project included:

- a reduction in case delays, including improvements in block scheduling and delays, which increased OR capacity by 6%. If increasing surgical volume to fill this capacity is not feasible, the OR could improve productivity by changing staffing.
- a decrease in average turnover time for complex cases by 60% and for simple cases by 52%.

More information on Six Sigma is at www.healthcare.isixsigma.com

**Six Sigma seminar**

GE “black belts” will lead a seminar, Six Sigma for Process Improvement in the Perioperative Area, at the Managing Today’s OR Suite conference October 6 to 8 in Chicago. A brochure is at www.ormanager.com or call 800/442-9918.
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Please see the ad for LAWSON SOFTWARE in the *OR Manager* print version.
If you could design an OR to make the most of patient throughput, what would it be like?

Massachusetts General Hospital (MGH) in Boston is experimenting with a new model in its OR of the Future.

A patient comes into the OR of the Future already anesthetized and lying on a special OR table-transporter bed that docks to a platform in the floor. Anesthesia has been administered in the adjoining induction room. After surgery, the patient is wheeled on the same table to a small adjoining emerge- nce room for early recovery.

Already, the next patient has been prepared for anesthesia. As soon as the first patient has been handed off to the cross-trained perioperative nurse, the anesthesia provider is free to induce the next patient. While waiting, the sur- geon can go into the attached control room to dictate, prepare for the next case, or make calls while watching the OR through a bank of windows.

Ideally, three patients can be in the space at once—one being prepared for anesthesia, one having surgery, and one emerging from anesthesia.

A project of the Center for Integration of Medicine and New Technology (CIMIT, www.cimit.org) and the US Army’s Telemedicine and Advanced Technology Research Center (TATRC, www.tatrc.org), the OR of the Future is a lab for new staffing models, work- flow, and patient care processes as well as new technology.

More time operating

“One goal is to make sequential processes parallel,” says Marie Egan, RN, MS, project manager for the OR of the Future.

The emergence room serves for early recovery only until the patient can be transported by the perioperative RN.

“That increases efficiency for the anesthesia personnel because they are not required to accompany the patient to the recovery room,” Egan notes.

Having an adjoining room where surgeons can work between cases is an advantage because it “prevents sur- geons from leaving the environment,” notes Keith Isaacson, MD, a surgeon and a leader of the OR of the Future project. “But you have to give them the tools so they can continue working,” such as phones and computers.

Surgeons have told him they like the OR of the Future concept because it enables them to spend more time operating. They also can more easily see their patients before and after surgery. And because they can watch the turnover activities from the control room, they have voiced more appreciation for the work of the OR team, Egan notes.

A lab for new technology

In one example of new technology, personnel and patients wore clip-on radiofrequency ID tags to track their activities. The tags are part of a system developed by MGH and a startup company, Radianse, that allows tracking of people and objects within the coverage area. Using the system, researchers have recorded times activities take place (eg, when the patient entered the room) and intervals between activities (eg, time spent in induction). Then they use the data to analyze the efficiency of processes. The data was validated by human research assistants using handheld devices.

The activity data could be useful in several ways, notes Dawn Tenney, RN, MSN, associate chief nurse for periop- erative services at MGH.

For example, the project team could leave the room to get missing items, where they have to go, and how long it takes to find the items. That might sug- gest ways to improve the supply function.

A human speed limit?

The project is using satisfaction sur- veys and team feedback to learn whether there is a “human speed limit” for the OR staff—a speed beyond which something important is lost. In other words: “Is there a speed over which people feel that events are controlling them?” Tenney says.

OR of the Future project

The project aims to improve patient care and operating room efficiencies. Specific goals are:

- improving patient flow and patient comfort
- reducing turnover time and improving productivity
- enhancing anesthesia efficiency.

The OR of the Future space uses an efficiency model adapted from Europe that includes dedicated induction and recovery spaces adja- cent to the OR.

Source: Center for Integration of Medicine and New Technology (CIMIT). www.cimit.org
For instance, turnover time might be reduced to 10 minutes. But nurse dissatisfaction and staff turnover might rise because nurses would not feel they had enough contact with patients. Or the staff might suffer from “cognitive overload” from trying to absorb information about many patients too quickly.

With the accelerated pace, the circulating nurses have commented that they miss the contact with patients before surgery. There also is a trust issue for RN circulators, who must accept a handoff from the preoperative nurse in the induction room. On the other hand, nurses do handoffs all the time, so this is an issue that might be overcome in time, says Egan.

