Analytics: A powerful tool for OR process improvements

Analytics is a buzzword in today’s healthcare world, but behind the buzz is a very real tool. If used appropriately, analytics can help OR managers achieve improvements in stubborn problems such as turnover time. But OR leaders must first understand analytics principles before applying them in their management practice.

Analytics as a tool
“Analytics is a discovery tool that allows you to access data and transform it into knowledge you can act on,” says Andi Dewes, BSN, RN, director of clinical solutions for Surgical Information Systems (SIS), Alpharetta, Georgia.

“It merges many related data points to tell a story about what’s going on in your business,” adds Amy Smith, MSN, RN, NEA-BC, president of Accelerate Healthcare Management, Martinsville, New Jersey. Smith is a former vice president of perioperative services at Robert Wood Johnson (RWJ) University Hospital, New Bruns-
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Perioperative nursing needs a standardized educational path for entry into the profession, according to James X. Stobinski, PhD, RN, CNOR (cover story), yet there’s no single entity for taking charge and making that happen. Stobinski lays out some options for how to achieve the education and competency needed for the OR. Most hospitals, he says, use AORN’s PeriOp 101 course for the didactic piece, but clinical skills are taught in a variety of ways.

Some methods for ensuring clinical skills competency were presented in last year’s Education Special Report (OR Manager, August 2014, pp 7-16). We spoke with leaders at facilities that had partnered with academia, developed skills courses, and revamped their orientation program to boost the ranks of OR nurses.

Along with specialized OR education and skills, we noted, there’s an increasing focus on the Institute of Medicine’s (IOM) recommendation for all nurses to obtain a bachelor’s of science (BSN) in nursing by 2020.

One organization solidly on the BSN bandwagon is the Center to Champion Nursing in America (CCNA), a joint initiative of the Robert Wood Johnson Foundation (RWJF) and AARP. For the past few years, CCNA has been involved in coordinating a national campaign to implement the IOM’s recommendations.

As part of their “Future of Nursing: Campaign for Action,” CCNA has achieved much progress, notably:

- a 69% increase in the number of students enrolled in RN-to-BSN programs between 2010 and 2014
- increases in the number of minority students in baccalaureate, master’s, and doctoral programs between 2010 and 2014
- establishment of four models to streamline academic progression.

The Academic Progression in Nursing (APIN) is another grant initiative established by RWJF to fund nine states that are working to advance nursing education. Leaders involved in APIN’s work and implementation of some of these educational models recently spoke about their progress. In particular, they noted the effectiveness of partnering with community colleges.

According to consultant Mary Sue Gorski, PhD, RN, some colleges and universities are creating programs in which students first earn a BSN and then become an RN. For example, Santa Fe Community College, Santa Fe, New Mexico, and New Mexico State University, Las Cruces, have partnered to offer a dual degree program. Students enrolled in this program get their associate’s degree from the community college and their BSN from the university, after which they are allowed to sit for RN licensure, according to Jenny Landen, MSN, RN, FNP-BC, dean of the School of Health, Math, and Sciences at Santa Fe Community College.

These programs, while not OR-specific, demonstrate the growing momentum behind nursing education. We’ll continue to report on developments in OR nursing education, recruitment, and retention. Meanwhile, OR leaders stand to benefit from the emphasis on nursing education and the increasing ranks of nurses with BSNS.

—Elizabeth Wood

References
www.campaignforaction.org.
Pressure ulcers affect up to 3 million adults in the US each year, according to the Agency for Healthcare Research and Quality. Surgical patients are at high risk to develop pressure ulcers because of immobility during long procedures and anesthesia that blocks sensitivity to pain and pressure.

Estimates of treatment costs range between $37,800 and $70,000 per ulcer, with total annual costs as high as $11 billion.

The Centers for Medicare & Medicaid Services now considers Stage III and IV pressure ulcers a healthcare-associated condition and will not pay more for the treatment of patients who acquire them in the hospital.

These are compelling reasons for perioperative nurses to be proactive in doing risk assessments and using preventive measures to protect their patients. No standard or tool for identifying surgical patients at risk for pressure ulcers is currently in use, but there is one on the horizon.

Cassendra Munro, MSN, RN, CNOR, perioperative educator at Providence St John’s Health Center, Santa Monica, California, created the Munro Pressure Ulcer Risk Assessment Scale for Perioperative Patients (Munro Scale) to identify adult general surgery patients at risk for pressure ulcer development. AORN has partnered with Munro to develop the scale.

An implementation study of the Munro Scale began this spring, Munro told OR Manager. Seven facilities are included in the study, funded by a Cardinal Health E3 Foundation Grant (Dublin, Ohio).

Munro Scale

The Munro Scale emphasizes assessment of patient risk; it is not a skin assessment. The patient’s risk level is scored for each phase of surgery (pre-, intra-, and postoperative), with a cumulative score that is communicated to the inpatient unit for continuation of care. Not only is it a standardized risk assessment, it is also a documentation and communication tool.

The preoperative score is based on factors such as comorbidities, nutritional status, body mass index, and mobility. The intraoperative score encompasses type...
of anesthesia, hypotension, blood loss, and length of procedure.

OR-specific risk factors include:
• use of positioning aids
• moisture on or under the patient
• friction and shear during transfers.

Patients continue to be at risk postoperatively. For example, a patient who was in the supine position for 10 hours during surgery should be turned from side to side if possible in the postanesthesia care unit to relieve the pressure.

Implementation study
Tools for facilities involved in the implementation study include:
• instructions for use, which are available in a printed document and presented via a webinar
• Munro Scale
• end-user feedback gathered electronically via a survey
• two case studies for practice
• references and a literature review
• two frameworks—Diffusion of Innovations Theory for the method of implementation and RE-AIM for evaluating the implementation.

Collaboration with the seven facilities is the key to this project, Munro says. “I could not have embarked on such a project without the collaboration of the facilitators at each site. Their feedback alone has been invaluable,” she says.

Munro believes feedback from the facilitators has greatly improved instructions for use, but she wants end-user feedback, too.

A validity and reliability study also is underway. The results from this study are needed before converting the Munro Scale to an electronic format and making it available for use, she says.

No changes foreseen
The types of changes that have been made to the Munro Scale so far have been made for ease of use and for clarification of instructions for use, Munro says. If any changes were made to the actual risk factors, they would have to be supported by evidence-based knowledge. Munro doesn’t foresee any changes unless the results from the validity and reliability study show more work is needed before the tool is put into clinical practice.

“We know that, like other tools, once you get them into clinical practice, you can gather more data and get more information, and others can begin their own studies,” Munro says. “That’s what I am looking forward to because I am in amazement of how much interest there is in the Munro Scale, and I welcome the collaboration of everyone helping to make it ready for clinical use.”

—Judith M. Mathias, MA, RN

References


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he says he could come up with in his doctoral work was about 180,000. About 45,000 are certified. A new certification for surgical services managers will be coming out in July, which may add to the number (sidebar at right).

State Boards of Nursing know the number of nurses in each state who renew their licenses, but they don’t have good information on how many are in each specialty and how old they are.

The Institute of Medicine’s 2010 report on the Future of Nursing made it clear that there was an incomplete picture of the nursing workforce and that nursing needed to do a better job of collecting data, but 5 years later data are still lacking.

Two options
Because no entity has overall responsibility for workforce planning for perioperative nurses, it comes down to what happens at each hospital or within each health system.

“If you need perioperative nurses, you only have two options,” says Stobinski.

Option 1. Try to hire them, and try to find experienced nurses. The first problem with this option is that everyone is looking for those nurses, and the competition is fierce. The second problem is that the nurses may have experience, but there is no way to know how they were educated or the quality of their programs.

The ideal perioperative nurse, says Stobinski, is one with 8 to 10 years and some scrubbing experience, someone who can do orthopedics and neuro—because that’s where the money is—and someone who is not too near retirement age.

Option 2. Train them in-house.
According to the 2014 OR Manager survey, two-thirds of all facilities will hire new graduates, bring them into the OR, and educate them.

