A Lean approach to turnover time: Drawing on solutions from the staff

THREE OR teams may think they’ve prepared every possible minute from turnover times between surgical cases. But Lean management is giving ORs more tools for spotting and eliminating every step or practice that does not add value to a safe turnover process.

The search for lost time between cases continues to be a focus as perioperative departments strive to make the most of their prime-time hours and reduce overtime and down time for surgeons.

A key tenet of Lean management is that ideas and solutions for eliminating waste come from front-line staff who do the work. Lean management draws from the well-known Toyota Production System, which fosters a culture of continuous improvement.

Performance improvement

Three ambulances are headed for the hospital with victims of a multivehicle accident. A fourth ambulance is also en route carrying a 52-year-old man with chest pain.

Calls come in from the EMS team, which begins streaming real-time vital signs and diagnostic information to the ED. Realizing multiple critically injured patients are on the way, the ED director activates the hospital’s “war room.”

In the war room, key personnel immediately start to coordinate activities. This high-tech control room brings together information from critical systems like the live stream of vital signs, ECG readings, and video of assessments by emergency responders.

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Editorial

There are good reasons to think about how patients experience your OR and your facility. It isn’t about private rooms and better food. The quality of their experience is fundamental to keeping patients safe.

A new analysis from Health-Grades finds hospitals with the highest ratings for nurse and physician communications have fewer adverse events on average. In one result, 27% more overall patient safety events happened in hospitals that were at the bottom for nursing reimbursement compared to the top 10% (www.healthgrades.com).

The quality of patients’ experiences is also linked with how well they comply with their treatments. And it’s what will cause them to recommend your hospital to family and friends.

Add to these reasons Medicare reimbursement and Joint Commission scores.

As if you needed reminding, patient experience scores, as measured by the HCAHPS survey, are part of Medicare’s new value-based purchasing program, which starts to affect reimbursement October 1, 2012.

Facilities are being scored on the Joint Commission’s patient-centered communication standards as of July 1, 2012.

The patient experience
What drives the patient’s experience?

Nursing care had the biggest impact on patients’ overall rating of a hospital in HCAHPS in a new study in the Journal of Nursing Administration (Wolosin R et al. 2012;42:321-325). To be specific: Each 1-point increase in the nursing domain score increased the odds of achieving an HCAHPS top-box score by 4.9%.

The patient’s room, physician’s care, and meals were also significant, “but nursing care clearly was the most important,” the authors say.

The conclusion: Hospitals would likely see their greatest impact on patient satisfaction by engaging in improving nursing care.

Perioperative nurses’ role
How can perioperative nurses help?

• Make sure staff nurses know that all of their patient interactions—how well they listen and give preop instructions—affect how patients perceive their overall care. They are also crucial to a patient’s recovery.

• Raise the antenna about patient literacy. It’s an overlooked problem. A lot of patients, probably most, don’t have a good understanding of their surgery and related treatments.

Tools for helping patients to understand their postop care are in the June OR Manager (“Overcoming low health literacy,” p 1). “Teach back”—asking patients to “teach” back to you what they’ve just been told—is well adapted to the fast-paced perioperative environment.

A teach-back toolkit is at www.ahrq.gov/qual/literacy/healthliteracytoolkit.pdf

If you haven’t already, it might be a good method to weave into staff orientation and ongoing competency evaluations.

—Pat Patterson
We’ve got your OR Manager webinars on record.

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I s your spark flickering? Maybe it’s dimmed in the face of the endless reports, e-mails, and urgent meetings you face every week. The to-do list seems endless. Next week’s priorities are overtaking this week’s, and they all seem to be in the wrong order.

Connie Merritt, BSN, RN, PHN, is all about helping managers reclaim their spark—whether it’s been snuffed by relentless change, difficult people, or multitasking.

In her talk, Raiders of the Lost Spark, at the OR Manager Conference October 24 to 26 at Caesars Palace in Las Vegas, Merritt will share techniques to help manage change, handle touchy topics, and deal with people dynamics.

The conference, celebrating its 25th anniversary, starts on Wednesday, October 24, with 9 preconference seminars. Following are the 2-day conference and exhibits.

Participating in the conference is the AORN Leadership Specialty Assembly.

The conference offers tracks for new perioperative managers, OR business managers, and ambulatory surgery center managers.

Moving to higher ground

Merritt says she first found her spark as a speaker when, after being a nurse in the ICU, CCU, and ED, she became a manager and saw that her colleagues responded to her talks on team building and leadership.

She’s gone on to become a popular life-balance expert, speaker, and self-described “recovering Superwoman.”

“We all experience change,” she says. “It can destroy our balance and hit at the core of our health, relationships, finances, and career.

“I’m on a mission to take these concepts and help people move to higher ground. That’s the caregiver in us who wants to be part of the solution.”

As part of her talk, Merritt will suggest a 4-step process for rekindling the spark. One tip—as author Jim Collins suggests; “Make a ‘let-go’ list of people, places, and things that can cause a spark to die out.”

Merritt is the author of Too Busy for Your Own Good (McGraw-Hill, 2009) and a contributor to the Taming Guidebook series, Chocolate for a Woman’s Soul, and other titles.

She volunteers at a therapeutic riding facility for disabled children and adults, which she calls “her current passion.”

Management Boot Camp

New for 2012 is an all-day Management Boot Camp on October 24 sponsored by the Competency and Credentialing Institute (CCI). The session is a kickoff for the CCI Certificate Program for Surgical Services Management. Boot Camp participants will complete 2 of the program’s more challenging subjects: Financial Management and Surgical Services Management.

For more information and to register, to www.ORManagerConference.com

Learn more about Connie Merritt at http://conniemerritt.com

Connie Merritt, BSN, RN, PHN

is the AORN Leadership Specialty Assembly.

The conference offers tracks for new perioperative managers, OR business managers, and ambulatory surgery center managers.

Reported and written by Joanne Oppenheim, OR Manager Conference, Las Vegas
Sinai Hospital of Baltimore faced a challenge. The block schedule was maxed out, even though new ORs had been added. There was a need to eke out every available minute. Despite efforts to improve turnover time, it had plateaued at 32 minutes on average for the 22 ORs. Sinai performs about 20,500 cases a year.

Call in the Time Busters—a Lean project team to trim turnover time. The project was partially funded by AORN.

Sinai’s leaders projected that even if only 25% of the opportunity for saved minutes was realized, the hospital had the potential to generate $1.9 million in additional revenue annually.

The OR management team had already addressed the usual snags, such as instrument reprocessing delays and outdated preference cards. Adding to the challenge, the postanesthesia care unit had moved, adding 8 minutes of travel time.

**Kaizen event for turnover**

Sinai’s Lean project centered on a kaizen event, a concentrated 5-day exercise with daily targets. The event, held in September 2011, yielded a streamlined process, standardized work roles, and a plan to roll the new process out to the staff.

(Kaizen, Japanese for “improvement,” generally means humanizing the workplace and systematically eliminating waste.)

“It’s not a formula but relies on the team’s experience and creativity,” explains Jerry Henderson, MBA, RN, CNOR, CASC, assistant vice president for surgical services.

**Internal or external?**

One focus of the Lean turnover project was to separate “external” from “internal” steps. That is, which steps are external to the turnover process and can be done while the previous surgery is in progress, and which steps are internal and cannot be done while the previous procedure is going on, explains Richard Rahn of the Leonardo Group, who consulted with Sinai on the project.

The kaizen team had about 12 members: circulating nurses, surgical technologists (STs), throughput technicians, an advanced practice nurse, perioperative managers, and staff from the central sterile department. Others, including anesthesia providers and infection preventionists, participated as needed.

The hospital’s president, Neil Meltzer, kicked off the event and attended the concluding presentation.

Here’s how the kaizen event went.

**Advance work**

To make the most of limited time, a core team did advance work:

- set goals and metrics (sidebar)
- video recorded 4 to 5 turnovers to document the current process.

The purpose of the videos “was not to put the best face on turnovers but to depict the truth of how it is actually done today,” Rahn stresses. “This lets us know where we are starting from.”

**Kaizen Day 1**

**Goals:** Learn Lean principles and methodology. Understand the current state of turnover time.

Reviewing the videos, the team observed:

- There were no set roles for activities.
- There was wasted motion, with some steps repeated by different people.
- Mistakes were made in wiping down equipment. Some equipment was wiped more than once, while other equipment was missed.

“We saw opportunities to standardize roles and define sequences,” says Rahn.

The group documented necessary turnover steps on sticky notes and began organizing them into a flow chart.
Kaizen Day 2
Goals: Create the ideal turnover steps:
• Define the roles, activities, and sequence of activities.
• Decide which internal steps could be converted to external steps.
• Assign responsibility for the steps.

An example of an internal step was returning the case cart from the previous procedure to sterile processing. In the old process, during turnover time, the ST pushed the cart to the elevator. The team decided this could be changed to an external step: The ST could place the cart from the previous procedure near the OR and push it to the elevator after the room was ready for the next procedure.