The OR of the Future requires more nursing staff because the induction and emergence rooms are staffed by a cross-trained RN. But the added labor cost could be offset by the gain from doing an additional case, Egan notes.

At this stage, the data indicates non-operative time has been reduced by 50%, and patient throughput has increased significantly on specific days. “You would need the right case mix for this to work cost-effectively,” Egan notes. She thinks the concept would work best for high-volume cases of 60 to 70 minutes, such as arthroscopy and laparoscopic cholecystectomy or hernia repairs, where enough time might be saved from turnover time to allow additional cases to be done. But she thinks it would not be effective for longer cases because not enough time would be saved during the day to add another long case.

A team from MGH will present a session on the OR of the Future at the Managing Today’s OR Suite meeting October 6 to 8 in Chicago. A brochure is at www.ormanager.com.
U of Maryland’s OR of the Future

The University of Maryland opened its 52,000 sq ft OR of the Future in June 2003. The facility combines advanced video and other communications equipment with information technology.

“While a few other hospitals have installed some of these new technologies, we are unique in that we have tied them all together throughout the new facility,” Stephen C. Schimpff, MD, executive vice president of the University of Maryland Medical Center, said when the facility opened.

Deb Cooksey, RN, BSN, patient care manager for the general OR and minor surgery, says the staff appreciates the flexibility of the new rooms and their ability to be upgraded for new technology.

Some equipment was funded by the U.S. Army’s Telemedicine and Advanced Technology Research Center (TATRC).

OR of the Future facts

- 19 ORs and 2 minor procedure rooms in new building
- Surgical volume: 15,800 a year
- 23-bed surgical prep area
- 28-bed postanesthesia care unit (can house patients for 23-hour recovery)

Operating rooms

- ORs are arranged in three pods.
- All ORs are at least 600 sq ft with 650 sq ft for the most complex cases (liver transplant, cardiothoracic, and minimally invasive general surgery).
- ORs are equipped with high-flow ventilation systems at 25 air exchanges per hour.
- Department has its own pharmacy and laboratory.

Technology

- All ORs have anesthesia and equipment booms with docking stations; some also have perfusion booms.
- Touch screens enable staff to access images and lab results.
- Video images can be directed to flat-panel screens in the rooms;
- 9 rooms have touch panels (router) for advanced video.
- ORs are equipped for radiology imaging using PACS (picture archiving and communication system).
- Wide-view video cameras in each OR beam images to a secure control room. A grant from Verizon will allow video to be downloaded to personal digital assistants (PDAs) so OR and anesthesia coordinators can view and coordinate room activity.
- Four ORs have telemedicine capability with live, two-way audio and video feeds allowing surgeons to train physicians in other locations.
- Some rooms have voice-activated equipment for adjusting lights and other equipment.
- Wireless phones allow staff to communicate directly, though coverage does not extend beyond the OR.
- Digital phones are installed in many locations, including on booms. Phone numbers identify the OR and location: The first two digits designate the phone’s location in a room (eg, 94 is for phones on equipment booms), and the second two digits designate the OR number. Thus, 9426 would call the phone on the boom in OR 26.
- One OR has galvanized steel and copper-lined walls to house an MRI scanner.

Supply management

- Sterile reprocessing department and perioperative distribution center for supplies report to perioperative services.
- Case cart model is used.
- Sterile reprocessing department is in the basement, connected to OR by separate clean and contaminated elevators. ❖
Please see the ad for DUPONT in the *OR Manager* print version.
Glucose control reduces infection risk

Patients’ blood glucose levels can climb under the stress of cardiac surgery, making them more vulnerable to infection and other complications. When one hospital began monitoring blood glucose levels, it found almost all patients having open-heart surgery with cardiopulmonary bypass—90%—had a blood glucose level above 200 mg/dL at some point during the perioperative period.

Another interesting finding—10% of the patients had previously undiagnosed diabetes. “We have identified a lot of diabetics who previously didn’t know they were diabetic,” notes the hospital’s director of cardiac surgical research, Richard Engelman, MD, a retired cardiac surgeon.

A national project

Baystate Medical Center in Springfield, Mass., began a project in 2002 to measure and manage hyperglycemia in its cardiac surgical patients. The 600-bed hospital, which performs about 850 heart operations a year, represented Massachusetts in the national Surgical Infection Prevention (SIP) collaborative sponsored by the Centers for Medicare and Medicaid Services.

