Balancing cost, quality, safety, and efficiency has grown increasingly important in light of the new rules and requirements imposed by the Affordable Care Act. As a result, it’s not surprising that healthcare facility leaders nationwide are seeking ways to streamline their workflow, optimize case scheduling, and eliminate waste of resources.

The core idea of the Lean philosophy is to maximize customer value while minimizing waste, and as healthcare delivery shifts to a value-based system, Lean tools are becoming an essential part of the perioperative environment.

Patients expect and deserve the highest quality care. To ensure that’s being delivered, healthcare leaders must evaluate their systems and embrace change as needed.

Lean thinking changes the focus from optimizing separate technologies, assets, and vertical departments to optimizing the flow of products and services through entire value streams that flow horizontally across technologies, assets, and departments. Process improvements are achieved through the use of rapid process improvement workshops, Kaizen events, and value stream mapping—to name a few of the common Lean techniques.

Numerous Lean-related articles have appeared in OR Manager since June 2013, when we last published a special report on this topic (“Lean Management in the OR”). In this updated report, you’ll learn how improvements have been achieved in communication, patient handoffs, first case on-time starts, inventory management and supply storage, and sterile processing—among many other topics.

We hope these articles will give you an in-depth understanding of what can be achieved through Lean strategies and perhaps inspire you to strive for improvements at your facility.
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Rooms with a view: Kaizen events put things in their proper place

What can you do when you need to store about 9,000 sq ft of equipment in just 7,000 sq ft of storage space? What if your OR supplies are housed in such cluttered, disorganized drawers that staff have difficulty finding things?

Unleash the Lean teams, of course.

At the University of North Carolina Hospitals (UNCH), Lean Six Sigma has become part of the culture. The state-owned, not-for-profit system, which includes seven facilities, began Lean training in 2010. Since then, more than 1,000 staff members have been trained, including more than 110 perioperative services staff qualified in basic Six Sigma and more than 24 staff and managers with advanced-level training.

“My favorite part of using Lean concepts is that [the process] pushes it back to the staff to come up with solutions,” says Elizabeth Finch, MSN, RN, RNFA, CNOR, director of UNCH’s OR and central processing department. “It encompasses everyone—not just nursing, but everyone who touches the equipment, from surgeons to OR assistants to central processing. It’s not coming from the top down, but flows from the bottom up.”

Thus far, UNCH has conducted four Lean Kaizen events related to OR supplies. “Kaizen” is a Japanese term meaning “change for the better.” A Kaizen event is a team-based approach in which quality improvement steps are conducted rapidly, typically over a week or weekend.

The first two Kaizens at UNC were specialty-specific, focused on the cardiac and vascular surgical suites. The more recent two, conducted 5 months apart in 2013, provide larger examples of how Lean tools can be used successfully to overcome challenges related to physical space.

“Don’t assume it’s as easy as cleaning out your closet. You have to make sure everyone is vested in the process. The process plan for what was to be done with their room. Each small team presented a summary of the plan, which went on to indicate what the various pieces of equipment were. And some things were being stored together that shouldn’t have been, such as anesthesia equipment in the OR equipment space and positioning equipment in a utility room.

“We decided we needed to carve out locations for equipment storage in their areas of use and visually manage what was located in each storage area,” Chadwick recalls.

A team of about 22 staff members was established with representatives from each OR specialty group. They met for about an hour every Wednesday morning for 10 weeks prior to the actual event.

During the first few sessions, Chadwick reviewed some basic Lean concepts that would guide the team’s efforts. These included the eight forms of “Muda,” or waste: Defects, Overproduction, Waiting, Non-utilized talent, Transportation, Inventory, Motion, and Extra processing (“DOWNTIME”).

Also key were the DMAIC (Define, Measure, Analyze, Improve, and Control) paradigm and the “5 S” needs assessment: Sort (eliminate the unnecessary), Shine (clean the open spaces), Set in order (bring in the new items), Standardize (ensure that everyone is on the same page; use visual management), and Sustain (establish accountability to keep up the changes, measured before and after).

“DMAIC and the 5 S’s are part of the planning process. They give you a shared mental model,” Finch explains.

The group planned to split the overall equipment storage among six different rooms, sticking to uniform steps for each. “Standardization is probably one of the biggest things that you look at when you’re doing a Kaizen,” Chadwick says. “You want to figure out how to make things flow better. Both process and performance standardization are critical.”

Smaller teams of four to six people took charge of each intended new storage room. They designated each new storage room by color—purple, orange, red, grey, blue, and green. The walls of each room were to be painted those colors, and corresponding colored duct tape was placed on all of the equipment belonging to that room. The storage locations were also marked on the floor to indicate where the various pieces of equipment would go.