Examples of other ideas:
• Assign each turnover team member to a zone with a set of activities. “We found it was faster for 1 person to stay in a zone rather than to do 2 or 3 things haphazardly,” Henderson says.
• Stage a kit of gowns and cleaning supplies in a hallway closet for ready access.
• Install plastic flags, like those used in doctors’ offices, outside each OR as a visual cue. The staff member who enters an OR to start turnover flips the flag to indicate the room is already being cleaned.

Kaizen Day 3
Goal: Test the new process.

The team tested and video recorded the new process using an empty OR (the trauma room). One videographer was assigned to each team member.
“Everyone had a script, and we had a checklist for the circulating nurse and surgical tech,” says Henderson. “One person would read the checklist, and one person did the work.”

The process was repeated 4 to 6 times. “We learned each time,” she says.

For example, an ST noted he had extra time in his zone and said, “Why don’t I empty the trash in my area?” even though that wasn’t in his scripted tasks.

This single change trimmed turnover time by about 1 minute.

Kaizen Day 4
Goal: Document the new process. Develop a plan to roll out the process to the staff across multiple shifts.

To document the process, the team:
• created an Excel spreadsheet to show the process step by step
• video recorded the “perfect procedure” for each role so the staff could see the process in action
• discussed the training plan and materials.

Following up and sustaining the process can be at least as challenging as creating the new process, observes Henderson.

Kaizen Day 5
Goal: Present the results.

The best trial time for the new process was 11 to 12 minutes. Patient-out to patient-in time decreased from 32 to 24 minutes. Room-ready time was reduced from 29 minutes to 11:36 minutes. (Room-ready time is measured from the time the patient leaves the room until the room is ready for the next patient.) The team decided room-ready time was a more consistent interval to track than patient-out to patient-in time because it is the time on which

Continued on page 8
nursing personnel have the greatest impact, Henderson notes.

The final presentation illustrated the staff’s conversion to the Lean methodology. When a PowerPoint presentation failed, a team of staff nurses and STs seized the opportunity.

“They stood up and began evangelizing about the process,” Henderson says. “It was more powerful than if the presentation had gone smoothly.”

Future projects
The kaizen event brought to the surface other ideas for improvement.

Lean also fosters clean, well-organized workplaces through a method called 5S: Sort, Set in order, Shine, Standardize, Sustain. Orderly work spaces are safer and more efficient. But it takes staff time to achieve.

OR team leaders took the initiative to conduct a 5S for specialty supplies, deciding to come in on a weekend.

The cleaning and sorting have continued. The effort has paid off. “I feel better about how our OR looks than I have ever felt,” she says. Signs on the walls now show where equipment is to be stored, and outlines are taped on the floor.

Not only does the reorganization create a safer, more efficient work setting, it also addresses the Joint Commission’s concern about clutter.

Sustainability plan
Elements of the plan to hold the gains of the new turnover process include:

- holding regular kaizen meetings to review metrics and report results
- designating staff members as “process owners” who are responsible for maintaining standard work and continuous improvement
- conducting audits of the process
- including compliance with standard work in employee evaluations.

“If you’re not in a continual process of improvement and making efforts to meet regularly, chances are the process will degrade,” says Rahn.

Allaying staff concerns
A common concern staff have about Lean management is that they will have to work harder, and it might lead to layoffs. Those concerns must be addressed at the outset to engage the staff’s participation and enthusiasm, Rahn cautions.

A streamlined process might take less labor, but “our general recommendation is that you don’t use this as an opportunity to reduce staff,” he says. Instead, staff are redirected to patient care or quality improvement projects.

At Sinai, nurses are not unionized, but the OR throughput technicians are. Their functions include housekeeping, patient transport, and assistance with tasks such as gathering supplies and positioning.

Though some staff were apprehensive that they might be expected to work harder, they began to see that they were getting the same amount of work done but with fewer steps.

“That was an eye opener,” says Henderson.

Having the staff generate and implement the ideas was critical to the project, she adds. That not only elicited the best ideas but also kept them engaged.

“It’s the staff who do the work, come up with the solutions, and take the credit,” she says. “It’s not me, it’s not the consultant, and it’s not the management team.”

—Pat Patterson

Reference
Lean Enterprise Institute. What is Lean? www.lean.org
Restructuring circulator nurse role aids turnover

Second of 3 articles on applying Lean management to turnover time.

E fforts to weed waste from turnover time quickly took root in one 10-OR department. Within about a month after OR staff and certified registered nurse anesthetists (CRNAs) embraced the new process, turnover time decreased from about 26 minutes to about 20 minutes on average.

What were the barriers?
A team of managers and staff analyzed current process and identified a number of barriers:
• **Communication.** Communication among team members was not always timely. To encourage a quiet environment, there is no overhead paging system. Initially, pagers were distributed to turnover team members, but some pagers were turned off or unavailable. The wireless phone system didn’t have complete coverage. Staff members could not always be found when needed.
• **Patient readiness.** Patients sometimes did not arrive in a timely manner. Lab tests sometimes weren’t available. Some cases needed special preparations. Patient assessments had to be completed. Anesthesia providers required time to place lines and administer blocks.
• **Instruments and supplies.** These items were not always available.
• **Misconceptions.** Perceptions of turnover time differed. For surgeons, turnover time began when they finished with one patient until they could make the incision on the next. For managers and staff, turnover was from patient exit to next patient entry. For the project, turnover was defined as wheels out for one patient to wheels in for the next.
• **Staff.** Limited staff were available due to vacancies, patient transport needs, and other demands.

The improvements brought a change in culture that caught on quickly. Though the team had planned a 5-week roll-out, bringing 2 ORs on line each week, the new process took only 3.5 weeks to implement for all 10 ORs.

The CRNAs immediately adopted the changes and began spreading them to any OR to which they were assigned, Dangel-Palmer notes.

Freeing the circulator
A major change was restructuring the circulating nurse’s role to protect more of the nurse’s time in the OR to prepare for the next patient (sidebar).

Rather than accompanying the patient and CRNA to the post-anesthesia care unit (PACU), the circulator reports to the CRNA in the OR, who conveys the surgical report to the PACU nurse. The OR RN remains in the OR to close out the record and delivers specimens to the specimen room.

The nurse then goes to the preop unit to assess the next patient and confirm the procedure, returning to the OR to prepare for the next case. This gives the circulator the remaining time to set up for the case. At or before the 20-minute mark, the CRNA and a preop team member (perioperative assistant, RN, or unit clerk) transport the patient to the OR.

The streamlined process still

The parent Henry Ford Health System, known for its innovation, received the Baldrige National Quality Award in April 2012.

Continued on page 10
Performance improvement

Revised turnover process

Anesthesiologist
- Has prepared the next patient (assessment, nerve blocks, additional IV access).

End of case
- Staff transfer patient to bed. End of case is declared on pager system; all available staff report to room.
- OR RN announces time out of room and expected 20-minute return to room. All staff agree on time.
- OR RN remains in OR, completes care of any specimens, closes chart.
- Patient is escorted to PACU by anesthesia provider and any available assisting staff.

Between-case activities
- CRNA returns to OR to set up next case.
- OR RN goes to preop holding area to assess patient and confirm procedure.
- OR RN returns to OR to assist in setting up for next case. RN has 15 minutes of protected time to prepare the OR.
- CRNA goes to preop holding area to check on the next patient.
- With consent, H&P, and labs complete, the CRNA and team member move patient to OR in 20 minutes or less.
- Patient is greeted at OR door by OR RN with use of Virtual Ticket.*
- Handoff from CRNA to OR RN is completed before the patient is escorted into the room.

*Virtual ticket includes signed consent and updated H&P.
Source: Henry Ford West Bloomfield Hospital.

At the end of each case, on the dry-erase board the circulating nurse writes the patient’s exit time and the next patient’s expected entry 20 minutes later. This visual cue helps the team focus on turnover.

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maintains the nurse’s ability to assess the next patient.
“We feel that completing the assessment is super-important for all of our nurses and CRNAs, and we’re proud we are able to do that,” Dangel-Palmer says.

Adding visual aids
A dry-erase board in each OR helps the team focus on the turnover process (illustration). At the end of each case, the circulating nurse writes the patient’s exit time and the next patient’s expected entry time 20 minutes later.

For example, the nurse calls out, “Patient leaving at 9:00,” explains the OR manager, Deborah Gauthier, BSN, RN, CNOR. “The team’s expectation is to have the next patient in the room by 9:20. Visual aids work well—people see it, and they remember it.”

Improving communication
To be sure help is available at the end of a case, all staff members, including perioperative assistants (POAs), carry a pager.

When a case finishes, all available POAs go to the room to help, along with available nurses, surgical technologists, and clinical coordinators.

The team finds this approach works better than assigning POAs to specific rooms.
“...This has kept everyone on their toes,” says Margaret McInerney, MSN, RN, CNOR, OR education specialist. “It became the culture of the department that we are all responsible, and we all help each other out.”