This option is resource intensive and costly, says Stobinski. “You are going to need a clinical nurse specialist, a nurse educator, and a learning lab.”

Stobinski had an in-house education program at St Lukes Health System in Boise, Idaho. The program lasted from 12 to 15 months, they recruited nationwide, and they had 12 to 15 applicants for every slot. “The retention rate was superb,” he says.

The nurses signed a contract for 2 years of service to the hospital that included the 12 to 15 months of training. If they left before the end of the 2-year period, what they had to pay back was prorated from the cost of the course, which was around $10,000. Very seldom did someone leave before 2 years, says Stobinski.

The curriculum most ORs use is

New credentialing exam for OR managers
Surgical services are facing a shortage of OR managers just as they are staff nurses. In most organizations, excellence starts from the top. Having managers validate their specialized knowledge helps them more clearly understand the importance of asking staff to do the same.

Just as with staff nurses, the Competency & Credentialing Institute (CCI) in Denver believes OR managers would benefit from structured training and education to prepare them for their role, then validating their knowledge to show they have the tools for success. This is why they have developed a Certified Surgical Services Manager (CCSM) credentialing program.

To be eligible to apply for the CCSM exam, candidates must:
• Hold an RN license and a bachelor’s degree either in arts or science.
• Be currently employed (either full- or part-time) and have a minimum of 2 to 4 years’ experience in a surgical services management role, depending on CNOR certification status (CNOR is not required to sit for the CCSM exam). Work experience in a nonpaid, volunteer capacity is acceptable.
• Have completed a minimum of 30 to 50 continuing education contact hours or 6 to 12 hours of academic coursework, depending on CNOR certification status, in the 2 years before application. Coursework must be in one or more of the seven subject areas covered on the CSSM exam: strategic management, operational management, financial management, communication & relationship management, human resource management, leadership, and professionalism.
• Have contact hours in any of the seven subject areas or in just one area.

The inaugural CCSM discounted fees for the July 2015 testing period are $225 if CNOR certified and $300 for noncertified.
http://www.cc-institute.org/cssm/
AORN’s PeriOp 101 course, but it is expensive, he notes. Other ORs assign a new person to a preceptor, says Stobinski, which sometimes boils down to the lessons of, “follow what I am doing, and don’t ask too many questions.” In this scenario, the new hire is going to learn what that one person does and maybe a lot of bad habits.

No standardization
What perioperative nursing needs is a standardized educational path for entry into the profession, says Stobinski, “a standard that says you must study this and be able to do this to become a perioperative nurse.” The real basic problem is that no one entity has overall control.

There is no mandate for consistency or quality and no test a perioperative nurse must take to determine competency (sidebar bottom right). “All of us took a test to become an RN,” he says, “but there is nothing like that for perioperative nursing.”

The only standardized test of the knowledge needed to work in the OR is the CNOR exam. Although PeriOp 101 has a final exam, not everyone takes PeriOp 101, and the final exam is based on what a panel of subject matter experts say the knowledge base is—not on a job analysis.

How did we get here?
OR nursing was the first recognized nursing specialty. It happened in the 1880s, and shortly after that a debate began—is OR nursing a technical skill or real nursing?

“Nurses are still arguing about this today, and nursing schools are still having this discussion,” says Stobinski.

OR experience was deemphasized in nursing curriculums with the decline of the diploma program and the rise of the associate degree (AD) program.

From the 1880s to 1940s, the OR was integral to pre-licensure nursing education. Before World War II, more than 90% of nurses went to a diploma school. With the start of World War II, the country was faced with the need to rapidly increase the nursing workforce, and the associate degree program was born. “We stripped away all the stuff that was not considered entirely necessary so we could churn them out and get them to the war front,” he says.

After World War II, the associate degree programs continued to grow, and the diploma schools continued to decline. Economically, it no longer made any sense to go to school for 3 years when they could become RNs after 2 years.

The unfortunate consequence was the absence of the OR as a clinical site as well as instructors who

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**A COMPARISON**

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**MACRO LEVEL PERIOPERATIVE NURSING COMPETENCY**

- Quality of the Perioperative Nursing Workforce
- Learning in the Nursing Work Environment (Experience, In-service Education, Skills Fairs)
- Sub-specialty Education (Periop 101 or similar course)

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Novice to Expert Continuum for perioperative nursing education

There are five stages in the Novice to Expert Continuum for perioperative nurses.

**Novice**

Novices are beginners with no expertise.
- They are taught general rules to help perform tasks, and they will use those rules for everything because that is their basis for how they do things.
- The rules are context free (ie, they have no experience to place with the rules). The rules are independent of specific cases and applied universally.
- Their rule-governed behavior is limited and inflexible. A common comment heard from nurses in the first few weeks is: “Tell me what I need to do and I’ll do it,” but they don’t know what to do and they can’t sort out a clinical picture, says Stobinski.

**Advanced beginner (this stage can last 2 to 3 years)**

- Advanced beginners demonstrate marginally acceptable performance as long as they are kept in cases they know.
- They have prior experience in actual situations and can recognize recurring meaningful components, but they can’t prioritize, and their time management skills are poor.
- They begin to formulate principles based on experiences to guide their actions.
- A mentor or preceptor guides their learning.
- Their practice is rule-based.

**Competent**

“This is the stage you want to get the nurse to,” says Stobinski.
- They typically have 2 to 3 years’ experience in the same area. They know what they are doing. When they make a mistake or run into a problem, they ask for help. The novice doesn’t know what a mistake is.
- They can differentiate between current and future aspects of a situation and prioritize accordingly.
- They gain perspective from planning their own actions based on conscious, abstract, and analytical thinking.
- They are focused on time management.
- They may have an unrealistic concept of their abilities, and they tend to be overconfident, so they still bear watching.

**Proficient (from 3 to 6 years, plus)**

Proficient and above requires somewhere between 3 and 6 years of experience and beyond. “Some nurses never reach the expert stage, which is okay because these proficient nurses are great people to have in your OR,” says Stobinski.
- They see things and understand situations as whole parts. They know the important parts in the big picture. They can identify the most salient aspects of a situation.
- Their more holistic understanding improves decision-making.
- They learn from experiences and apply their learning to different situations. For example, they may not have done a certain case with one surgeon but they did it with another, and they know how to apply their experience to the current case.
- They have confidence in their knowledge and abilities.
- They focus less on rules.
- They are able to manage time effectively.

“If you have a lot of these on your staff, you are golden,” says Stobinski.

**Expert**

Experts don’t rely on rules and principles. They run very much on intuition. They have an intuitive grasp of what’s needed, and they can do any case. “However,” says Stobinski, “they are poor preceptors, so having all experts is not great if you need teachers.”
- Experts have a greater background of experience.
- They possess an intuitive grasp of clinical situations.
- Their performance is fluid, flexible, and highly proficient.
- Meeting patient needs is one of their chief concerns, and they function as patient advocates.
- The focus on self and one’s own performance is diminished.
know anything about the OR. Diploma nurses got at least 3 months in the OR, and some learned to scrub and circulate. A lucky few got an additional 3 months if they took their elective in the OR. Now, most student nurses only spend 1 day in the OR.

“What we have done is take our standardized training we had in diploma schools and given it to the hospitals, and now they have a financial interest, and it is different than having it done in an academic setting,” says Stobinski. (See sidebar top right, p 8.)

**Novice to expert**

One method to train perioperative nurses is to follow the Novice to Expert Continuum. This model, proposed by the Dreyfus brothers, Stuart and Hubert, in 1980 at the University of California, Berkeley, was applied to the nursing profession by one of their students, Patricia Benner, PhD, RN, FAAN, professor emeritus at the University of California, San Francisco.

The model is based on five stages of learning—novice, advanced beginner, competent, proficient, and expert (sidebar, p 9).

The Dreyfus brothers’ model of skill acquisition was first used with fighter pilots. The US Air Force was losing fighter pilots in crashes and hired the Dreyfus brothers to study how pilots learn and acquire skills. Other groups the Dreyfus brothers studied were surgeons, chess grand masters, baseball players, and martial arts experts. The five stages held true for all.