In the year-long collaborative, which wrapped up in 2003, some organizations have seen infection rates drop by as much as 70% to 100% for target procedures. The project is now being carried forward by state level Quality Improvement Organizations (QIOs).

Baystate’s cardiac surgery infection rate in the last quarter of 2003 “was the lowest it has ever been,” notes Dr Engelman. He attributes the results at least in part to tighter glucose control and other SIP initiatives, which include improving use of prophylactic antibiotics, warming patients, and eliminating the preoperative shave by using clippers instead.

The Baystate team took on the project because of some compelling evidence. Dr Engelman says, “There is very hard data both from clinical services and research laboratories indicating that having elevated blood sugars has adverse consequences for patients having cardiac surgery.”

There is some debate about whether blood glucose should be maintained below 200 mg/dL, 150 mg/dL, or perhaps even 120 mg/dL. “Clearly, having blood sugars greater than 200 is associated with changes at the cellular level,” Dr Engelman says. Glucose can attach to the cell wall and make the cell membrane more permeable to fluid and bacteria, which are associated with higher rates of infection and other complications.

He referred to a 2001 study in the New England Journal of Medicine of 1,500 patients in the surgical ICU, who were randomly assigned to receive intensive insulin therapy (control of blood sugar levels under 110 mg/dL) or conventional therapy. The intensive therapy reduced mortality from 8% to 4.6% and lowered bloodstream infections, acute renal failure, and other complications.

Closely controlled patients were also less likely to need prolonged mechanical ventilation and intensive care.

“No one had ever shown that before, and it made quite a hit in terms of understanding the ramifications of elevated blood sugar,” Dr Engelman notes.

Not everyone agrees such strict control is necessary, but the study documented the difference such a rigorous effort could make.

The body’s stress response

Blood sugars are elevated during surgery for several reasons, he explains.

First, the body’s stress response leads to release of epinephrine, which in turn induces hyperglycemia. Also, drugs administered during the procedure, including epinephrine, can raise blood sugar levels, and the cardioplegia solution contains glucose, which further contributes to hyperglycemia.

Baystate’s project was guided by a quality improvement team in consultation with the Department of Endocrinology. On the team were Dr Engelman and representatives from the quality division, nursing, OR personnel, anesthesia providers, and the pharmacy.

Baystate’s protocol

In brief, the protocol outlines these steps:

• A fasting blood glucose level is measured in the preoperative holding area for every patient coming to the OR for open-heart surgery.

• For the 30% of patients who have a history of diabetes and a fasting blood glucose of > 75 mg/dL, a protocol is automatically instituted for IV insulin administration during surgery.

• For the remaining 70% of patients, blood glucose is monitored every hour in the OR by the anesthesiologist, using point-of-care testing. An IV insulin drip is initiated if the blood glucose is > 150 mg/dL at the rate of 3 units/h and increasing to as much as 10 to 15 units/h for some patients. Of this group, about 30% will have a prediabetic condition known as fasting-impaired blood glucose (FIBG), with fasting blood glucose levels of 110 mg/dL to 126
Infection control

Studies on glucose control

High blood glucose levels were associated with longer hospital stays and increased charges of about $2,800 and increased costs of about $1,800 in patients having coronary artery bypass graft surgery.


Intensive insulin therapy to maintain blood glucose at or below 110 mg/dL reduces morbidity and mortality among critically ill patients in the surgical ICU.


Postoperative hyperglycemia and previously undiagnosed diabetes were associated with development of surgical site infections in cardiothoracic surgery patients.


Patients with hyperglycemia, particularly mean glucose levels of 200 mg/dL to 230 mg/dL within 36 hours following coronary artery surgery, were more likely to develop infections than patients whose glucose was better controlled.


Continuous IV insulin infusion to control blood glucose levels during cardiac surgery significantly reduced the incidence of deep sternal wound infections.


being developed for a smooth transition from IV insulin to subcutaneous or oral administration. This is challenging because of the number of patients who are resistant to insulin.

Nurses on regular patient units are sometimes reluctant to give patients IV insulin because of the time it takes to monitor patients and concerns about hypoglycemia. But Dr Engelman notes that in Baystate’s experience, patients who receive insulin in a continuous IV infusion are less likely to have large swings in their blood glucose level because they are on a steady dose. They are more likely to become hypoglycemic if they receive bolus injections.