Pulling the ‘andon cord’
In Lean manufacturing, each person is responsible for the precision and accuracy of his or her part of the process. On an assembly line, when a problem is spotted, any team member can pull the “andon cord,” alerting the leadership that a problem is about to occur. Help is sent to remedy the issue to keep the line from stopping.

Similarly, in the OR, a team alerts the leadership when a problem would cause turnover time to exceed 20 minutes. For example, an instrument set is not available, a patient is not prepared, or there is a last-minute change in the procedure.

The team’s clinical coordinator or the OR board runner is notified...
Creating a “visual workplace” is a principle in Lean management. Visual cues have been one solution for improving turnover time at Thomas Jefferson University Hospital in Philadelphia.

In a visual workplace, the goal is to make waste, problems, and abnormal conditions readily apparent so they can be addressed.

Eight ORs that perform primarily general and gynecologic surgery were selected for the Lean project. The health system has a total of 58 ORs.

The goal was to improve turnover time from an average of 47 minutes to 30 minutes and to reduce variation, notes Monica Young, DNP, MBA, RN, CNOR, senior clinical director of perioperative services. Turnover time is defined as wheels out (patient leaves the OR) to wheels in (next patient enters the same OR).

The project team included a certified Lean Master, Lean facilitators, nursing staff, a nursing assistant (NA), and managers.

The Lean leaders interviewed the staff, performed time studies and observations, and analyzed turnover time data.

Among solutions the team selected were to adjust nursing assistants’ hours and to use visual cues to aid turnover time, including a tablet computer for the OR charge nurse so she can monitor the status of cases from any location.

Nursing assistant roles
One issue the team identified was the need for a more structured role for nursing assistants. The assistants had competing duties, such as delivering specimens and transporting patients, which often took them off the unit. Plus, their break time coincided with the busiest time of the day for turnovers.

A suggestion was to make the nursing assistants members of a team so they would feel more valued, says the charge nurse, Debra Righter, BSN, RN.

The solution was to assign 1 nursing assistant to every 2 ORs instead of having all 4 responsible for 8 ORs.

“That gives more structure to who is assigned to each room and makes the nursing assistant feel more a part of the team for the day,” she says.

Break relief was adjusted to provide better coverage from 10 am to 2 pm.

Righter’s responsibilities were adjusted during mid-day, so she would be more available to allocate resources for turnovers.

Tracking cases by iPad
Righter, who covers 16 OR suites in 3 locations, now has an iPad to enable her to monitor cases in all of the locations.

“I can see what’s going on without being confined to a desk,” she says.

Through the iPad, Righter accesses a web-based tracking system that pulls information from the OR scheduling and anesthesia information systems.

Color-coded flags allow her to see how turnover times are tracking with the 30-minute goal. The flag turns green when a patient leaves the OR, yellow at 15 minutes, and red at 30 minutes.

“If it’s yellow, I can find out if there’s an issue with the patient, if the room is being cleaned, or if there is a problem,” she says.

Display screens are being installed so all surgical personnel will be able to view case status.

Continued on page 12
Other visual cues

Other visual tools aid turnover activities:

• Nurses designed a checklist for the OR door that lists standard equipment, such as a video cart, stirrups, or special padding. The nurse checks off what’s needed for the next case. The nursing assistant can then assemble the equipment without waiting for the nurse to say what’s needed.

• A magnetic board was installed so nursing assistants can indicate when they leave and return to the unit. Initially, the board wasn’t well received. Managers explained that the purpose was to help them get more resources to assist with turn-overs if several assistants were off the unit. The board also helps managers to document the need to adjust staffing during high volume times of the day.

The assistants “are more willing to utilize the board because they realized we were doing it to help them out,” Young says.

Tracking long turnovers

With the iPad, Righter can document turnover times that exceed 30 minutes so reasons can be analyzed and reports produced.

The reports are also helpful in responding to questions from surgeons. Managers could pull up a report to show that in some cases, 20 minutes elapsed after the surgeon left the room while residents were closing the incision. As a result, some general surgeons now stay in the OR to facilitate completion of the case.

The data also showed other reasons surgeons were delayed. They might not have finished a case in the previous room, or they might be marking the patient’s site in the preop area. Policy requires the surgeon to mark the site before the patient is brought to the OR. Anesthesia providers, in turn, were waiting for the surgeon to start preparing the patient for induction.

Outcomes

Gains were made, but there is more work to do. Median turnover time (wheels out to wheels in) decreased from 38 minutes to 36 minutes. Average turnover time was reduced from 47.17 minutes to 41.00 minutes. Variation was reduced from a minimum-maximum range of 25.48 minutes to 12.59 minutes, with the standard deviation reduced from 6.69 to 3.31.

Lessons learned

Young points to some lessons learned:

• Enlist strong individuals for the Lean team who can address pushback from peers when changes are introduced.

• Involve as many staff as possible in the decision making.

• Post turnover time data in a visible location so everyone can see it.

• Collect the right data. In addition to total turnover time, consider measuring increments such as room ready to patient in and patient in to incision as well as turnover time by physician and specialty.

• Distinguish between gaps in the OR schedule, such as including add-on cases, rooms that finish early, or a surgeon not ready for the OR, and turnover time, to avoid skewing the turnover time data.

—Pat Patterson

Performance improvement

Circulator nurse role

so he or she can help mobilize the necessary supplies, instruments, or personnel.

Sharing the data

Data on turnover time and other metrics are widely shared on bulletin boards and by other means. The data are reviewed daily to check for outliers. The OR’s turnover team committee meets monthly to review the results and make adjustments in the process when necessary, Mulcrone notes.

Reports are color-coded by service so each team can see how it is doing and compare notes with other services.

“We post the data, we send reports to our leadership—and we celebrate,” says Dangel-Palmer. “People need to be rewarded because we are really pushing them.”

Once the changes were in place, minutes were quickly trimmed from the turnover process.

The biggest change of all, she says, “is a change in culture where getting the patient into the OR in 20 minutes is everyone’s job.”

—Pat Patterson

Henry Ford West Bloomfield presented its project in a poster at the AORN Congress in March 2012 in New Orleans.

What’s in the OR Manager Toolbox?

Look in the OR Manager Toolbox for sample forms, policies and other helps.

You’ll find the Toolbox at www.ormanager.com.

Thomas Jefferson Hospital’s Lean turnover time project was presented as a poster at the AORN Congress in March 2012 in New Orleans.
Technology for surgery

**Intelligent OR**

Continued from page 1

The war room is the nerve center of the Intelligent Hospital, a demonstration project showcasing state-of-the-art technologies for integrating and delivering data on patient care and resources (sidebar, p 14).

In the war room, the team receives and acts on data on the incoming patients and current hospital operations, enabling them to set priorities, manage logistics, and communicate with key managers and clinicians.

They check on ED capacity and ICU bed availability. They view the status of OR cases and send electronic alerts to the OR manager and trauma surgeons.

When the victims arrive, those needing surgery are transferred to the OR. In the OR, the surgical team views their vital data on integrated boom-mounted displays (Skyvision platform from Skytron). The displays show critical information the team needs, such as data from the patient’s record, physiological monitoring, digital x-rays, and lab results.

Tapping a screen, the circulating nurse can route the images from any system, whether laparoscopic video, vital signs, and other sources connected to the platform, to any of the OR’s display screens for viewing by the surgical team.

When a surgeon needs to consult with an outside specialist, the nurse can route the image or video signal to the specialist’s office where he or she can call up the image on her PC and offer guidance back to the OR.

The applications may seem like StarTrek, but “all of these systems are currently available,” says Keley John Booth, MD, an anesthesiologist who organized the Intelligent OR display for the Intelligent Hospital demonstration at the 2012 Health Information Management Systems Society (HIMMS) conference in Las Vegas (www.intelligenthospital.org).

**Intelligent OR infrastructure**

The Intelligent OR is supported by a wired and a wireless network that enables integration of systems such as video signal routing, device control, RTLS (real-time locating systems), and RFID (radiofrequency identification) that can be used to manage workflow, the supply chain, and communications.

A hospital can customize the system by selecting the appropriate infrastructure, including hardware and software, and working with the vendor to develop business rules for its selected applications, explains Bryant Broder, senior product manager for Skytron, a sponsor of the Intelligent OR pavilion.

For technophiles, the infrastructure can include a number of types of systems: Infrared (GEN2 IR), WiFi Plus, Zigbee (wireless standard 802.15.4), RTLS, and passive RFID.

It’s estimated 10% to 15% of hospitals currently have RTLS or RFID systems, and that is expected to grow by 30% by 2015.

These are some examples of “intelligent” applications:

**Patient flow management**

A system that includes RTLS can help to manage logistics by tracking patients through “milestones of care.” Patients and staff can wear RTLS locator tags that automatically signal when they enter or leave an area, explains Mary Jagim, BSN, RN, CEN, FAEN, chief nursing officer for IntelligentInSites. The company provides a flexible RTLS software.
What is the Intelligent OR?