The terms used in the continuum should not be confused with competency, notes Stobinski. Competent is one of the stages, but it is not directly related to a person’s ability to perform a skill. Some nursing educators change the name of the competent stage to skilled practitioner or something else to avoid confusion, he says.

“A lot of people talk about novice to expert, but it is a diffi-
cult thing to implement,” he says. There are some key points to be learned regarding the Novice to Expert Continuum:

• Nurses develop skills and understanding of patient care over time through a sound educational base plus experience in the care environment. A certain amount of classroom education has to happen, but there are limits to what can be learned in the classroom. Perioperative nurses have to do cases.
• All nurses will pass through these stages—no one begins at expert—but a change in work role or environment may cause a nurse to regress on the continuum. “A key point to remember is, we can be an expert in one field like labor & delivery, but when we change work environments, we will regress back to novice,” says Stobinski. It takes 2 to 3 years of experience in the same work area to function at the competent level.
• It is possible to learn the skill (knowing how) without learning the theory (knowing why). For example, says Stobinski, when a preceptor teaches a new nurse a skill without explaining why, and the preceptor doesn’t perform the skill correctly, the new nurse learns the skill incorrectly.
• Experience is a prerequisite for expertise. “Without practical work experience, a nurse will never become an expert. It can’t happen,” he says. Not everyone makes it to expert.
  “When all is said and done,” notes Stobinski, “we Baby Boomers and diploma graduates have a vested interest in how we educate perioperative nurses. We are going to be recipients of healthcare soon, and we want nurses to assist with our knee and hip procedures who are as well educated and trained in the OR as we were.”

—Judith M. Mathias, MA, RN

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Analytics

Continued from page 1

wick, New Jersey, where she used SIS software programs.
That story can be challenging for OR managers to write. “A lot of managers get frustrated because they don’t have good tools for analytics—tools that give them the data points they need,” Smith says.

Dewes adds that managers may not use tools to their full extent because they think they are more rooted in information technology (IT).

However, newer tools are more user-friendly to OR managers. “You no longer have to find someone to write a special report when you want information,” Dewes says. “It’s a new day.”

Most analytics software has built-in capabilities to produce easy-to-read graphs and charts that visually tell the tale. “At a quick glance you know what you’re looking at,” Smith says.

Such tools meet the desire of managers to be able to visualize data; a survey in MIT Sloan Management Review found managers expected that “the ability to visualize data differently will be the most valuable technique in 2 years.” Well-developed analytics tools also make it easy for users to adjust parameters as progress points toward the goal are met.

Analytics software may be integrated into the overall documentation system for the organization. If not, OR managers can work with their IT departments to purchase a third-party add-on.

Smith says the more user-friendly tools help OR managers “own” the analytics and quickly obtain information. “Instead of relying on IT to generate reports, you have the ability to have data in near real time,” she says.

Once the tool is in place, how is it best used? Dewes and Smith say that analytics should be embedded into projects.

Creating a project charter

While at RWJ, Smith used the organization’s structured method for defining a project—problem statement, objective (including goals and metrics), and project scope (sidebar at bottom). “That was our charter for the project,” she says. “It’s a great management tool.”

Project scope is particularly important when navigating the project. “When you head down the path and hit three options, having a defined scope helps you decide which decision is appropriate,” Smith explains.

Project leaders report every 2 weeks on the charter, including what was accomplished, what wasn’t accomplished, and what additional resources might be needed.

Here’s how a project charter and analytics helped the team at RWJ address common problems OR managers face—on-time first case starts, overtime, and OR utilization—as part of an overall goal to improve operational efficiency.

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Keeping focused

Amy Smith, MSN, RN, NEA-BC, president of Accelerate Healthcare Management, Martinsville, New Jersey, says using the format below helps a project team keep focused on the goal, rather than the metrics. “Instead of starting with the metrics and working in reverse to the goal, the idea is to start with the goal, develop objectives, and then decide what factors or drivers are interfering with the ability to meet the goal,” she says. “Then you know what information or metrics need to be captured.”

Example
Culture change

“We didn’t have robust operational practices to support building a culture of accountability,” Smith says, so the first step was to change the culture. The team revamped the daily 9 am huddles already in place so that specific issues were assigned to individuals who reported back the next day on progress.

“It helped people understand that the expectation was follow-through,” Smith says. “It also opened up the lines of communication and created transparency.” Management and clinical staff shared hurdles to solving problems. Metrics also were reviewed weekly during three existing meetings (directors planning, OR staff, and service line), with recurring themes addressed in regularly occurring meetings involving stakeholders on staff.

Late case starts

For late case starts, the problem statement was, “Late cases are running at about 37%, which is over the target of around 20%.” The goal was to return to the target, and the metrics were to measure total on-time starts weekly. The project scope consisted of:

- Basic process information—reasons for case delays. Cases are considered late if the start time is 15 minutes or later than the scheduled start time.
- Key milestones—80% compliance with late-case documentation
- Constraints—number and type of add-on cases. All add-on cases were assigned an arbitrary time to be scheduled, which increased the number of late cases.

Smith chose two analytics tools to measure progress: a slide tool (see image above) and a gauge chart (see image above). “The slide tool allowed me to change late criteria as we made progress,” she says. “Once we hit our 15-minute initial definition of ‘late,’ I moved it to 10 minutes.”

The gauge chart, similar in look to a gas gauge, displayed the percentage of on-time case starts. This quick visual made it easy for surgeons and staff to see progress. “Red meant you’re in trouble, yellow meant you were making headway, and green meant you were doing a good job,” Smith says.

Although not all analytics software programs have these exact visuals, OR managers can use similar ones or even create their own visuals in their analytics or software programs.

Collecting reasons for delays proved challenging because staff nurses believed the initial codes didn’t capture all the reasons for delays. Smith and her leadership team worked with staff nurses to identify nearly 60 codes that were then added to the system. For example, reasons for anesthesia delays were categorized as:

- anesthesia delay—intraop
• anesthesia delay—postop
• anesthesia delay—preop
• anesthesia delay—unavailable
• anesthesia delay—holding
• patient risk—intubation
• patient risk—IV access
• patient risk—reintubation.
Other categories included delays related to scheduling, preoperative area, surgeon, turnover, transport, equipment, housekeeping, personnel, and central sterile processing.

Despite the additional categories, staff nurses often still failed to document the reason for the delay. To correct the problem, missing documentation reports that showed the name of the circulator who failed to enter a reason were discussed in the daily huddle so individuals could be held accountable, Smith says.

As a result, documentation subsequently improved from 32% to 80%, which helped her to identify anesthesia delays as a significant issue. After that issue was addressed, on-time case starts improved from 75% to 85% over 8 months.

Overtime and room utilization

The problem statement for overtime was, “Overtime is currently averaging between 6% to 7% a month, resulting in higher than expected labor costs.” The goal was to reduce overtime to an average of 5%, and the metrics were to measure overtime by pay period and report a quarterly percentage. This was the project scope:
• In scope—review of case volume and staffing plan to determine where staffing does not meet case demand, resulting in the use of on-call/overtime
• Basic process information—staff needs have been matched to meet caseload demands

Metrics can support culture change.

• Constraints—unpredictability of surgical volume (add-on and emergency) and staff scheduling changes protected by current union contract.

Smith says a challenge with this problem was trying to convert extensive—and not user-friendly—financial data into a format she could use to make decisions. SIS staff helped her create a dashboard to organize the data.

“It gave me productive hours by pay period and by job codes, and productive versus unproductive time,” Smith says. “I could even break it down to the level of job title.”

The data showed that although RN overtime was 40% of hours worked, clinical care technicians (CCTs), or OR assistants, accounted for nearly half (47%) of the overtime. Although the lower pay scale for CCTs meant RN overtime costs were still higher, it was something Smith needed to investigate.

She found that a monthly average of 25% to 30% of hours worked by CCTs was overtime and that this group had a high rate of leave of absences. Smith was able to hire two per-diem positions to remove this built-in overtime.