The teams mapped out the new storage areas and used to-scale paper cutouts representing the equipment, arranging and rearranging the items until they found the best way to make everything fit. Much time was also spent on standardizing the color-coded signage for each room—like maps in a shopping mall—to guide people to the new locations for the equipment.

The Kaizen event was scheduled over a weekend because the OR couldn’t be shut down during the week. The team met with the sponsors on Friday at noon for their pre-project “tollgate.” A representative from each small team presented a summary of the plan for what was to be done with their room.

Finch, along with Shawn Brooks, the anesthesia manager, and...
Jeremy Cartner, the x-ray technician supervisor, then signed off on the plans. Chadwick’s job had been to serve as intermediary throughout, so there were no surprises. Then the work began. The teams emptied out all six rooms, placing the items temporarily into three ORs and parts of the hallways that weren’t being used over the weekend. Environmental services staff then came in and cleaned the rooms overnight.

Along with environmental services, staff from information technology, engineering, and facilities were vital to the overall success of the project. Improvements made to the space included the platforms installed in two of the equipment rooms, which increased storage space by more than 80 sq ft.

On Saturday, the teams began putting things back into the rooms according to plan, along with the new signs (see images). Team members documented the process in three newsletters that were distributed hospital-wide.

To the team’s delight, the hospital’s chief executive officer, chief operating officer, and vice president stopped by on Saturday afternoon. “Upper management really supports us when we do these things. To have the CEO come by on a Saturday to congratulate the team is a really big deal,” Chadwick says.

By Sunday night, the equipment was housed in its new locations. OR and anesthesia staff satisfaction were surveyed 1 week prior to the Kaizen and 2 to 3 weeks afterward. Based on a 5-point scale, average satisfaction scores before and after the event were 2.76 and 4.08, respectively.

**Streamlining supplies**

The Kaizen for UNCH’s main OR supply room, nicknamed “KMART” for its wide array of items, took place in October 2013. “The KMART was completely overstocked, and it was very difficult to find anything. Supplies were all over the place,” says Finch.

Items were housed in poorly labeled metal drawers. Staff in search of specific items would routinely damage sterile packaging. Overstocking the drawers to available space instead of established par levels required frequent reviews of expiration dates.

*These before and after images illustrate the use of different colored rooms and duct tape to organize equipment storage*

*Source: University of North Carolina Hospitals, Chapel Hill*
Planning for this Kaizen involved the same Lean tools and principles as the equipment storage one, and it also necessitated a couple of extra Wednesday morning meetings (12 weeks total) as well as 8 weeks of Friday afternoon meetings to reevaluate par levels for all the supplies.

“The KMART Kaizen was more difficult, even though it was for just one room. I think that was the hardest Kaizen we’ve done to date just because there was so much stuff in there and so much prework was needed. The individual team members really stepped up and worked hard after hours on every aspect of the project,” Chadwick says.

Once the new pars were established, the team reviewed supply codes for each item to see if the right number was stocked. Unneeded items were consolidated and returned to central distribution or the business office. In all, par levels decreased by 2,148 items, and overstocked supplies were returned to central distribution for a $9,800 credit.

Just as with the equipment Kaizen, the KMART team broke out into smaller groups to address various aspects of the room. Again, they used paper cutouts to model where the supplies would be placed in order to maximize space and efficiency.

“We had such limited space that we were trying to cram as much as possible into, we needed to-scale models,” Chadwick explains. “We spent hours and hours on the smallest details and regulatory requirements. For example, would the new layout provide the required aisle width based on state codes?”

The planned annual budget included approximately 11,000 to purchase new wire bins to replace the metal drawers. That made items more visible and easy to move. Color-coded labeling for the bins clearly identified the type of supply, along with the bar code, par level, and item name. The phone number to call when the bin is empty was prominently posted.

In another major change, the team decided to organize items by supply type rather than by surgical specialty group. The supply storage Kaizen event also began on a Friday afternoon. Team members cleared out the entire room, and after it was cleaned and painted, the new bins were placed and items returned according to plan (see images).

“It was really neat to watch the evolution of the room that weekend. Once everything came out, we realized how big the space actually was,” Finch says.

To help orient staff during the following week, the team gave out maps, conducted tours, and stationed people in the room to give directions.

As with the equipment Kaizen, staff satisfaction with the supply storage area also improved. What’s more, the amount of time required for a staff member to find a given item in the room—which was tested before and after the event—decreased. The time needed by experienced staff picking supplies for an exploratory laparotomy was reduced from 6 minutes, 47 seconds to 4 minutes, 53 seconds. For new staff picking supplies for that same type of case, the time was cut in half: from 12 minutes, 48 seconds to 6 minutes, 26 seconds.

**Lessons learned**

The improvement process continues for both Kaizens, Finch notes. “It’s constantly evolving. Once you do the Kaizen weekend and you live in that space for a while, you see what is working and what isn’t, and you give people an opportunity to tweak it.”