The Intelligent Hospital is a demonstration project showing how clinical devices and systems can be brought together to provide real-time information on patient care and resources.

The Intelligent Hospital was a 10,000 sq ft pavilion at the 2012 Health Information Management Systems Society (HIMSS) conference in Las Vegas.

The systems, integrated with both wired and wireless networks, deliver information in multiple ways, including visual displays, smartphones, and other handheld devices.

The project features RTLS (real-time locating system) and RFID (radiofrequency identification) technologies.

The systems can be both distributed and managed through a central communication center called the “war room.”

Included in the pavilion were an Intelligent OR, ICU, emergency department, and general patient units.

Intelligent OR

The Intelligent OR has the traditional infrastructure, including operating tables, surgical lights, equipment booms, and monitoring systems, as well as an integrated information infrastructure.

Physiological monitors, information systems, laparoscopic surgery systems, the electronic health record, and other clinical applications are integrated so images and data can be displayed on boom-mounted screens.

RTLS and RFID enable the identification and tracking of staff, instruments, medications, and supplies, providing for dynamic reporting on these assets.

RTLS tags, data is captured automatically and can be collected by any electronic system, including the patient’s electronic health record (EHR).

This automatic communication “can be used to drive the next step in the process,” says Jagim. “It eliminates the waiting until someone has time to enter a time or a message. It’s a more consistent process for managing patient flow.”

Equipment management

A system with RTLS locator tags can be used to track patient care equipment, such as IV pumps. A nurse who needs a piece of equipment can pull up a screen on the OR PC and search for RTLS-tagged equipment in the asset management software, which will display where the equipment is currently located.

Continued from page 13
Temperature monitoring
To aid compliance with temperature monitoring, RTLS tags can be mounted in refrigerators, freezers, or storerooms and programmed to report data to a central location. An alert can be sent if the temperature is outside a specified range, and reports created for documentation purposes, Broder explains. If a problem occurs, and corrective action is needed, the correction can be reported automatically, such as, “Biomedical technician Jones replaced the condenser on June 4, 2012,” he notes.

Inventory management
RFID systems can aid in supply management, collecting data on supply usage at the point of use and generating automatic orders based on business rules.

Logi-D (www.logi-d.net), a company specializing in hospital logistics, offers a 2-bin replenishment system with RFID technology, eliminating the need for manual supply counts. When the primary bin is empty, the user transfers its identification tag (with its RFID transponder) to a nearby wall-mounted RFID “reader” board. This automatically triggers a replenishment request to the materials management information system. Supplies are then drawn from the secondary bin until the next delivery.

RFID can also be used to manage high-value or consignment items. These items are tagged with a label with an RFID transponder during the receiving process. Procedure rooms are equipped with “intelligent receptacles” that capture data when a clinician disposes of the item’s empty RFID-tagged package in the receptacle. The system eliminates data entry and aids charge capture.

Logi-D recently introduced video and voice-recognition technology, which, combined with RFID, automates demand capture and streamlines case picking.

Instrument management
Just entering the US market is a Smart Table that can be used to account for RFID-tagged surgical instruments. The system’s software is programmed to identify the instruments placed on the table, record when an instrument is removed, and account for instruments that are replaced.

The Smart Table uses small UHF-passive RFID chips attached to the instruments; the instruments’ metal extends the read range for the chips. The table has an RFID reader with a localized zone.

Before the procedure, the RFID-tagged instrument tray is set on the Smart Table surface, and the system records the tray and its associated instrument inventory. Instruments can be arrayed on the table, and an updated preop instrument count is automatically conducted. Any discrepancies between the count and tray inventory are displayed on monitors by the accompanying software application.

After the procedure, the instruments are read after being set back on the Smart Table or on an optional separate table to provide the postop count.

The Smart Table costs around $10,000, and RFID tags for instruments are $2 or more, depending on the quantity, says Tom Manzagol of RFID Global Solution (www.rfidgs.com), the company that provides the system. He says the tags, which are small ceramic disks applied with epoxy, have been tested to withstand several thousand sterilization cycles. The system can also be used for tracking instruments through reprocessing and could be used for unique identification of individual instruments.

Bigger role for mobile devices
Dr Booth predicts that tablet computers and smartphones will start to replace some of the lumbering COWs (computers on wheels) and even WOWs (wireless computers on wheels).

“These tablet devices are going to allow us to do everything a WOW can do on a lightweight platform,” he says.

Challenges remain for security, compatible software, and batteries that enable a longer-lasting charge.

“We are going to see leaps to the point where mobile technology becomes a mainstay,” he says, noting that “dozens of vendors present at HIMSS are pushing the boundaries.”

There still is work to do.

“We haven’t seen the killer implementation yet that really shows how you can integrate the EHR with a mobile platform in a way that makes sense and is user-friendly,” he says.

—Pat Patterson

For more, visit www.intelligenthospital.org
A patient arrives for surgery. As soon as she checks in, she receives a wristband with a small locator tag that monitors her progress as she moves through the surgical process.

Behind the scenes, the tag is signaling the surgical department’s real-time locating system (RTLS), which sends notices to OR personnel about the patient’s status and collects data that can be analyzed later to improve patient logistics.

The 23-OR department at Lehigh Valley Hospital, Allentown, Pennsylvania, has been using the RTLS from Awarepoint since 2007 (www.awarepoint.com).

The system provides detailed data that wasn’t available with manual entry of time stamps, says Brian Leader, MS, MBA, vice president for perioperative services and the orthopedic service line.

“It has given us the data to prove our theories about what we thought was going on and helped identify opportunities to address that,” he says.

In one example, turnover time was trimmed by 7 to 10 minutes by changing the sequence of activities for circulating nurses. Data showed nurses were spending more time in the presurgical process between cases than originally believed.

Patient process

Here’s how the patient-tracking process works:

- After a patient receives the wristband with locator tag in the surgical reception area, the RTLS system sends a message to the surgical staging area that the patient has arrived. No phone call is needed.
- The RTLS system automatically records the patient’s arrival in the staging area based on the tag’s movement into the area. The nurse in the staging area is able to view a summary screen with the patient’s information. If care milestones, such as the anesthesia consent, are incomplete, the nurse initiates an RTLS system alert to the appropriate clinicians. Alerts are also displayed on screens throughout the perioperative departments.
- When all preoperative milestones have been met, and the patient is ready for surgery, the OR staff is notified through the system, and the system records the patient’s arrival in the OR. During surgery, the patient’s wristband is removed and clipped to the chart.
- In the OR, the circulating nurse accesses a screen with the patient’s record, which includes a ribbon with time-stamp buttons. The nurse taps the buttons to record intraoperative events, such as start of prep, surgery start, and so forth. No keyboard entry is required.
- During the case, the nurse can view the status of to-follow patients assigned to the same OR and can initiate notices for followup by the appropriate clinician.
- At the end of the case, the circulator uses the touch screen to alert the charge nurse in the postanesthesia care unit (PACU) so a recovery bay can be prepared. At the same time, the OR turnover team is alerted so they can begin turnover activities.
- When the PACU bay is assigned, a notice is automatically generated for the OR. If the bay is reassigned, the RTLS system automatically displays the new assignment. Again, no phone calls are required.
- Tracking ends when the patient leaves the perioperative department.

Data benefits

The data the RTLS system collects has 2 major benefits, Leader says.

- real-time simultaneous communication about patient status and location to aid the day-to-day care processes
- data and time stamps recorded by the tags to aid analysis and fine-tuning of processes.

“One “aha moment” occurred when analysis showed circulating nurses were spending a lot of time between cases in the staging area completing the preop checklist and other steps, leaving them too little time to set up in the OR.

To shorten turnover time, a new process was adopted in which the circulator, after giving report to the PACU nurse, goes to the staging area to see the next patient and then goes back to the OR to complete the setup.

“This new process gets the circulating nurse back to the OR as quickly as possible,” Leader says.

Another benefit of the data is...
determining the length of stay in the PACU and analyzing patterns of when patients are held in the OR. To help relieve bottlenecks during peak times, a new process allows patients who meet PACU discharge criteria to be transferred back to the presurgical area until a bed is ready on a postop unit.

**RTLS infrastructure**
Lehigh Valley’s RTLS system uses a wired infrastructure. More advanced wireless options are now available. The RTLS tags automatically send wireless signals to software that records patients’ locations and the timestamp data.

Leader estimates installation of the hardware and software cost about $500,000, noting the price might be less today because of competition and technological advancements.

“The system has done so much for us,” he says, adding that “a different institution might want to see more of a hard ROI (return on investment).

**Realizing the benefits**
“We were interested in it for better communication and workflow, which are sometimes difficult to quantify, and we have definitely realized those benefits.”

As with any technology, he stresses, the system requires time and resources to get the maximum benefit. Resources must be allocated to analyze the data the system collects and use it to make improvements.

“You have to have people who are engaged with the system and want to continually enhance it,” Leader says. “We’re fortunate to have a team that has bought into it.

“You can’t simply plug it in and hope it will improve your processes.”