The task of tackling RN overtime took Smith down the road of investigating room utilization because, as she says, “My staffing plan has to mirror my case volume.”

She analyzed room use by hour of day, focusing particularly on 3 pm to 5 pm because of excessive on-call usage. Her analysis showed she needed 34 RNs during that time frame, but only 28 were normally scheduled.

Smith had been turning to on-call staff, who had to be paid a minimum of 4 hours, to fill the gap. “We looked into when staff

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Performance improvement

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were coming in and how we could better accommodate volume later in the day,” she says.

Because several rooms were still in use at 3 pm, she created new shifts of 9 am to 5 pm and 9 am to 7 pm.

Although initially Smith was concerned about whether staff would be willing to work those hours, she found they suited staff who wanted to be home to see their children off to school in the morning. She also rearranged staff schedules to provide more coverage during peak times and hired a few new staff members.

Smith also revised OR block and scheduling policies, which increased utilization by 7%. Improvement in staffing and efficiency meant that most add-cases didn’t have to be scheduled for the end of the day, when resources were lower.

“It built capacity in the OR so we could accommodate an increase in volume of 247 cases over 1 year, and we added an additional $3.5 million to the bottom line,” Smith says (sidebar, p 15).

Overtime decreased by $500,000 even as case volume increased.

Avoiding pitfalls

“Just because you have analytics doesn’t mean you’re going to be able to change your OR,” Smith says. Senior leadership support is essential.

“There needs to be an organizational commitment to using data to run your business,” she says. That commitment helped her have difficult conversations with surgeons, such as the need to change block time based on current utilization.

“The relationship between the two [OR manager and surgeon] is very important, too,” Smith says. “The data has to be perfect. Surgeons are scientists, so they will analyze and scrutinize where the data is coming from and how it’s calculated, particularly if the data doesn’t say what they want it to say.” OR managers need to ensure accuracy before meeting with the surgeon.

Failure to share data and project goals with staff is another possible pitfall to successfully applying analytics.

“Most staff want their environment to improve and their hospital to thrive,” Smith says. “You have to spend a lot of time communicating to staff, including sharing analytics reports and engaging staff.”

Sustaining change

Smith says her experience at RWJ showed her that good analytics tools are easy to learn, easy to use, and easy for merging data from other sources. “I got the data I wanted in a usable format. That allowed me to make the business decisions I needed to make for my OR, and we were able to make real sustainable changes,” she says.

“OR management is hard work, but discipline and execution—combined with today’s analytics tools—can get you the data you need,” Dewes notes. ✫

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Reference

Better communication and teamwork improve sterile processing efficiency

Relations between the OR and the sterile processing department (SPD) are not always smooth. OR staff need timely, accurate instrument trays that meet the highest standards of safety. Anything short of 100% performance leads to complaints about the SPD.

But many OR staff members do not appreciate the challenges faced by sterile processing. In most hospitals, the SPD handles a huge volume of surgical instruments on a daily basis. Staff receive little support in terms of training and other resources, and managers must contend with high turnover.

How can surgical services leaders improve sterile processing efficiency, productivity, and accuracy? Recently, team members from Surgical Directions discussed the problems that lead to poor SPD performance. Surgical Directions is a Chicago-based perioperative consulting firm that includes experienced sterile processing leaders. According to these experts, most SPDs have reasonably effective processes and workflows. The real opportunities to improve performance are in better communication, education, leadership, and teamwork.

**Engage OR staff**
In many hospitals, OR staff are quick to express dissatisfaction with the SPD. However, at least some sterile processing problems originate in the OR.

“What often happens is that nurses will open up five or six trays for a case, but they will not put every instrument back in the tray it came from,” says Patricia May, BSN, RN, CNOR, senior nurse specialist at Surgical Directions. “After those trays go through washing and disinfection, SPD staff find instruments that don’t belong in a tray or trays that don’t have all the instruments they need.”

Extra instruments are set aside. Meanwhile, incomplete trays go back to the OR. “This reinforces a self-perpetuating problem,” May says. “When an incomplete tray goes up to the OR, nurses start opening peel packs to find the instruments they need. That creates twice as much work for the SPD.”

This process also increases materials costs as the SPD eventually accumulates a large inventory of unmatched instruments.

The solution is to make sure OR nurses and surgical technologists (STs) recognize that they have a role in sterile processing workflows. According to AORN, preparation for decontamination is to begin at the point of use.

**Educate SPD team**
“In many hospitals, the educational piece is completely lacking,” says John Wheeler, MBA, BSN, RN, consultant at Surgical Directions. “There is no set program for training SPD staff and no dedicated educator.”

New hires generally learn the job from existing staff. They pick up department processes, but do not gain an understanding of the purpose of various instrument sets or how they are used.

“With the complicated instrumentation of today’s technology, SPD staff really need to understand the theory behind what they are doing,” Wheeler says. He and May recommend three strategies for building the sterile processing team’s knowledge base:

- **Expose SPD staff to the OR.** Let SPD team members observe surgical cases and see how instruments are actually used. This exercise can help SPD staff understand the importance of tray accuracy. It can also underscore the importance of instrument inspection (for instance, why a nicked rongeur will cause problems during neurosurgery).
- **Bring OR staff to the SPD.** Ask OR service line experts to provide in-service instruction to SPD staff. These sessions can provide the sterile processing team with more in-depth explanations of various procedures and instrument sets. They also give SPD staff the chance to ask specific questions about points they do not understand.
- **Invest in SPD certification.** Wheeler encourages hospitals to support professional certification for SPD staff. Allocating budget for staff certification

Continued on page 18
Cross-train and plan for peak times.

Invest in materials
Inadequate instrument inventories create some inefficiencies. Consider what happens when SPD staff identify a damaged or malfunctioning instrument. If the repair budget is not available, the instrument may simply be removed from use. Alternatively, the instrument will be sent out for repair, but there may not be a replacement on hand to complete the set. Both scenarios increase the likelihood that the SPD will ship an inaccurate instrument tray.

The solution is financial. The hospital must allocate dollars to ensure timely instrument repair and an adequate replacement stock.

Holding extra inventory in sterile processing can also speed workflows. For example, say a tray is being assembled and a hemostat is missing. If an extra supply of common instruments is at hand, the staff member can complete the tray with minimal disruption.

As an overall solution, make sure the SPD performs regular manual inventory counts. This requires a resource commitment, but it can save costs by reducing the stock of unmatched instruments.

Fine-tune staffing
The typical sterile processing department is very productive. In fact, visitors are often surprised by the volume of surgical instruments that are processed by an SPD in a 24-hour period. However, SPD workflows are often uneven, which creates labor cost inefficiencies. According to the experts, two strategies can help optimize SPD staffing:

- Cross-train staff. “In some departments, staff members are assigned to either decontamination or sterilization, and that one function is all they do,” May says. As a result, while staff on one side of the process are struggling to work through a backlog, team members on the other side are nearly idle. May recommends cross-training SPD staff for different jobs within the department. This allows managers to shift staff to match the workload. It also helps the team move material through the system faster and more accurately.

- Staff for peak load. In many SPDs, the majority of employees work the day shift. Staff members arrive at 9 or 10 am, but department workload is not really in full swing until 1 or 2 pm. The department is essentially overstaffed in the morning and understaffed from mid-afternoon forward.

“SPDs need to correlate staffing patterns with workload,” Wheeler says. One hospital he visited solved the problem by conducting a department bidding process.

“First, management identified the number of FTEs needed for each shift. Then, everyone was allowed to bid for the shift they wanted, based on seniority.”

Align leadership
Most sterile processing departments are isolated from the rest of the hospital, both physically and organizationally. This separation is at the root of many communication problems. However, SPD isolation can be mitigated through strong department leadership.

One solution is to make sure the sterile processing department reports to the OR director. “In many hospitals, the SPD reports to materials management or a VP who doesn’t understand sterile processing,” May says. Aligning sterile processing under surgical services can strengthen teamwork between the two areas. It can also help ensure SPD staff get the resources and support they need.