Managing blood glucose in the OR

In the OR, blood glucose control is managed by the anesthesiologists.

“Initially, they were concerned that this was not their responsibility,” Dr Engelman acknowledges.

Once the project team explained the evidence supporting glycemic control, the anesthesiologists were willing to manage the infusion, he says. Gary Kanter, MD, of the cardiac anesthesia staff became the clinical champion for the Department of Anesthesiology.

“This really is not such a difficult thing in organizations doing a lot of cardiac surgery because usually there are anesthesiologists who are interested in improving quality. It is something they will accept once they see the data,” Dr Engelman says.

Glucose control is tracked by Baystate’s Division of Health Care Quality, and the project team meets monthly to review results to see if they are within limits or if the protocol needs to be modified.

Currently, a little over 50% of target patients are being maintained at < 150 mg/dL in the first 48 hours after the procedure, and 75% to 80% are maintained at < 200 mg/dL.

“You have to recognize that if you are recording every blood sugar, a patient may suddenly go out of range for one measurement. Then you get dinged for not meeting the goal, but you still are managing the patient’s blood sugar. So I think we are going to be happier with trend analysis than looking at any one number,” he adds.

Should blood glucose levels be controlled for other surgical procedures as well?

Considering the complications that can ensue with hyperglycemia, “I think there probably is a real risk in the non-cardiac-surgery population,” he comments. In addition, a large number of elderly patients are hyperglycemic.

He cited as at “major league risk” patients who are having procedures such as abdominal aortic aneurysm repair, major vascular surgery, and major cancer resections.

—Pat Patterson

Articles on preventing surgical infection

Previous articles in this series about the national Surgical Infection Project include:

Preoperative hair removal

Use of prophylactic antibiotics
February 2004 OR Manager, p 1, 13-15.

Keeping patients warmed
April 2004 OR Manager, p 1, 12-13, 15

These articles are available to Super Subscribers in the Archive at www.ormanager.com

Position paper on loaners

Two central service societies issued a position paper in May with guidelines for managing loaner instruments and implants. The paper suggests having policies and procedures that cover:

• acquisition of loaners, including designating a person to coordinate this function
• accountability and recordkeeping, including having items delivered in time to allow proper processing
• return of items to the proper place, if applicable.

Managing Today’s OR Suite

Chicago Hyatt Regency
October 6–8, 2004

Sneak preview
General session speakers already on board…
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• Michael Roberto, Harvard Business School, Leadership Lessons Learned from the Everest Disaster
• Mary Murphy, RN, 2002 OR Manager of the Year

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And much, much more…
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What’s the best way to help patients remember information they are given during the informed consent process?

Don’t just talk to them about it—give them written information they can read and discuss.

That’s the advice of plastic surgeon Ara Samuel Makdessian, MD, FRCSC, of the West-Med Facial Cosmetic Surgery Center, Plantation, Fla. He and his colleagues studied patients’ comprehension and recall of preoperative information.

In the prospective, randomized study, they found that patients given a pamphlet in addition to a discussion with the surgeon had better recall 2 weeks later than patients who had a discussion alone.

Dr Makdessian decided to conduct the study because he noticed his patients would come back days after he discussed the risks, benefits, and possible complications of a procedure and wouldn’t remember what he had told them.

In the study, 120 patients undergoing rhinoplasty, rhytidectomy, or laser resurfacing were randomly assigned either to an oral discussion of the risks or oral and written communication (side-bar). Two weeks later, patients were surveyed to see what they recalled.

**The more information, the better**

The findings indicated that written material was key to helping the patients comprehend and recall the risks of their impending surgery.

“Patients remember more, and they can go back and review the risks and complications when they are given a pamphlet to read,” Dr Makdessian told OR Manager.

He has also found the pamphlet helpful if patients have complications.

“They may say they don’t remember the discussion, but when they are shown the information in the pamphlet, their usual answer is, ‘Oh, yes. I remember,’” he says.

Even the slightest complication in cosmetic surgery can upset a patient. But when patients see the complication described in the pamphlet, know it isn’t out of the ordinary, and remember they were forewarned, they appreciate that it was discussed ahead of surgery, notes Dr Makdessian. “Without the pamphlet to remind them, many just would not remember.”

The general rule is that the more information patients are given in as many formats as possible, the better they will remember it.

“It is basic adult learning theory—the more redundant the communication the better,” says Arlen D. Meyers, MD, MBA, of the University of Colorado Health Sciences Center, Denver, who wrote a commentary on the study.