**Thinking about wireless systems? Consider these tips from an expert**

Are you considering wireless technology for tracking patients, staff, equipment, or supplies?

Expert tips are offered by Rick Hampton, wireless communications manager for Partners Healthcare. The Boston-based network includes Brigham & Women’s Hospital, Massachusetts General, and affiliated facilities.

Many hospitals are weighing decisions about these technologies, which include RTLS (real-time locating system) and/or RFID (radiofrequency identification).

**Involve IT, biomed early**
Hampton strongly recommends involving your IT and biomedical engineering departments before talking with vendors.

“If you don’t, you might buy a system that violates your organization’s security rules or is incompatible with other systems,” he says. The OR’s plans should be part of a strategic plan for wireless technologies, ideally, for the entire hospital.

**One size does not fit all**
In a wireless network, all technologies that use it share its bandwidth. Consider how adding a new technology could affect the performance of others using the system.

“There are no one-size-fits-all technologies. Wireless is always a compromise,” Hampton says. “You really need to plan.”

For example, an RFID system designed to have a high degree of accuracy with frequent signals, such as Wi-Fi documentation of patient data, might adversely interact with other systems using Wi-Fi, such as OR voice-over IP phones or video streaming.

Overtaxing the system is more likely in hospitals with lots of applications. Proper planning allows IT and biomedical engineering to install and design the wireless networks from the beginning to support as many systems as possible and avoid redesigning them with each new technology purchased.

**Don’t overlook security issues**
In most cases, RFID systems don’t transmit sensitive information. But some wireless RFID systems have potential to create a “back door” into a secure network.

“That’s our number one concern—preventing holes in our firewalls,” Hampton says. “Much of RFID came from other industries like retail and manufacturing where security is not nearly as critical.”

RFID systems that use one-way transmission to dedicated receivers are less of a threat than those that transmit using the IT Wi-Fi network. Proprietary RFID systems that use 2-way transmitters “are particularly problematic,” he says, because a hospital doesn’t have the means to detect an attack.

If your facility is audited for compliance with patient privacy laws, regulators will expect to see an audit trail showing the hospi-

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tals has determined that such systems are secure.

“That can be difficult if you don’t get documentation from the vendor on how its system meets your security requirements,” he says.

With any wireless RFID system, especially proprietary ones, he says he would expect the manufacturer to provide a risk management analysis of security risks and how they are mitigated. Each organization then has to weigh the risks versus benefits.

Plan strategically
Before talking with RFID vendors, define the problems you want to solve. For each problem to be solved, create a use case with a list of requirements, description of work flow, and desired outcomes. Then ask if the new technology is the best approach, Hampton suggests.

“RFID is the latest and greatest solution. It doesn’t mean it’s always the best,” he says.

A variety of technologies are available for determining location and identification of items, each with their strengths and weaknesses.

“You should match the technology to the use case, not the other way around,” he says.

If you want to track mobile equipment, for example, a number of systems are on the market. For temperature monitoring of refrigerators and freezers, an alternative may work just as well because these are not mobile. Uses that require a high degree of accuracy for documentation, such as tracking patient treatments or identifying all equipment used on a particular patient, “turn out to be fairly difficult,” he says.

In selecting a vendor, he adds, be aware that a vendor with hardware that meets your needs may not have software that works well and vice versa. You may need to mix and match.

Interference
Under normal circumstances, Hampton says he wouldn’t expect interference to or from an RFID system. Still, the potential exists, and rare incidents have been reported.

There are no standards or certifications that show an RFID system will not cause interference, he notes. There are, however, standards that show medical equipment is manufactured to minimize susceptibility to interference; IEC 60601-1-2 is one such standard.

“Be wary of companies claiming their RFID systems comply with any of these standards; this indicates they generally don’t understand interference and could be of limited help if you do have problems,” Hampton says.

Don’t expect to trial
Don’t be surprised if RFID vendors tell you they don’t do pre-purchase trials or pilots, Hampton notes. Many vendors now expect the hospital to simply purchase the equipment and install it.

“Doing this means you won’t know until after signing a purchase contract that the system may not work,” he says. If that’s the case, he advises the hospital to include a strong nonperformance clause in the contract.

—Pat Patterson

Lean boosts OR morale, productivity

Lean management in a teaching hospital’s otolaryngology OR improved efficiency, morale, and finances in a study from the University of Michigan (U-M), Ann Arbor. After 18 months:

- turnover time (from exit of one patient to arrival of the next) fell by nearly one-third to 29 minutes
- turnaround time (time between final dressing on one patient to incision on the next) dropped by 20% to 69 minutes.
- morale, teamwork, and effective problem-solving rose by more than 20%
- the number of cases finishing after 5 pm, requiring overtime pay, was cut in half.

Parallel activities
Among the process changes was performing more turnover activities in parallel. Automated pages are now sent to the OR cleaning staff when the surgical dressing is complete. Automated pages are also sent to anesthesia and surgery team members when room cleaning is complete but before instruments are opened for the next case.

A new document type was created in the electronic medical record to make it easier for preop nursing staff to find the history & physical and other documentation.

There was no evidence that the focus on efficiency reduced the value of training for surgical residents, the authors reported.

They say the results, if expanded to all of U-M’s 35 ORs, could create 6,500 hours of capacity annually, with cost savings and potential for new revenue.

—Pat Patterson

Have an idea?
OR Manager welcomes your ideas and contributions for articles. Contact Pat Patterson, editor, at ppatterson@accessintel.com.

Reference
Technology for surgery

Workflow support in new Johns Hopkins ORs

Staff in the cardiovascular OR area of the new Sheikh Zayed clinical tower at the Johns Hopkins Hospital in Baltimore will be able to locate certain equipment via computer and use a Skype-like camera system to share images of instruments and supplies with the sterile core and sterile processing unit.

Those are some of the technologies to aid workflow and communication for surgery at the new hospital, which opened May 1, 2012. The facility has two 12-story towers on an 8-story base with 560 private patient rooms and 33 ORs.

The Johns Hopkins Heart and Vascular Institute combines cardiac, vascular, and cardiac interventional services on one floor of the new building. The institute has 6 cardiovascular ORs, 2 hybrid rooms, 5 cath labs, and 4 electrophysiology labs in addition to the cardiac care units and ICUs. A common preop and recovery unit serves the new ORs and interventional rooms.

The OR nurse manager, Patti Wieczorek, MSN, RN, CNOR, described for OR Manager the technologies that will aid the institute’s workflow and logistics.

Real-time locating system

A real-time locating system (RTLS) with radiofrequency and infrared technology can track equipment through the facility. In the ORs, specific equipment, such as pacemakers and equipment needed in emergencies, will be designated for tracking.

It will be a change for the staff to be able to look up equipment in the computer rather than going to hunt for it, she notes. The system will be tested in the new building to be sure there are not dead zones, which turned up during a trial in the old facility, she adds.

Some OR staff, such as transporters, will wear RTLS locator tags. With the tags, they can be contacted in case there is a change of plans, such as the need to pick up a different patient.

In-house mobile phones

Instead of overhead paging, staff and physicians can call and text using an in-house wireless mobile phone system (Ascom, www.ascom.com).

On the inpatient units, patients and families will be able to call their assigned nurse directly. The phones cannot be used to call outside the system.

In the ORs, overhead paging is reserved for emergencies, such as a cardiac arrest, when a number of personnel must be summoned quickly.

Room-monitoring camera

A static camera in each OR allows coordinators at the control desk to check on the progress of cases. At the end of a case, they can deploy staff to aid turnover. In an emergency, they can quickly see what rooms are available.

Visual displays

Time stamps in the electronic documentation system allow the staff to key in time segments, such as patient in OR and case end, driving a visual display of case status throughout the department. In the waiting room, families will receive a code that allows them to monitor the status of their loved one’s surgery via a color-coded bar on a screen.

What’s that instrument?

A web-cam type system will enable the OR, sterile core, and sterile processing department to exchange images of instruments and supplies. That will aid communication among these staffs, which often use different terms for the same item.

“It’s like Skype. We can talk to

Continued on page 20
Meta-analysis finds no benefit for laminar flow in total joints

Installing new ORs with laminar air flow is a waste of resources, say authors of a new meta-analysis of 10 years of research on use of laminar air flow during total hip and knee replacements.

Moreover, they say, it might be worthwhile to investigate replacing laminar flow systems in existing ORs with conventional ventilation.

In the analysis of 5 large studies that included 195,000 patients, no individual study found a significant benefit for laminar flow in preventing severe surgical site infections (SSI). Three studies actually found higher SSI rates for total hip replacement in ultraclean ventilated ORs.

Overall, the relative risk for a severe SSI associated with laminar flow was 1.36.

Laminar flow is widely used. In a survey of 295 hospitals in the US reported in 2005, more than 75% of total knee replacements, especially in high-volume centers, were conducted in ultraclean ventilated ORs.

Why higher SSI rates?
It’s unclear why laminar flow-equipped facilities might have had higher SSI rates, but it could involve issues such as surgical practice that are unrelated to the ventilation system, says a related editorial.