Strong leadership is critical to getting the SPD on executive radar. “A lot of hospital executives have no idea what goes on in sterile processing,” Wheeler says. “The department needs a very strong leader who can relate to executives and help them realize what the SPD brings to the table every day.” Communication points include the department’s key role in patient safety and quality, its daily work volumes, and its resource needs.

Join forces
OR and SPD staff can improve teamwork by collaborating on challenges. One opportunity is joining forces to tackle the issue of immediate-use steam sterilization (IUSS).

“Every OR and SPD should be working together to assess the need for IUSS and put systems in place.”
Don’t let faulty processing put a damper on instrument packaging

Instruments that are still damp or wet after being sterilized cannot be placed in storage. The moisture that remains on or inside of a package can create a pathway for microorganisms to travel from the outside to the inside of the package. Moisture may be in the form of visible dampness, droplets, or puddles of water on or within a pack, and any instruments stored in a damp condition are vulnerable to rust. Any time a wet pack occurs, the instruments are contaminated and need to be reprocessed prior to use.

Some studies have shown that up to 85% of wet packs are the result of human error or clinical practice, so sterile processing staff must be aware and take care to avoid them. Because of the many variables in steam sterilization, it is important to document each occurrence of wet packs and to involve all of the key participants—central sterile personnel, infection preventionists, and staff from surgical services, facilities management, and clinical engineering—in resolving the issues.

Causes of wet packs
During sterilization, as steam hits metal it is immediately cooled when heat transfers to the metal. As this occurs, the steam condenses and forms droplets on the metal. Using lint-free absorbent material helps to absorb the moisture and facilitate drying. If, however, the pack is too dense, the excessive amount of metal may result in the condensation of too much moisture, and a wet pack will occur.

Package preparation
Improper preparation of instrumentation or textile packs can trap water. If instrument sets are consistently wet, they should be reviewed to find out if:

- the instrument set is too heavy or dense
- basin sets lack absorbent material to wick moisture in between basins
- textile packs are too dense
- the packages are wrapped too densely or too tightly
- instrumentation is packaged while still wet
- plastic peel pouches are placed inside of a wrapped or containerized instrument set
- multiple-part instruments requiring disassembly are not disassembled
- instruments are placed on concave surfaces that do not allow for drainage
- the sterilization container is prepared incorrectly, eg, using the wrong filters
- trays or instrumentation are not designed to allow proper drainage and drying
- nonabsorbent tray liners are used
- the manufacturer’s packaging instructions for use (IFU) are not being followed
- packaging materials are not held at 68°F to 73°F (20°C to 23°C) for 2 hours before use.

Sterilizer loading practices
Instrument sets and other packages may be prepared properly but loaded into the sterilizer improperly. The sterilizer operator can cause wet packs if the sterilizer is not loaded properly. Sterilizers should be loaded so that the load configurations provide adequate air removal, steam penetration into each package, and steam evacuation.

Instruments that can hold water, such as solid-bottomed pans, basins, and trays, should be positioned so that they are oriented in the same direction, allowing water condensate or any water to drain easily. Plastic peel pouches should be placed on their sides.

Incorrect sterilizer operation or faulty sterilizer loading and unloading practices can cause wet packs. Specifically, clinical errors include:

- using a dry time less than the medical device manufacturer’s written IFU
- loading that does not allow adequate air elimination and drainage of condensate
- using sterilizer cart liners that are made from nonabsorbent material
- loading solid-bottomed pans, basins, or trays so that they do not drain adequately
- not placing peel pouches on their sides
- having too cool a temperature in the cooling area
- placing textile packs incorrectly (ie, not on their edges)
- unloading warm packages unto a cool surface.

Sterilizer components
A malfunctioning sterilizer can cause wet packs. A steam sterilizer consists of many components.
Its operation depends on the steam generation and distribution system with which it is used, the electrical system, and other mechanical systems unique to the facility. The sterilizer effectiveness can only be verified in the environment in which it will be used. Wet packs can occur from sterilizer or utility reasons such as:

- the boiler is not properly maintained
- steam lines are improperly insulated
- the boiler feedwater contains too many noncondensable gases (such as air)
- steam dryness is not between 97% and 100% (i.e., there is too much water in the steam)
- water treatment affects the level of noncondensable gases
- changed (e.g., seasonal), unusual, or increased demands are placed on the steam system
- the trap in the steam line malfunctions or is missing
- insulation of steam lines is improper or insufficient
- steam pipework does not allow condensate to flow properly
- the drain check valve malfunctions or is missing
- pressure gauges and controllers are out of calibration
- steam lines are blocked or partially blocked
- condensate accumulates when the sterilizer is not in operation
- the drain screen clogs
- the gasket is not intact.

Storage
The manner in which sterile packages are stored can cause them to have moisture, such as when:

- humidity in the storage area is above 70%
- transportation vehicles are damp or wet
- packages are located in areas where high humidity is normal
- packages are transported from air-conditioned environments to non-air-conditioned environments.

Investigation
When performing an investigation, analyze the occurrences of wet packs to see if there is a pattern such as the time of day, shift, sterilizer, time of the year, position in the sterilizer, specific instrument set, packaging, association with a specific employee, high humidity, or any other contributing factors. Document the day, time, technical staff, items, packaging, and sterilizer loading and unloading. Evaluate the drying process by means of controlled, random sampling and opening of selected sets at the completion of the drying/cooling time. Once the cause of wet packs is known, the process can be corrected.

Preventive action
Wet packs should not be released. They should be opened for inspection and then repackaged to ensure the wet pack will not recur with new packaging material. Disposable products such as gauze and cotton balls should be discarded. Chemical indicators should be replaced with new ones, and textiles should be removed and replaced with freshly laundered textiles that have not been ironed.

These images show a container above a wrapped set of instruments (top left), which is a poor loading practice; a wet pack where hot instrument sets have been placed on a cool case cart (bottom left); an instrument set improperly loaded onto a sterilizer cart (placed flat), resulting in a wet pack (top right); and an instrument set that has been wrapped too tightly (bottom right). Photos courtesy of Susan Klacik, BS, CRST, CIS, ACE, FCS. Used with permission.
Packaging
Instrument sets should be prepared in a manner that will ensure adequate steam contact with all surfaces to reduce the potential for wet packs. There are a variety of packaging methods to use when preparing instrumentation, and the preparation and assembly of surgical instrumentation is a complex process. To prevent wet packs, instrument sets should be sterilized in perforated or wire-mesh-bottom trays or in containment devices such as specially designed loaner sets or a rigid sterilization container.

Nonlinting absorbent material may be placed in the tray to facilitate drying. Moisture will dry more readily from absorbent materials than from droplets or pools on solid metal surfaces.

The materials and construction of the packaging used in pack preparation have an impact on the sterilization process. These factors should be evaluated for ease of air removal, steam penetration, and steam evacuation.

Instrumentation should be open and evenly distributed throughout the tray. Instruments with multiple parts should be disassembled for proper steam contact to avoid trapping steam that can condense, resulting in a wet pack. Moisture found inside of a package is typically caused by pack preparation, eg, metal items may be positioned in a way that allows water to pool so as to trap steam that later turns into water.

Temperature and humidity equilibration of packaging material is needed to permit adequate steam penetration and to avoid superheating. Temperature affects relative humidity, so a preconditioning temperature range is also recommended. The current AAMI Standards recommend relative humidity should be controlled between 30% and 60% in all sterile processing areas except the sterile storage area, where the relative humidity should not exceed 70%. The general area temperature should be controlled between 68°F and 73°F. The temperature in sterile storage may be as high as 75°F.

Basins and trays
Assembly of basin sets can have an effect on the drying process, resulting in wet packs. Basin sets should be assembled so as to permit air removal, steam penetration, and steam removal during the sterilization and drying process. Basins should be nested within one another. Their size should differ in diameter by at least one inch. Basin sets should be prepared so that all basins are placed in the same direction for moisture to drain with nonlinting absorbent material between them to facilitate drying.