Her advice to those interested in accomplishing what UNCH did is to “go in with no concept. Build the framework, decide what are your absolute no’s. But then let the staff have fun.” Chadwick adds, “The planning is essential. You also have to figure out in advance how to train people on the standard stuff. When you say ‘5 S,’ everyone has to understand what you’re saying.”

Finally, she says, “Don’t be afraid to fail. Nothing is written in stone.”

*Miriam E. Tucker is a medical journalist in Bethesda, Maryland.*

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Boomer business: Lean strategy turns total joints into thriving enterprise

More than 7 million Americans are living with a prosthetic knee or hip, and there is a growing incidence of adults younger than 65 undergoing these procedures, researchers reported at the 2014 annual meeting of the American Academy of Orthopaedic Surgeons in March. Among those over 50 years of age, 5% have replaced a knee, and more than 2% have replaced a hip.

“The aging Baby Boomers are making total joints a very lucrative service line,” notes Lori Wittner, BSN, RN, CNOR, team coordinator for orthopedics and podiatry at Lehigh Valley Health Network (LVHN), Allentown, Pennsylvania. “They are elective procedures with minimal complications.”

As the effectiveness of anesthesia, pain management, and rehabilitation continues to improve, many total joint procedures are being performed on an outpatient or short-stay basis.

In an effort to make its inpatient ORs equally as efficient as the ambulatory surgery settings in the Lehigh area for total joints, LVHN incorporated principles of Lean and Six Sigma to develop a standardized model of care that allows patients to be discharged the second postoperative day. LVHN’s System for Partners in Performance Improvement coaches used Rapid Improvement Events and other continuous improvement initiatives to help streamline and improve processes.

LVHN is a 988-bed Magnet designated hospital with 23 ORs.

Process improvements

Process improvement for total joints at LVHN began a year ago with a series of interdepartmental team meetings.

The vice president of orthopedics brought in consultants affiliated with an orthopedic vendor. After analyzing the orthopedic service line and all associated processes, they offered advice for improvement.

In addition, a group of nurses, surgeons, anesthesia personnel, administrators, physical and occupational therapists, and staff from food service and transport gathered at a resort to brainstorm about standardized processes.

The interdepartmental teams worked together to develop a standardized process for total joints that included:

• preoperative education
• streamlined admissions and preoperative care
• spinal anesthesia for single knee and hip replacements and epidural anesthesia for bilateral knees
• peripheral nerve blocks for postoperative pain management for single knee replacement patients.

To shorten setup and turnover times, surgeons were given a second “flip room” for their cases, and Wittner worked with vendors, surgeons, and sterile processing to cut the number of instrument trays from 5 or 6 per case to 2 or 3.

Vendors now go to a surgeon’s office and overlay implant templates on the patient’s x-rays to determine implant size. “They might template a femoral stem to be a size 6, and in their pan of instrumentation they will put the template size plus 1 size up and 1 size down,” says Wittner. “Those are all we need.”

Streamlined preoperative process

Patients scheduled for single or bilateral total knee arthroplasties are admitted directly to the surgical staging area-procedure (SSAP) unit.

They are admitted to this unit rather than the surgical staging area (SSA) because they will be undergoing a “procedure” before going to the OR, Wittner explains.

For a single knee arthroplasty, the anesthesiologist inserts a catheter into the area of the femoral peripheral nerve. The catheter is hooked up to a pain medication pump postoperatively.

For bilateral knees, the anesthesiologist inserts an epidural catheter, which is used for anesthesia during the procedure and pain management postoperatively.

Single knee and hip patients have spinal anesthesia, which is inserted in the OR.

Total hip patients are admitted to the SSA because they do not have a femoral or epidural catheter inserted.

In the past, all total joint patients were admitted to the SSA, and those needing a femoral or epidural catheter would then have to be moved to the SSAP. “It is much more efficient now,” says Wittner.

The surgeon arrives in the staging areas before the first case of the day and marks the operative extremity or extremities of the first and second patients on the schedule. The surgeon also completes the surgeon’s portion of the “Ticket to the OR,” the hospital’s preoperative checklist.

The preoperative staging area nurse makes sure the chart is complete, signs off on the preoperative portion of the checklist, and clicks “Ready for OR” on the patient tracking system. The circulating nurse’s OR computer screen then displays a message indicating that the patient is ready for the OR.

Flipping rooms improves turnover, efficiency

Total joint surgeons typically schedule 6 or 7 cases per day and are given a second flip room with a second surgical team that includes a surgical technologist (ST), RN circulator, and a certified registered nurse anesthetist (CRNA).

There are also 3 assistants hired by the surgeon who go between the 2 rooms—these include at least 1 physician assistant (PA) and 2 others who are either PAs, RN first assistants, or STs.