The main explanations for higher SSI rates have been the improper positioning of the OR team in the air flow and lower tissue temperatures in the surgical wound. Studies have shown normothermia is important in the prevention of SSI.

Early studies of laminar flow that showed a benefit had serious limitations, the researchers note. ❖

Reference

GI groups’ statement on capnography contrasts with ASA

Capnography use for moderate sedation in adults having upper GI and colonoscopy procedures has not been shown to improve patient safety or outcomes and significantly increases costs, 3 GI societies say in a statement.

The statement is in contrast to the American Society of Anesthesiologists’ (ASA) Standards for Basic Anesthetic Monitoring, which were revised in 2011 to recommend capnography for moderate or deep sedation.

The GI associations say there is no data supporting the ASA recommendation for use of capnography during endoscopy in adults having moderate sedation. They say the data ASA used is from the pediatric literature or from studies of patients having advanced endoscopic procedures with deep sedation.

Support for collaboration
They add that adopting the standards will add unnecessary cost, inefficiency, and waste.

The statement supports collaboration with ASA to develop definitions, recommendations, and further studies to develop an evidence-based standard.

The statement was issued by the American Association for Gastrointestinal Endoscopy, the American College of Gastroenterology, and American Gastroenterological Association. ❖

The statement is available at www.gastro.org/practice/resource-library/guidelines/Capnography_for_Moderate_Sedation.pdf
A safer, faster way for postoperative x-rays

With patient safety as its primary goal, the University of Michigan Health System has created a new process using bar-coded sponges and electronic radiology orders to ensure no items are unintentionally left in a patient during surgery. Electronic orders provide for a standardized process that not only is safer but also saves 15 to 20 minutes in OR time.

“Having a surgical item left in the patient is something that should never happen,” says Ella Kazerooni, MD, MS, professor of radiology and associate chief of radiology.

“Unfortunately, in complex and emergency cases, in particular, or in larger patients, items are more likely to be left behind, and we want to do everything we can to prevent that.”

Collaboration is key
Though recognizing there was technology that could assist in preventing a retained item, “we also recognized that technology alone isn’t the answer,” says Shawn Murphy, MS, BSN, RN, CNOR, director of nursing OR/PACU and associate hospital administrator. Also important, she says, were collaborative relationships, team building, standard work processes, education, and comprehensive policies.

The U-M Health System, with 27 ORs, uses bar-coded sponges (SurgiCount Safety-Sponge System, Irvine, California), which are scanned before the sponges are added to the sterile field and when they come off. The sponges have radiopaque tags that allow them to be seen on an x-ray.

“The bar-coded sponge system can alert the surgical team to a sponge that is not accounted for, but an x-ray is still needed to determine if that sponge remains in the patient,” says Murphy.

Automating radiology orders
“Our top challenge in radiology was to speed up the process of taking an x-ray and communicating results to the surgical team,” says Dr Kazerooni.

Steps in the automated ordering process include:
- When the OR team finds a sponge, instrument, or needle is missing, the circulating nurse enters an order for an x-ray in the hospital’s computerized order entry system.
- The order shows up immediately in the electronic work queue in the radiology department. The circulating nurse no longer has to fill out a requisition, call radiology, or have someone deliver the order to radiology.
- The order shows up immediately in the electronic work queue in the radiology department. The circulating nurse no longer has to fill out a requisition, call radiology, or have someone deliver the order to radiology.
- All x-ray images are digital and are sent immediately to the PACS [picture archiving and communication system], where they can be viewed.
- After the x-ray is read, the radiologist calls directly into the OR and talks with the surgeon on speaker phone rather than writing the result on paper that is faxed or hand carried to the OR.

Standardized order
A benefit of the automated system is a standardized x-ray order that requests specific information: the type of surgery, what item is being looked for, and the phone number of the OR.

“The electronic order accomplished several things,” says Dr Kazerooni. “It gets the request to radiology quickly, it relays the correct information so the radiologist knows specifically what to look for, and it gives a specific number to call with the x-ray findings.”

The previous paper order only requested an intraoperative x-ray to rule out a foreign body. Radiologists often didn’t know what foreign body they were looking for or exactly where, says Dr Kazerooni.

She estimates the electronic order process saves 15 to 20 minutes of OR time, which reduces the time a patient is under anesthesia, helps reduce delays, and decreases OR time charges.

Saving OR time
A previous obstacle to x-rays before electronic orders were introduced was that surgeons thought the process took too long and weren’t willing to wait for x-ray results before closing the incision or moving the patient from the OR.

“We had to prove we could turn this around quickly so we could add value to their work flow and patient care.

“We did that, and now they don’t have to wait long to get the information they need while the patient is still in the OR,” says Dr Kazerooni.

—Judith M. Mathias, MA, RN


Patient safety
A systemwide focus on supply chain management is helping Sutter Health, a large, Sacramento, California-based health system, to improve its financial performance by adopting best practices and taking a contemporary approach to strategic sourcing, value analysis, and logistical support.

The target: Trim $200 million from expenses by 2012, and they’re on track. Perioperative services has been an active participant.

Executives have said the cuts are needed to prepare for more publicly insured patients as federal health care reform kicks in, plus to respond to customer complaints of high prices. Federal health care reform, if it goes forward, will expand eligibility for Medicaid and offer subsidies to low and middle-income customers through new health insurance exchanges.

“Our senior management saw this coming and started preparing about 5 or 6 years ago,” says Robert A. Matevish, regional director for supply chain services for Sutter Health’s West Bay region.

Sutter Health has 25 hospitals, 20 large medical groups, and other entities in northern California and Hawaii, with about $8 billion in revenue annually and total supply chain spending of about $1.5 billion a year.

The vice president for supply chain, Dennis A. Maher, hired after a national search, restructured the division, created system-level strategic sourcing, and began coordinating efforts of the affiliate hospitals, including setting up 30 to 40 value management teams for different specialties. The reorganization created a regional focus on supply chain led by 5 regional supply-chain directors with support from the central sourcing and operations/processing divisions.

“The goal was to bring the supply chain as close to the customer as possible,” Matevish says.

Matevish began working closely with perioperative nursing directors in his region, including Surani Hayre-Kwan, MSN, RN, FNP, previously director of surgical services at Sutter Medical Center of Santa Rosa and now executive director of operations for Sutter Pacific Medical Foundation. These are some key initiatives.

Seeking closer management of physician preference items like orthopaedic implants and cardiovascular devices, Sutter Health hired experts with clinical and business backgrounds to lead the projects.

Together, 3 small hospitals in their region saved $2 million on total joint and spinal implants. The approach includes developing formulary pricing and sharing data with the physicians. The data gives surgeons feedback on implant pricing and other aspects of their practice, including their OR and anesthesia times.

Under the formulary approach, capitated prices are set for implant components and constructs. Any vendors surgeons want to use who agree to the pricing can participate.

“For the first time, we have provided the physicians with information they have not had before,” Matevish notes, noting that some were shocked to see that their costs were twice as high as some of their colleagues’. That has helped in enlisting their support.

Strengthening value analysis
Matevish and Hayre-Kwan forged a partnership to make Sutter Santa Rosa’s value analysis process more robust.

“We had the right concept, but we didn’t follow through, particularly from the purchasing end,” Hayre-Kwan says.

Vendor representatives were frequent visitors in the OR, where they interacted with nurses and surgeons. As a result, products were brought in without sufficient review.

The solution: a “SWAT team”—a work group of critical department heads, including surgical services, who agreed on the terms of engagement with sales personnel. They adopted a policy that managers, staff, and physicians would no longer talk to vendor reps on the patient units. All product conversations would start with the value analysis process.

A credentialing process was set up for vendor reps, a step many ORs have taken. Vendors must meet certain requirements, including a background check, up-to-date immunization records, and safety and privacy education. When they come to the OR, they must sign in using a barcode scanner.
Managers know that when a surgeon or staff member requests a new product, they are to contact the materials management department.

“Materials management does due diligence and talks to the reps,” explains Hayre-Kwan. Materials management personnel determine if the hospital already has a similar device and evaluates the cost and impact on reimbursement. They then present their analysis to the value analysis team. If the device seems promising, the team may approve a 1- to 2-month trial to gather feedback and then make a decision.

**Standardizing equipment**

Systemwide standards were established for 50 types of equipment that have helped to economize. A value analysis team with representatives from the clinical, biomedical, and supply chain departments reviews equipment requirements, manufacturers, and market trends before sending requests for proposal (RFPs).

“That has saved so much time, energy, and money because it avoids duplication,” says Hayre-Kwan. The program applies to a range of equipment from small items like telemetry-lead pads up to MRI units and linear accelerators.

**Reprocessing single-use devices**

A systemwide initiative to reprocess single-use devices like bits, burrs, and trocars has gained traction. Reprocessing, which can yield big savings, entails sending single-use surgical devices that can be reprocessed, such as sequential compression devices (SCDs) and trocars, to a third-party company that meets FDA requirements.