Some instrument sets, such as instrument trays made of plastic and containing plastic, require longer drying cycles. Manufacturers’ IFU for these types of instrument sets should state whether the drying cycle should be lengthened.

Even when all of the preparation and sterilization processes are followed correctly, the environment used to prepare the sterile packages can cause wet packs—as can the environment surrounding the sterilizer and sterile storage area.

A large majority of wet packs are caused by the factors discussed above. The sterilizer and the utilities also play a large role in the sterilization process. Sterilizers should be installed, maintained, inspected, and cleaned according to the manufacturer’s written IFU. A qualified individual to inspect, maintain, and repair the sterilizer should carry out maintenance. Worn and damaged parts such as recording devices (as applicable), filters, steam traps, drain pipes, valves, and door gaskets should be replaced.

Additional information can be obtained from the 2013 edition of the AAMI ST79 Comprehensive guide to steam sterilization and sterility assurance in health care facilities, which has a new annex on wet pack assessment and methods to resolve wet packs. This new annex is title Annex P Moisture assessment.

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References
OR staff reap rewards of paperless patient tracking system

Clearing a patient for surgery is no easy feat, and a completely paper-based workflow can be very inefficient. Switching to a paperless tracking system has cut labor and costs in the preanesthesia screening services (PASS) department at Sinai Hospital, LifeBridge Health, Baltimore, and nurse leaders there hope to integrate the system into other units.

“What the hospital was doing was just labor intensive, not cost-effective,” says Cheryl Haglauer, RN, clinical leader of the PASS department at Sinai, which handles about 100 procedures each day. “We had to physically write out a piece of paper, stand at the fax machine to send it to a doctor’s office, and document everything we had done on multiple pieces of paper multiple times.”

Nurses had to access and input patient information into three separate locations, so 40% of their time was being spent on clerical work. In addition, the 9% cancellation rate at Sinai translated into approximately 2,340 canceled procedures and $7 million in lost or deferred revenue each year.

In 2013, Sinai partnered with Optimum Health, Inc, a health information technology company based in Annapolis, Maryland, to transfer to OPTIM$ER, a customized, paperless tracking system that interfaces with Sinai’s electronic medical record system and provides up-to-the-minute status reports on patient readiness.

After 1 year, Sinai was able to:
• reduce cancellations that equated to a $2.1 million revenue opportunity
• improve full-time employee productivity by 1.7 FTEs and avoid costs of $200,000
• add 14 PASS patients per day at a net revenue of $350,000
• save $8,000 in paper and other supplies
• improve PASS nurse and manager satisfaction by 78% as determined by an employee survey.

Process improvements

Sinai’s transition to a new electronic tracking system began with months of coordination between the PASS nurses and staff at Optimum Health.

To create a customized system, the nurses were shadowed and surveyed for 6 months.

“We feel it’s important that if you’re going to help assist in a workflow, you capture the workflow appropriately,” says Vicki Harrison, president and cofounder of Optimum Health. “You don’t just automate a workflow for the sake of automating it because if the workflow’s already broken, you’re not going to have any benefits.”

After the customization process was complete, the system went live at Sinai in September 2013, and the workflow improvements were immediate. PASS nurses are now able to look at a customized dashboard that shows each step required to clear a patient for surgery. Green checks identify completed tasks, red x’s identify incomplete tasks, and a P represents provisional clearance, meaning that an outstanding task needs to be completed. Nurses can then drill down into the notes to find the provisional reason.

Multiple users can view the dashboards at the same time, which reduces both time and confusion, especially because Sinai’s PASS department occupies two different floors of the hospital.

“To be able to have that concurrent view—to leave notes about a patient for someone who is working on the same chart and for everyone to have access to that information at the same time—has been amazing,” says Sakinah Abdullah, MSN, RN, manager of patient care services in the PASS department, preoperative area, and postanesthesia care unit (PACU) at Sinai. “We are more thorough because we can see better what we have from our patients and what we don’t.”

An electronic faxing component automates up to one-third of the critical process steps and eliminates the back and forth between physicians’ offices and the PASS nurses.

“It gives us a seamless electronic process to track everything that’s been done for or around a patient,” says Haglauer.

The system has also extended to other areas beyond the PASS department. The posting process at Sinai now updates nurses and staff every 15 minutes of any changes, which is a vast improvement, according to Haglauer.

“Before, when it was only updated a couple times a day, and it entailed me running a physical piece of paper schedule, I may have worked that schedule all day long thinking I still needed preoperative tests when in fact it was taken off of the schedule hours ago,” she explains.

On the other hand, if a patient is added to the schedule in the morning, Haglauer sees that immediately on her dashboard and knows to start taking all the necessary steps to have him or her
cleared for surgery.

The dashboards are also used in the daily 2:30 pm huddle with all perioperative staff members. Before staff began using OPTIMI$ER, they huddled for up to 1 hour to go over the following day’s case schedule. Huddle time has since been reduced by 60%.

The system is also used on the day of surgery. Staff see a specific dashboard driven by the PASS department that alerts them about any steps that haven’t yet been taken, such as a pregnancy test or a blood glucose examination.

“They can see on a schedule of 60 cases there may be five cases where there are things they need to look at with a patient,” says Abdullah. “It allows them to look at all the charts the night before to see where the obstacles might be.” Previously, nurses spent a few hours on the checks and balances necessary to clear a patient on the day of surgery. Now they’re able to complete that in an hour the night before.

**Increased efficiency**

All of these process improvements have increased productivity and decreased waste of time and money. For Haglauer, the greatest value of the change in workflow has been the added transparency.

“Before, when everything was on paper, we kept a lot of our notes to validate what we were doing if there was any question down the road of why a patient did or didn’t have preoperative tests,” Haglauer says.

They had to document contact with the patient and with the surgeon’s office on handwritten pieces of paper. Digging through those to put together a timeline that would validate the sequence of events was cumbersome. “Now, anyone with access to OPTIMI$ER can go in and see a sequence of events in real time with a date time stamp in the system,” she says.

With less clerical work for nurses, staff satisfaction has increased, and staff can be redeployed to offer additional preoperative visit appointments. This increased productivity is the greatest value for Abdullah. “I have more productivity with my nurses,” she says. “I may have had four nurses working on a particular schedule. I’m down to three or less now to manage this process.”

This has allowed Sinai to add an average of two surgical cases per day that otherwise would have been cancelled because of delays or staff shortages.

PASS nurses now have more time for patient education and communication. “Because they’re not spending so much time in a paper chase and trying to log onto this system and that system and chase down a manila file folder to check the status of a patient, they now have more time to call patients before the day of surgery, so patient education is better,” notes Heather Guild, chief marketing officer of Optimum Health.

More patient education on the front end leads to better compliance, she adds. PASS nurses also have more time to communicate with patients and with physicians’ offices to ensure continuity of care. “This gives us more time to make sure we have everything we need to ensure that patients have a safe and positive surgical experience,” says Haglauer.

**Future plans**

Sinai staff members are now in their second year of OPTIMI$ER implementation, and plans to extend the system’s use are being explored. One hope is to involve patients in the use of the system, perhaps through a portal allowing them to fill in their own histories and participate in their own education and preparation for surgery, Abdullah says.

“Sometimes, no matter how many times you tell people, they forget,” says Haglauer. “There’s too much going on, and they can’t process it.” An online educational portal would help to reinforce pre- and postoperative instructions to patients.

Abdullah also hopes to integrate OPTIMI$ER into the PACU in order to ensure patients’ information is current before they are discharged. The system could also help them generate postoperative phone calls to their patients, she adds. Taking the information at hand and carrying it through the entire patient experience is her end goal.

A patient portal would also give patients the opportunity to evaluate their surgical experiences. Abdullah hopes to be able to incorporate patient satisfaction queries into the system to assess whether their expectations have been met. “If we could close that loop with the whole experience, it would be really impactful,” she says.

For Haglauer, the process improvements have been substantial. “After doing it on paper and by hand for so long, I finally got what I’ve been wanting for a very long time.”

— Mai Hanoon

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**Technology**

"Efficiency has increased case volume."