**Informed consent in plastic surgery**

The fundamental concept of informed consent is that patients should receive sufficient information about risks and benefits of a procedure to make an informed decision to accept or refuse treatment. Consent is necessary because surgery is a form of battery that can be excused only when the patient has given consent.

Obtaining consent before surgery is a process, not merely having patients sign a form, Dr Meyers comments. Many people think informed consent includes only risks and benefits of a procedure to make an informed decision to accept or refuse treatment. Consent is necessary because surgery is a form of battery that can be excused only when the patient has given consent.

Obtaining consent before surgery is a process, not merely having patients sign a form, Dr Meyers comments. Many people think informed consent includes only risks and benefits of a procedure, but informed consent also should cover the benefits, disadvantages, alternatives, and limitations.

Elements of informed consent are no different for facial plastic surgery than for any other surgery, Dr Meyers told OR Manager. But because facial plastic surgery is elective and involves patients’ perceptions of themselves, surgeons need to do a good job of communicating about the expectations.
Pamphlet lists rhinoplasty risks

Risks outlined in a pamphlet by plastic surgeon Ara Samuel Makdessian, MD, FRCSC:

1. Nose bleeding (epistaxis)
   There is a very low chance that you might bleed from the nose. It usually occurs 2 weeks after surgery. Avoiding heavy exercise, heavy lifting, and trauma to the nose can reduce this risk. This bleeding may require treatment.

2. Numbness of nasal tip
   You should expect numbness of the tip of the nose after the surgery. This may persist for up to 8 months. It usually resolves on its own.

3. Asymmetry of the tip and supratip
   There may be unevenness of the tip of the nose as well as the area above it. This is dependent on how you heal. If this occurs, steroid (Kenalog) injections may be required to correct it.

4. Nose not being perfectly straight
   Straightening a crooked nose is the most difficult aspect of rhinoplasty. We would do our best to straighten the nose, but we cannot guarantee a perfectly straight nose. However, the nose will be straighter.

5. Bruising and swelling
   Bruising and swelling are expected. The amount of bruising varies from patient to patient. It usually occurs around the eyes. Swelling is expected as well. Most of the swelling and bruising disappear, and you will look “socially acceptable” by the end of 2 weeks. Some swelling may last up to a year.

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“We are not just operating on the physical part of the body, we are really affecting a person’s self-esteem and psyche, and that is difficult to get a handle on,” he says.

Defining a patient’s expectations may be more demanding in facial plastic surgery than in orthopedics, Dr Meyers says. “You fix a knee, and you want it to work; you don’t want it to hurt. But in facial plastic surgery, there are issues about a patient’s expectations for the face lift, nose job, or blepharoplasty.”

What should patients be told?

What should patients be told about the risks and complications?

Dr Meyers suggests that surgeons consider the “reasonable patient rule” or “reasonable physician rule.” In other words, what should a reasonable person know about a complication? And what would a reasonably prudent physician disclose? For example, should the doctor tell a patient having a blepharoplasty that blindness is a recognized, though rare, complication of the procedure?

“I don’t know the answer,” says Dr Meyers, “but personally, I think that if a complication is so significant that a reasonable person should know it, I would tell them.”

Whose responsibility is it?

The primary responsibility for informed consent rests with the surgeon, Dr Meyers says. Though the focus tends to be on legal liability, the core concept is that the surgeon has an ethical obligation to disclose the risks of the procedure and ensure the patient is making an informed decision.

The American College of Surgeons in its Statement on Principles says, in part, “Patients should understand the indications for the operation, the risk involved, and the result that is hoped to obtain.” Most states have legislation or legal cases that determine the standard for informed consent.

Obtaining consent is not the facility’s nor the staff’s responsibility, Dr Makdessian says. The staff’s role is to:

• confirm that the patient has discussed the procedure with the physician
• ask if the patient has additional questions
• and if so, bring the questions to the surgeon’s attention.

Having patients sign consents in the preoperative holding area is discouraged, and some organizations do not allow it. Preferably, the surgical consent is signed in the physician’s office when the decision to have surgery is made.

Some circumstances may warrant modifying or amending the consent immediately before surgery. For example, just before a patient who will have a rhinoplasty is taken to the OR, she asks if the surgeon can remove a mole from her face. The consent can be amended to add this procedure, Dr Meyers notes. The surgeon should sign the change and document the reason for the change, noting the patient was not under duress at the time of signing.