In a sign that reprocessing of single-use devices is here to stay, original device manufacturers that fought the trend are now embracing it. Ethicon Endosurgery completed its acquisition of reprocessor SterilMed in November 2011. Stryker previously acquired Ascent, a major reprocessing company, rebranding it as Stryker Sustainability Solutions.

**Beyond turf wars**

With 30-plus years in the supply chain field, Matevish says he thinks Sutter Health’s progress on supply costs has gained from the collaboration of supply chain and clinical colleagues.

“People rely on each other’s strengths,” he says. “Sometimes there are conflicts. But the cost pressures are so significant that I think people are willing to do what’s necessary.”

Where will the next level of savings come from?

“I think we’ve done a great job of contracting and developing a collegial approach,” says Matevish. “I think the next frontier is going to be utilization. The cheapest supply or service in my mind is the one that never gets used.”

He adds there also will always be opportunities for system redesign, such as improving paperwork and par optimization.

“We can’t forget that in addition to creating savings, we are in business first to serve our end users.”

—Pat Patterson

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For the first time, cardiac catheterization laboratory personnel have a document defining best practices, including time-outs, infection prevention, and preprocedure checklists.

The statement, from The Society for Cardiovascular Angiography and Interventions (SCAI), issued in March 2012, is the first to represent consensus on the operation of cath labs, the lead author, Srihari S. Naidu, MD, FSCAI, an SCAI trustee, told OR Manager.

The statement can assist in meeting Joint Commission requirements. It also provides a benchmark that cath labs can use for their current practices and for setting future goals to elevate the standard of care, notes Dr Naidu, an interventional cardiologist and director of the cardiac cath lab at Winthrop University Hospital, Long Island, New York.

Best practices are divided into those that apply before, during, and after the procedure, including follow-up evaluation.

Time-outs new for cath lab
Though operating rooms routinely conduct time-outs, cath labs generally have not. The time-out is a final check before each procedure to verify the correct patient, procedure, and site.

The reason, says Dr Naidu, is that in the cath lab, procedures are performed on only one organ, the heart.

“For example,” he says, “it doesn’t matter which leg we use to access the heart, and we often change the location during a case, so there is no need to mark the site.”

Still, questions about the Universal Protocol arise during Joint Commission surveys, he says.

To address that concern, the consensus statement includes a streamlined time-out process that addresses issues of concern to cath lab personnel, such as identifying the appropriate patient and appropriate procedure, Dr Naidu says (sidebar).

Preprocedure checklist
The consensus statement recommends a preprocedure checklist and provides an example, which includes:

• planned procedure
• history and physical exam
• history of prior percutaneous coronary intervention or coronary bypass
• candidacy for drug-eluting stent
• allergies
• medications
• informed consent
• health care proxy
• sedations, anesthesia, and analgesia
• results of lab work and studies.

“Most cath labs don’t have a preprocedure checklist,” says Dr Naidu, noting that the experts preparing the statement tried to make the checklist as relevant to their practice as possible without unnecessary elements.

“We tried to cut through to exactly what we think is reasonable and appropriate,” he says.

Where the checklist is completed depends on what route the patient comes into the hospital, says Dr Naidu. For the major-

Sample cath lab time-out checklist

A streamlined time-out is outlined.

The sample cath lab time-out checklist includes the following:

• All team members must be present for the time-out.
• The time-out must take place immediately before vascular access is obtained.
• The physician taking ultimate responsibility for the procedure should lead the time-out and ensure each of the following items is announced:
  1. Patient’s name and medical record number
  2. Procedure to be performed (eg, left heart catheterization)
  3. Route to be used (eg, right femoral artery)
  4. Confirm availability of needed equipment or alternatives, including intended stent type
  5. Patient’s allergies and premedication if appropriate (eg, heparin-induced thrombocytopenia)
  6. Special laboratory or medical conditions (eg, elevated INR, chronic kidney disease).

Source: The Society for Cardiovascular Angiography and Interventions (SCAI).
Medicare rules allow broader use of nonphysicians

Hospitals now have the flexibility under federal law to include practitioners other than physicians on their medical staffs. That’s one provision of Medicare’s revised Conditions of Participation (COP) for hospitals and critical access hospitals, which take effect July 16, 2012.

The revision is the first major overhaul of the COPs in over 25 years.

Among other changes, hospitals will have the option of using either stand-alone nursing care plans or single interdisciplinary care plans by nursing and other disciplines. The government also put its stamp of approval on use of standing orders, provided certain conditions are met.

In addition, the COPs make permanent the requirement that all orders, including verbal orders, must be dated, timed, and authenticated.

The government says its intent in revising the COPs is to “reduce outmoded or unnecessarily burdensome rules.”

Medical staff broadened
The final COPs take a more straightforward approach to the medical staff issue than the proposed COPs did.

In the final version, hospitals have flexibility to include other practitioners, such as advanced practice RNs (APRNs) and physician assistants (PAs), as candidates for the medical staff, with privileges to practice in accord with state law. All would function under the medical staff rules.

The medical staff must examine the credentials of all eligible candidates (as defined by the hospital’s governing body) and then make recommendations for privileges.

The Centers for Medicare and Medicaid Services (CMS) says hospitals that choose this option might see “significant savings” because these other practitioners will enable physicians to focus on more complex patients.

Change from proposal
The proposed COPs had said hospitals could grant privileges both to physicians and nonphysicians, even if they were not appointed to the medical staff, though they would have been subject to medical staff requirements.

CMS says the majority of comments to the proposed COPs published in October 2011 supported broadening the medical staff. Physician groups mostly disagreed, while nonphysicians generally expressed support but urged CMS to go further.

A “significant number of comments” adamantly opposed allowing practitioners to have privileges without being members of the medical staff, expressing concern about the lack of medical staff oversight, the agency notes.

The final version essentially says hospitals can broaden the types of practitioners they include on the medical staff and grant them privileges, within state law.

But CMS declined to go further by requiring hospitals to guarantee that nonphysician practitioners be represented on the medical staff and to give them specific rights. It also declined to be more prescriptive about credentialing and privileging.

Here are highlights of other revisions.

Single governing board
One governing board is allowed to oversee multiple hospitals in a system.

Medical staff leadership
Podiatrists can now be leaders of the medical staff.

Self-administered medications
Hospitals may have an optional program for patients and/or their support persons to self-administer appropriate medications. The program must:

• address the safe and accurate administration of specified medications
• ensure a process for medication security
• address training and supervision for self-administration
• document self-administration of medications.

Blood, IV transfusions
The requirement for nonphysicians to have special training in administering blood transfusions and IV medications is eliminated. Those who perform those functions must do so in accord with state law and medical staff policies and procedures.

Drug, biologic orders
Drugs and biologicals may be prepared and given on the orders of practitioners other than physicians in accord with hospital policy and state law. The orders may also be documented and signed by practitioners other than physi-

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Standing orders
The COPs give hospitals flexibility to use standing orders with the requirement that medical staff, nursing, and pharmacy approve written and electronic standing orders, order sets, and protocols. Orders and protocols must be based on nationally recognized and evidence-based guidelines and recommendations.

Verbal orders
The requirement for authentication of verbal orders within 48 hours is eliminated, deferring to state law regarding time frames.

Authentication of orders
The new COPs make permanent the temporary requirement that all orders, including verbal orders, must be dated, timed, and authenticated. This must be done by either the ordering practitioner or another practitioner responsible for the care of the patient and authorized to write orders by hospital policy in accord with state law.

Infection control log
The outmoded requirement to keep an infection control log is eliminated. Hospitals are already required to monitor infections and use a variety of surveillance systems to do so.

Transplant verification process
The new COPs eliminate the requirement for an organ recovery team working for the transplant center to conduct a “blood type and other vital data verification” before recovery when the recipient is known. CMS says this is duplicative because verification is completed at 2 other times in the transplant process.

Critical access hospitals
Among other changes, the revised COPs eliminate the requirement that critical access hospitals must give certain services directly, instead allowing them to provide such services under arrangement. This includes diagnostic and therapeutic services, laboratory, radiology, and emergency procedures.

The COPs clarify that surgical services is an optional service for critical access hospitals, which is already understood.

The revised COPs (CMS-3244-F) were published in the May 16, 2012 Federal Register and are available at www.cms.gov/Regulations-and-Guidance/Legislation/CFCsAndCoPs/Downloads/CMS-3244-F.pdf

Cardiac cath labs
Continued from page 24

Infection rate in cath lab patients is basically zero for percutaneous procedures, but attire is still an issue during accreditation surveys, he says.

“The Joint Commission tells us we should be wearing caps and masks because it’s an operating room type of environment,” says Dr Naidu. “But it’s not really an operating room environment because we don’t have the same ventilation requirements, and we don’t do open procedures.”

The cath lab does follow OR attire protocols for certain procedures, he notes, such as pacemaker implantations and closing of septal defects and patent foramen ovale.