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UV light disinfection robots help to overpower pathogens

Disinfection robots are first on the ECRI Institute’s 2015 Top 10 Hospital C-Suite Watch List, which includes new and emerging technologies healthcare providers should know about. Hospital-acquired infections (HAIs) are a persistent problem, and a recent study supports the efficacy of disinfection robots. However, the technology is expensive, and experts caution that robots should not be considered a replacement for other infection control strategies.

"People are looking for an extra sense of protection," says James Davis, MSN, RN, CCN, CIC, HEM, senior infection prevention analyst at the ECRI Institute in Plymouth Meeting, Pennsylvania. The ECRI Institute’s list includes hydrogen peroxide vapor (HPV) robots in addition to ultraviolet-C (UV-C) robots.

One reason for including disinfection robots on the list has been the rise of Ebola, Davis says. "In the last quarter of 2014 with the Ebola outbreak, we saw a two-fold increase in purchasing of these types of machines," he says. "Hospitals are looking at these machines to do terminal cleaning because with something like Ebola, where risk is high and the public is acutely aware, the robots give an extra sense of security that you got all the nooks and crannies.”

Reducing infections
Multi-drug-resistant organisms such as Clostridium difficile (C diff), methicillin-resistant Staphylococcus aureus (MRSA), and vancomycin-resistant Enterococci (VRE) are other pathogens that are difficult to eradicate in hospital settings. According to a recent study in Infection Control & Hospital Epidemiology, robots using UV-C light exposure reduce these pathogens.

The pulsed-xenon UV disinfection robot (Xenex, San Antonio, Texas) contains a non-mercury xenon gas flash bulb and emits a broad spectrum of radiation that penetrates pathogens’ cell walls and renders them unable to reproduce. In addition to the flash bulb, the portable unit has a UV feedback sensor, a control panel, and a door sensor (photo).

Researchers who tested the device found that, when used for 10 minutes, it reduced recovery of C diff, MRSA, and VRE on frequently touched surfaces in hospital rooms.

One section of the study showed the pulsed-xenon system significantly reduced the presence of pathogens where there was no manual cleaning, indicating that the reduction was solely due to the UV disinfection.

Cleaning more thoroughly
Adding this level of cleanliness to terminal cleaning was the goal when the Texas Health Southwest surgery department in Fort Worth purchased a pulsed-xenon system 3 years ago.

“We were looking to get our MRSA and drug-resistant organism rates down,” says infection preventionist Katherine Rhodes, BSN, RN, CIC, COHN-S, CHSP. They used the system as an adjunct to their terminal cleaning and periodically after cases with higher contamination levels, such as a C diff case or after draining a wound.

“We started seeing some pretty significant decreases of surgical site infections,” she says. "Since we bought the system, our MRSA rates decreased by 50% in 2013 and then another 50% last year.”

Texas Health Southwest received a national award for surgical site infection decreases, and, according to Rhodes, the disinfection robot was a factor in their success. “We did quite a few other initiatives on practice and AORN guidelines, so it’s difficult to say if there was one driver, but I think it did contribute,” she says. The facility has since purchased another pulsed-xenon system and has put a dedicated staff member in charge of the robot on the patient floors.

Rhodes says the system’s 10-minute cycle time is critical. “It’s a pulsed-UV light, so it works much faster than the other UV devices,” she says. “We’ve got a tremendous patient growth volume, so we were really looking for what we could implement that wouldn’t affect our throughput.” The pulsed-xenon system is also easy to move and has no exposed bulbs or tubes, unlike some other UV disinfection systems, she adds.

Though Davis recognizes the value of disinfection robots, he stresses that they should be used as an added layer to complement infection control protocols already in place. “UV light and hydrogen peroxide vapor don’t actually penetrate bioburden. We want people to look at and evaluate this technology as an adjunct to cleaning,” he says.
Rhodes also views the pulsed-xenon system as an extra step to their cleaning routine. “I think sometimes when you read the literature from various UV device manufacturers, you almost get the impression that it’s going to save you time because you’re using it instead of manual cleaning,” she says. “I certainly would not recommend that.”

Making purchasing decisions
Hospital leaders must consider several angles when deciding whether or not to buy a disinfection robot. “Make sure you’re purchasing the type of equipment that has the right level of support that you need and the staff to support it,” says Davis.

The pulsed-xenon UV disinfection system costs around $80,000, and—according to Davis—there are not many unbiased publications that currently prove their worth. “As it becomes more popular, we’re hoping to see more double-blind, controlled studies between technologies,” he says. “We know it’s scientifically effective, but how effective is it in an environment outside of the manufacturer’s literature?”

One such study is being planned by the ECRI Institute later in 2015, according to Laurie Menyo, director of public relations and marketing communications. Their independent medical device testing unit plans to conduct a device evaluation between different UV disinfection units to help hospitals make the best procurement decisions based on cost, effectiveness, and usability, she says.

The type of environment in which the device will be used is another important factor to consider, Davis says. The HPV devices tend to cost around $30,000 less than UV devices, but their room turnaround time tends to be longer. Additionally, hospital leaders should think about which types of equipment are in the ORs they plan to use the robots in and how effectively each robot would disinfect that environment.

“You need to do a lot of evaluation and due diligence to make a decision that is not only right for your pocketbook, but right for the environment you’re using it in,” says Davis.

For Rhodes, the opportunity to reach the buttons and crevices of complex OR machines such as their anesthesia machines is a benefit worthy of the added cost, time, and labor. “You’re disinfecting areas that you probably, even in a good manual cleaning, are really not getting to,” she says. “It eliminates the human error.”

But anyone considering whether to add the disinfection robot should evaluate the facility’s entire manual cleaning process, Davis notes. “They need to evaluate all the technologies out there, whether it be UV light, HPV, or even looking at their regular cleaning,” he says.

Keep in mind the probable expectations of adding a disinfection robot to cleaning routines, Davis advises. “This technology by itself likely will not make your infection rates magically go down. The literature to support those claims just doesn’t exist presently,” he says. “It will just help your regular cleaning process and give yourself, and maybe your patients, an added level of security.”

References
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Patients come first. That is the brief, yet insightful, first principle for the ambulatory surgery industry: Give patients a safe, cost-effective, convenient, and attractive place to have their elective surgery, and profits and career satisfaction will follow.

Well, perhaps, but it is all too easy to become involved in regulations, financial strategy, and technology—elevating the quality of care but leaving out the person who should be the center of the healthcare team: the patient.

As ambulatory surgery centers (ASCs) take on more complex procedures and treat patients with more serious conditions, reaffirming that first principle becomes critical for outcomes and patient satisfaction.

Recalling Hippocrates

In 1978, a San Francisco woman, Angelica Thieriot, was so frustrated by the treatment she had received during a hospital stay that she founded an organization to promote patient-centered care. Now called Planetree Inc after the tree Hippocrates sat under while teaching medicine, the group is based in Derby, Connecticut, and has members in the US and four other countries.

Planetree offers training and consulting services, and awards Planetree Designation to hospitals and other facilities meeting its standards for patient-centered programs.

Any healthcare organization may apply for the designation, but so far only one ASC has done so: Laser Spine Institute in Tampa, Florida. Nicole Gritton, MSN, MBA, RN, LHRM, vice president of nursing and ASC operations, has developed a program that follows the Planetree standards.

“It’s the way you approach the patient,” she explains. “We focus on the entire patient, as opposed to a diagnosis.”

Despite high satisfaction rates overall, LSI wanted to achieve more, Gritton says.

The first step in developing the program was talking to patients, not only about their conditions, but also about their expectations regarding treatment. “Patients want results that work—they want to get back to life,” Gritton says. When surgeons asked, patients indicated they wanted:

- the least-invasive option available
- great communication
- to be valued and at the center of clinicians’ attention.

Chief operating officer Alan Manning says some Planetree hospitals have affiliated surgery centers, but LSI is the first stand-alone ASC to apply. “The Laser Spine Institute in Philadelphia has been a true pioneer in leading that effort,” Manning says. “We have been impressed by the degree to which LSI has implemented the Planetree model across their enterprise of surgery centers.”