If the consent is modified, the staff should make sure that is done under appropriate circumstances—the patient hasn’t been sedated or isn’t under duress, and that the amendment is properly documented and witnessed.

In the future, Dr Makdessian says there may be standard index cards that outline plastic surgery procedures, including information for informed consent, in simple and comprehensive language. Local, regional, and national plastic surgery societies are beginning to look into this project.

—Judith M. Mathias, RN, MA

Reference

Informed consent in a reality-TV world

The new wave of reality TV shows is bringing patients to plastic surgeons’ doors, some with high expectations.

On “Extreme Makeover,” patients have major flaws corrected before the viewing audience. “The Swan” goes a step further, as 17 made-over women compete against each other in a beauty pageant. Most outrageous of all—on MTV’s “I Want a Famous Face,” young people have nip, tucks, augmentations, and reductions so they can look like their favorite celebrity—including twins who both wanted to look like Brad Pitt.

Plastic surgery societies are raising alarm. “Famous Face,” in particular, sends “the wrong message,” says the society’s president, Robert W. Bernard, MD. “Plastic surgery was never intended to change who you are, and to believe surgery can achieve that will only lead to disappointment,” says the society’s president, Robert W. Bernard, MD.

The society advises patients considering plastic surgery to ask themselves:
- Am I focused on a specific feature or features that I would like to improve?
- Is my goal to look better, rather than different?
- Will I still be pleased if cosmetic surgery does not dramatically change my life or relationships?
- Have I considered, and accepted, that plastic surgery has risks?

“Extreme wakeup”

Patients coming in for an “extreme makeover” get an “extreme wakeup call” when they find out how much the procedures cost and how long it takes to recover, says John Grossman, MD, a plastic surgeon with offices in Denver and Beverly Hills.

He reminds patients that on TV, the shows pay for the surgery, and patients take 6 to 8 weeks off from work. In the real world, patients go home after surgery and take care of themselves. They may have to go back to work sooner rather than later to pay the bills.

Patient teaching

In selecting a surgeon, ASAPS advises patients not only to check a surgeon’s credentials but also to select a doctor who will take time to discuss the procedure in detail, including risks as well as benefits.

Though many patients seem to know a lot about plastic surgery because of what they see on TV and in magazines, Dr Grossman emphasizes teaching.

“It is below the standard of care to just say to a patient, ‘We are going to do your face-lift. Don’t worry about it, just go with the flow,’” he says.

All of his patients have a patient consultant and coordinator to give instructions and help answer their questions. He spends time with each patient, listening, giving them input, and helping them arrive at a decision.

Principles of informed consent

The American Society of Plastic Surgeons has developed this Statement of Principle on Informed Consent:

The American Society of Plastic Surgeons recognizes the physician-patient relationship as one of shared decision making. Through a process of communication and dialogue, the physician provides information that allows a patient and/or the patient’s authorized representative to make individual choices about his or her medical treatment.

Shared decision making is at the heart of the doctor-patient relationship and is based on the ethical principles of respect for individual autonomy and dignity.

The process by which physicians and patients make decisions together is informed consent. For any surgical operation or treatment, relevant information must be provided, discussed, and understood by the patient and/or the patient’s authorized representative. Relevant information for proper informed consent for any procedure may include:
- nature of the surgery or treatment
- indications for the treatment
- expected benefits
- consequences and side effects of the operation
- potential risks and adverse outcomes with their probability and severity
- alternatives to the procedure being considered and their benefits, risks, and consequences
- outcome anticipated.

The patient and/or the patient’s legally authorized representative(s) should sign a written consent form before any surgical procedures are performed.

Source: American Society of Plastic Surgeons. www.plasticsurgery.org

Teenagers and informed consent

Informed consent is especially challenging when a teenager requests plastic surgery.

Dr Grossman tries to get a sense of the psychiatric health of adolescents and their ability “to fully understand what they are getting themselves into.”

Both patient and parents must weigh the risks against the improvement in body image. The surgeon needs to assess whether the patient is self-motivated rather than having surgery to please a parent or friend.

He personally believes most routine aesthetic surgeries are inappropriate for adolescents, except for rhinoplasty and reduction for severely large breasts.

He discourages plastic surgery for adolescents and their parents because “it encourages an attitude that every...

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thing has a solution in life, and anything is purchasable if you can pay the price.”