But for the most part, he says, full surgical attire is not necessary for cath lab procedures.

“In the consensus statement, we say, ‘Although their efficacy remains unproven, it is reasonable for hats and masks to be worn for every procedure,’ but we don’t make them mandatory except for specific high-risk procedures.”

Similarly, surgical hand scrubs for every case are deemed reasonable in the statement, though the consensus is that physicians should perform hand scrubs for the first case of the day and use self-drying antiseptic solutions before subsequent cases.

Antibiotic prophylaxis is not indicated for routine catheterization procedures but is routinely given before implantation of devices.

The exception is stents because implantation of stents basically has a zero infection rate, he says.

Interventional cardiology procedures performed in a hybrid OR should follow OR protocols because open procedures are performed in these rooms, whereas only percutaneous procedures are performed in the cath lab, he notes.

—Judith M. Mathias, MA, RN

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With the early issuance of quality reporting codes for Medicare, both ambulatory surgery centers (ASC) and the Centers for Medicare and Medicaid Services (CMS) have a chance to develop expertise in their use and to resolve any technical problems before the mandatory start date of October 1, 2012. And that is what is happening.

For example, some early-adopting ASCs have seen their Medicare claim forms returned because a processor’s system didn’t recognize the new codes.

CMS is investigating. “Let me find out what’s going on,” Anita Bahtia, PhD, told a group of ASC administrators on hearing of the problem. Meanwhile, she assured them, they will be paid if they resubmit the claims but leave out the new codes, called G-codes, for now.

Dr Bahtia, whose specialty is public health, is program leader for quality reporting at CMS. “The point of starting early is to practice,” she reminded the group in a presentation to the Ambulatory Surgery Center Association (ASCA) annual conference in May 2012 in Dallas.

‘They listened’
Outgoing ASCA president David Shapiro, MD, praised Dr Bahtia and CMS for working closely with the industry to craft a coding system that would reflect accurately ASC practices without placing undue administrative hardship on surgery centers.

“They really listened to us,” Dr Shapiro says. “They told us what their issues were, and we told them what ours were.” Among the issues were the need to use limited staff resources effectively and the need for training and access to CMS for information.

The new codes are the product of close collaboration between the industry and CMS regulators. CMS adopted most of the measures and criteria developed by the ASC Quality Collaboration (ASC QC), a consortium of ASCs, professional associations, and accrediting organizations.

The quality measures the codes will reflect are:
- patient burns
- patient falls
- wrong-site surgery
- hospital transfers
- timing of prophylactic antibiotics.

The National Quality Forum, a national standards organization, endorsed the measures before they were submitted to CMS and will continue to review and update them as needed.

CMS issued the new codes on April 1, 2012, and ASCs were invited to start using them immediately. After October 1, 2012, ASCs that fail to use the new codes for at least half of the 5 measures will be penalized in 2014 with a 2% reduction in that year’s payment update. CMS provides additional
ASC-reported data shows a good record on quality

It is unlikely that there will be any surprises after ambulatory surgery centers (ASC) start reporting quality measures. For the initial 5 measures that CMS will start collecting in October 2012, a recent study shows ASCs have a good record, and it’s getting better.

During the 4th quarter of 2011, data provided by 1,309 ASCs indicate their patient-fall rate is 0.126 per 1,000 admissions, down from 0.156 in the 1st quarter of 2011.

Patient burns declined even more sharply for this group, to 0.017 per 1,000 admissions from 0.035 in the 1st quarter.

The ASC Quality Collaboration (ASC QC) issues quarterly reports based on voluntary reporting by participating ASCs. In the current report, every state was represented except Vermont.

For the other measures, results in the 4th quarter compared with the 1st quarter were as follows:

- Hospital transfer: 1:04 per 1,000 admissions, down from 1:194
- Wrong site: 0.045 per 1,000 admissions, up from 0.03
- IV antibiotic timing: 98% on time, up from 97%

A 6th measure, appropriate surgical site hair removal, was included in the survey. ASC QC recommended it, but the Centers for Medicare and Medicaid Services (CMS) did not adopt it. The survey responses showed 99% of participants used appropriate methods, up from 98%.

According to ASC QC executive director Donna Slosburg, RN, the results are made public and may be helpful to patients considering outpatient surgery. “These data and the accompanying information do not present all there is to know about the quality of ASCs,” Slosburg notes. “Patients are encouraged to discuss these quality indicators with their local ASC staff and their physicians.”

Why the focus on quality?

“It’s something you all have been doing forever,” Dr Shapiro told the ASCA administrators, regarding the focus on quality. Documenting that effort is something else: “It costs money, it takes time.”

The recent focus on defining and measuring quality will benefit ASCs in several ways, he says. Pursuing quality “motivates people to excel and increases the likelihood of desired outcomes.”

In addition, it will provide a marketing tool for ASCs by demonstrating with statistics the level of quality their patients enjoy.

“With no mandate [for reporting quality], regulators and Congress had the impression that ASCs did not measure quality,” Dr Shapiro says. “It was not the case; it was just that there was no mandate.”

In any case, he notes, state accreditation requirements are beginning to include quality reporting with increasing frequency. From a business perspective, quality measurement is a management tool that helps in planning, improvement priorities, recruitment, and attracting investors.

“This is the bright side of the CMS mandate,” he says.

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Looking to the future

The first 5 quality measures will be reported on Medicare claim forms starting in October. The codes reported for procedures performed between October 1, 2012, and December 31, 2012, will affect the payment updates for 2014. Dr Bahtia stresses that payments will be based on whether the ASC reports or not—not on whether the ASC complies with the quality criteria.

The 6th quality measure, use of a safe-surgery check list, and 7th measure, the volume of selected procedures, will become reportable July 1, 2013, through August 15, 2013, but those reports will be based on performance this year—from January 1, 2012, to December 31, 2012. Rather than using claim forms, ASCs will enter data on a CMS-assigned website. Failure to report these measures will result in lowered payments in 2015.

The 8th measure, vaccination of staff against influenza, takes effect October 1, 2014, through March 31, 2015. During that period, ASCs must report vaccination rates using the National Health Care Safety Network administered by the Centers for Disease Control and Prevention. Dr Bahtia says she is beginning to develop criteria to be used in adoption of value-based purchasing (otherwise known as “pay for performance”) for ASCs. In March 2012, the Medicare Payment Advisory Commission (MedPAC) recommended that ASCs begin participating by 2016.

—Paula Defohn

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HHS asked for rationale on single-use vial advice

US Representative Cliff Steams (R-Fla) has written to the Department of Health and Human Services asking for the rationale and evidence behind the Centers for Disease Control and Prevention’s infection control guidelines for use of single-use vials, the ASC Association reports.

The guidelines call for medications labeled as “single dose” or “single use” to be used for only one patient. The CDC says these drugs typically lack antimicrobial preservatives and can be contaminated when used inappropriately.

The association says it is working to schedule a meeting with the CDC about the guideline and its effect on ambulatory surgery centers.
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At a Glance

California fines 5 hospitals for retained items
Five hospitals in California were fined for not following policies and procedures that resulted in patients needing surgery to remove a retained foreign item, the state’s health department announced June 1, 2012. Foreign items included sponges, a surgical towel, and an electrocautery tip.

Overall, 13 hospitals were fined a total of $825,000 for noncompliance with licensing requirements resulting in events that caused, or were likely to cause, serious injury or death.

—www.cdph.ca.gov/Pages/NR12-023.aspx

Blood test identifies increased postop mortality risk
Elevated troponin T levels in the first 3 days after noncardiac surgery independently predicted a higher risk of mortality in a new study. Troponin T is a protein marker of heart injury.

Of more than 15,000 patients, those with a peak troponin T value of at least 0.02 ng/mL were significantly more likely to die than those with a value of 0.01 ng/mL or less.

Most patients did not die until an average of 6 or more days after their troponin T was identified as elevated, holding out hope there is time to intervene, the lead investigator said.


Total joint patients burdening critical care
About 1 in 30 patients having elective total joint procedures need critical care services before discharge, increasing the burden on the health care system, finds a study.

Total hip and knee patients who required critical care had higher mortality rates, longer hospital stays, higher costs, and were less likely to be discharged to home.

Hospitals need to allocate resources for this significant part of the patient population, says the lead author.


SSIs linked to past skin infections
In a study, 6.7% of patients with a history of skin infections developed surgical site infections compared with 3.1% of those without such a history.

It made no difference whether the skin infections were recent or occurred years earlier. Adjusting for intraoperative infection risks and adherence to infection control best practices had no impact on risk estimates.

If the results are right and individual biology accounts for some SSI risks, penalties for failing to prevent SSIs “may be at least partially premature,” the lead author says.


Smoking drives up costs for surgical patients
Surgical patients who smoke have significantly higher hospital costs than those who have never smoked and former smokers, finds a study.

Postoperative respiratory complications helped drive up costs, not length of stay, in the analysis from 123 Veterans Affairs Medical Centers.

The findings underscore the need to target smoking cessation proactively, says the lead author.