The patient-centered team

LSI performs a variety of less-invasive spine procedures for neck and back pain caused by spinal stenosis, degenerative disc disease, pinched nerves, bone spurs, bulging or herniated discs, sciat-
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“Patients come to us after an average of 7 to 9 years of pain,” Gritton says.

Citing Centers for Disease Control and Prevention data, she estimates that nationally, 100 million adults suffer from back pain, but 60% of those referred for surgery do not have it. That is where the new technology practiced in ASCs can help. “Patients don’t want open back surgery,” she says.

LSI attracts prospective patients through television commercials, the Internet, surgeon referrals, and personal recommendations. To be accepted for surgery, each candidate is first screened medically, beginning with a history form.

Of the initial candidates, about 30% are accepted and 70% are referred for additional screening, such as MRIs and x-rays, because of health conditions. Of the 70% given follow-up screening, 30% are deemed not eligible for outpatient spine surgery—that is, about 20% of total candidates are not able to be treated in the ASC.

Patient screening determines whether a candidate has spine pathology that can be corrected by an outpatient procedure. If not, the patient is referred to a hospital.

Thus, the first consideration is the condition, and the second is the procedure that will be necessary, and whether it is available in an ASC.

The next step is to determine if the patient is eligible. For spine procedures, patient selection is key, Gritton says.

If the screening so far indicates the patient will be appropriate for the procedure, one step remains: explaining the options to the patient. Some will not want to undergo outpatient spine surgery. In addition to the usual considerations of weight, age, comorbidities, and available home care, spine patients need to understand, accept, and comply with pre- and postoperative instructions and communicate their concerns and questions. It is important to have their agreement before proceeding, Gritton notes.

Another component of patient selection for surgery is the financial arrangement. Medicare has recently approved payment for more complex spine procedures. LSI, however, does not accept Medicare patients. Candidates must therefore have adequate private insurance or be able to pay the full amount.

Since 2005, LSI surgeons have performed spine surgery on about 50,000 patients. Gritton says demand has increased steadily while outcomes have been excellent and complications few.

**The Planetree approach**

“What patients want is not rocket science, which is really unfortunate because if it were rocket science, we would be doing it,” Planetree member Laura Gilpin explains on the website. “It is the simple things that we tend to overlook,” she says.

The Institute of Medicine defines patient-centered care as a marker of quality healthcare, and the Joint Commission recognizes the Planetree designation as a quality check in its accreditation surveys.

Planetree, following the Institute of Medicine, calls the concept “health literacy.” It means the ability of a patient and the patient’s family to make appropriate health decisions. This ability requires information and understanding of health issues. Without it, patient-centered care is impossible. Therefore, a first step is communicating with patients in ways that they can understand and encouraging their participation in decisions. “Addressing health literacy challenges must be a healthcare priority,” Planetree tells its members.

In addition, regulations creating accountable care organizations (ACOs) and meaningful use thresholds for electronic medical records (EMRs) require participation of patients in their own healthcare.

**Managing the patient experience**

Jason Jones is vice president of patient experience at LSI. He supervises the full-time patient experience managers (PEMs) at each facility. The PEM is the first person the patient meets, so that, instead of a parade of staff and clinical
place to reduce its use,” Wheeler says. One approach is to establish a joint OR/SPD committee to monitor IUSS.

“The first step is to get data, so that you can talk about what you know is happening rather than what you think is happening.” Once instrument sets that were processed with IUSS are identified, the committee can work together to determine how many were really necessary. “They can also ask, ‘Are we doing the same sets over and over?’ The answer could provide the justification for purchasing additional instruments.”

Personal links
Collaboration solves operational issues and improves communication between the OR and the SPD.

“Bringing people together helps personalize the issues,” Wheeler says. “It starts to put a little feeling between people. It lets people get to know each other and walk a bit in each other’s shoes.” Building stronger personal links between staff members will help the entire surgical services group work as single, coordinated team.

This column is written by the perioperative services experts at Surgical Directions (www.surgicaldirections.com) to offer advice on how to grow revenue, control costs, and increase department profitability.

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specialists, the patient is able to depend on consistent communication with someone who can relate to him or her as an individual.

As a PEM, Jones says, “my role is to create a great experience, and let them know it is safe to raise their hands if they feel we don’t put their needs first.”

Patients respond to this unusual message in a variety of ways, he says. “Some just nod, while others open up right away.”

PEMs and ASC staff receive training in patient communication. Very often, Jones notes, a physician or nurse will explain something and then ask, “Any questions?” The usual response is, “no.”

To elicit a better response, he has clinicians say something like, “I’ve gone over a lot of information. I don’t want you to leave this room with any questions unanswered.” That approach lets the patient know that questions are welcome and expected.

Jones compares the healthcare setting with a restaurant visit. “The reason we don’t like to send food back at a restaurant is fear that it will affect the level of service.” It may take a while and some effort to persuade a patient that complaints or repeated questions won’t affect the caregivers’ attitudes. “If you make sure to earn their trust, you’ll be amazed at how much they’ll share with you,” Jones says.

Not that such sharing is always comfortable.

The PEM role is similar to a concierge’s, caring for the patient’s individual needs. When a problem arises, the PEM has the authority and duty to stop the process and meet with clinicians.

For many healthcare professionals, especially those with long experience in traditional methods, such an on-the-spot conference is uncomfortable.

Despite training and organizational culture and even individual willingness, there will be situations in which defenses will go up, Jones cautions.

“ASCs need to know that there will be resistance,” he says. “Sometimes the staff will go back to what they’re comfortable saying. Not everyone can change.”

A wider view
For complex procedures like spine surgery, patient focus and communication are necessary, but not sufficient for the best outcomes. Surgeons, anesthesiologists, and staff must be well trained and experienced in the outpatient setting. Fortunately, Gritton says, outpatient surgery centers find it easy to attract the best nurses and other staff because of the attractive work environment.

Also important is having a hospital available for transfers and capable of handling spine complications.

Finally, because outpatient back surgery is so new and gaining the attention of the general public, it has attracted media scrutiny, which can help or hinder acceptance of newer techniques, depending on how physicians and ASCs respond to questions and explain the facts. Clear, understandable communication from surgeons and facility managers will promote health literacy and confidence, and ultimately the best outcomes.

—Paula DeJohn
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Effect of hypothermia during colectomy on SSIs
Colectomy patients who sustained a period of intraoperative hypothermia were no more likely to develop surgical site infections than those who were normothermic, a study finds.
In this study of nearly 300 patients, researchers found no statistically significant difference in temperature measurements between patients who developed SSIs and those who did not.
Logistic regression analysis also found no association between intraoperative hypothermia and 30-day SSI rates.
The primary outcome measure was 30-day SSI. Secondary outcome measures included clinical leak, return to the operating room, and nasogastric tube placement.

Duration of blood storage not linked to adverse events
The duration of red blood cell storage was not associated with significant differences in cardiac surgical patients’ Multiple Organ Dysfunction Scores from preoperative through day 7 or the time of death or discharge, a study finds.
Patients having complex cardiac surgery who were likely to need transfusion of red cells were randomly assigned to receive leukocyte-reduced red cells stored for 10 days or less (shorter-term storage group) or for 21 days or more (longer-term storage group) for all intraoperative and postoperative transfusions.
The 7-day mortality was 2.8% in the shorter-term storage group and 2.0% in the longer-term storage group (P=0.43); 28-day mortality was 4.4% and 5.3%, respectively (P=0.57).

List identifies high-risk surgical procedures for older adults
Researchers have identified a list of 227 high-risk procedures in patients 65 years and older. Their study found that older patients have more than 650,000 of these procedures annually.
The pooled inpatient mortality for patients 65 years and older having these high-risk procedures was double the pooled inpatient mortality for younger patients having these procedures (6% vs 3%).
This list of high-risk procedures can be used to standardize the definition of high-risk surgery in older adults in quality and outcomes-based studies and to design targeted clinical interventions, the authors say.