A surgeon must obtain informed consent from both the patient and parents, have both teen and parents sign the consent form, and thoroughly document that the surgery was discussed with both parents and the adolescent. A problem could arise if the adolescent later claims to have been pressured, and there is a lawsuit that pits the patient against the surgeon and parents.

**How much is too much?**

Then there is the “plastic surgery junkie”—a few patients who have multiple surgeries, expecting every one to dramatically change their attractiveness, jobworthiness, or relationships.

ASAPS suggests surgeons tune in for clues such as whether:

- the patient has difficulty describing the desired change
- the patient is unreasonably bothered by what is objectively a minor imperfection
- the patient’s friends and family are supportive or opposed
- the patient appears depressed or excessively anxious
- the patient has a history of dissatisfaction with plastic surgery.

With such a patient, Dr Grossman tries to make the point, as gently and politely as possible, that the human body is not a lump of clay surgeons can form in any way they choose.

—Judith M. Mathias, RN, MA
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**At a Glance**

### NFPA code to allow hand-rub dispensers in hospital corridors

The standards council of the National Fire Protection Association, which sets fire safety standards used in 38 states, on April 28 announced amendments to the NFPA Life Safety Code effective May 5 that will permit health care facilities to install alcohol-based hand-rub dispensers in their corridors, the American Hospital Association reported.

Current fire codes have restricted hospitals’ use and storage of alcohol-based hand-rubs despite the Centers for Disease Control and Prevention’s recommendation that the hand-rubs be used to combat infections.

The NFPA approved the fire code revisions based on a fire modeling study commissioned by the American Society for Healthcare Engineering showing the dispensers can be installed safely as long as they hold no more than 1.2 L and are not installed too closely together or near electrical outlets.

More information on the NFPA announcement will be available at www.ashe.org.

### Ohio adopts statewide protocol for correct surgery

A protocol for preventing wrong surgery in Ohio should give surgical facilities in the state a leg up in complying with JCAHO’s “universal protocol” for preventing wrong surgery. The Ohio protocol was developed based on consensus of 20 organizations. The protocol and a poster for implementing it are at www.ohiopatientsafety.org.

### Open hernia superior to laparoscopic approach in study

Patients having open hernia repairs had significantly fewer recurrences (5%) than patients having the laparoscopic approach (10%), in a study released early by the *New England Journal of Medicine*.

Complications were more common in the laparoscopic group (39%) than the open group (33%). Patients who had laparoscopic surgery had less pain and were able to return to normal activities 1 day earlier. The study, conducted at 14 VA medical centers, followed nearly 1,700 hernia patients over 2 years.


### Leapfrog jumps ahead with new quality measures

Hospitals can expect to be measured on 30 quality indicators under the Leapfrog Group’s expanded program beginning in July. Leapfrog, a national consortium of Fortune 500 companies and other groups, added 27 measures to 3 existing ones in April.

Some are similar to the Joint Commission’s patient safety goals—wrong site/wrong patient prevention, verbal order readback, and identifying high-alert medications. Among others are asking patients to read back informed consent, pressure ulcer prevention, and appropriate use of antibiotic prophylaxis for surgery.

The three existing measures, in effect since 2001, are computerized physician order entry, referring to hospitals that meet volume standards, and staffing ICUs with critical care specialists.

In Leapfrog’s voluntary program, hospitals fill out a survey, then are scored and compared with other hospitals. About 1,100 hospitals have participated so far. Leapfrog shares responses with the public, and its employer members can use the results in insurance contracting and educating employees on how to choose hospitals.

—www.leapfroggroup.org

### Nurse who killed patients pleads guilty

Charles Cullen entered the ranks of the country’s most prolific serial medical killers April 29 when he pleaded guilty to killing 13 patients at Somerset Medical Center in Somerville, NJ. He also admitted to a death at Easton Hospital in Easton, Pa. He would not be eligible for parole for at least 127 years, the *New York Times* reported. Cullen has agreed to cooperate with prosecutors in 5 other counties where he worked has a nurse. He has said he killed as many as 40 patients.

In the New Jersey pleading, he acknowledged killing two patients in one day, a 38-year-old and an 89-year-old. He has admitted using digoxin and insulin as well as nitroprusside, norepinephrine, dobutamine, and Pavulon.

Somerset Medical Center likely will face a flurry of civil suits over the murders, 5 of which occurred after the hospital was first warned someone might be killing patients.

—www.nytimes.com

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