For the first case of the day, the room 1 circulating nurse and CRNA go to the SSAP or SSA to interview the patient and then take the patient to the OR.

When they are in the OR, the CRNA pages the anesthesiologist, who will insert the spinal anesthesia if it is a single knee or total
Earlier catheter removal has helped to shorten length of stay of evidence-based research, we were unable to find literature that removed to discontinue the Foley,” says Gross. “Through the use from previously waiting 6 hours after the epidural catheter was removed the epidural catheter is removed. “This is a change in practice after the epidural catheter is removed. “This is a change in practice if the patient has a Foley catheter, it is taken out immediately after the epidural catheter is removed. “This is a change in practice because the patient can start voiding earlier. “Patients have had no trouble voiding since we have started doing this,” she says. Another practice that was changed was not confining patients with epidural catheters to their beds until the catheters were removed. “We now get our epidural patients out of bed and into bedside chairs,” says Gross. “This has been a positive experience for our patients.” Patients have physical therapy once on postoperative day 0 and twice a day on postoperative days 1 and 2. On postoperative day 2, physical therapists determine whether the patients should be discharged to home or to a rehabilitation facility. “Nearly all patients are discharged home,” notes Gross. Medicare regulations require Medicare patients to remain in the hospital until postoperative day 3.

**Postoperative patient benefits**

A key benefit is that because patients are not given general anesthesia, they return quickly to the total joint wing (7K) and resume mobility soon after surgery. “They typically are not groggy or nauseated and vomiting, so they can leave the PACU in an hour or less, and they can get out of bed faster and get moving with their physical therapy on the day of surgery [postoperative day 0],” says Wittner. 

The total joint wing, which opened 8 months ago, has 30 beds and a gym for physical therapy.

When the patients with the femoral catheters arrive on 7K, the catheter is connected to a continuous peripheral nerve block system that infuses ropivacaine, a local anesthetic, at 6 mL per hour near the peripheral nerve.

The ropivacaine is given until midnight of the first postoperative day, when it is stopped by a member of the nursing staff. An anesthesiologist has to remove the catheter.

“We had some issues with the ropivacaine dosing when we first started with it,” says Susan Gross, BSN, RN, the nursing director of 7K. “One dose was too high and another was too low, but now we have found the right dose.”

The problem with too high a dose is that ropivacaine is associated with quadriceps weakness. “If we are getting them out of bed post oper 0, having them walk, and giving them an exercise sheet to follow, we don’t want to increase the chance of them falling,” says Gross.

Bilateral total knee patients arrive on 7K with their epidural catheters still in place. Epidural catheters are removed the morning of postoperative day 1 by an anesthesiologist.

If the patient has a Foley catheter, it is taken out immediately after the epidural catheter is removed. “This is a change in practice because the patient can start voiding earlier. “Patients have had no trouble voiding since we have started doing this,” she says. Another practice that was changed was not confining patients with epidural catheters to their beds until the catheters were removed. “We now get our epidural patients out of bed and into bedside chairs,” says Gross. “This has been a positive experience for our patients.”

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**Total joint class**

Gross sees most of the total joint patients not only postoperatively but also preoperatively in a total joint class she teaches for LVHN. The 1.5-hour class is offered twice a month.

Gross explains fall prevention, safety concerns, and what to expect from admission through discharge. Physical therapists and case managers answer any questions patients may have about physical therapy, postdischarge care, and insurance issues.

Patients receive pamphlets about the class at the surgeons’ offices when they schedule their procedures, and they sign up for whichever class best fits their schedule.

“Though some hospitals make this class mandatory, we don’t,” Gross says, “because of the large volume of patients we see each month.”

**A win for all**

“Applying Lean principles and streamlining processes and instrumentation have increased surgeon and staff satisfaction and made our inpatient ORs equally as efficient as ambulatory surgery centers,” says Wittner. “Our patient satisfaction surveys are in the high 90s, and our HCAHPS [Hospital Consumer Assessment of Healthcare Providers and Systems] scores are very high,” she adds. “It’s a win for all.”

—Judith M. Mathias, MA, RN

**References**


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Most perioperative leaders are concerned about turnover time. And rightly so—lengthy turnovers squander expensive OR minutes. The typical surgery department, however, gives less attention to case time. Many OR directors view case time as a lower priority that is largely out of their control.

This is a mistake. Prolonged case times could be wasting up to 10% of available OR minutes, and long cases create schedule inefficiencies that prevent optimal utilization.

Case time problems are not unsolvable. Leading ORs have developed several perioperative process changes that address the root causes of extended case duration without interfering with surgeons’ operative technique. These organizations have established effective ways to work with physicians on case time reduction.

**Data drives change**

To tackle the problem of lengthy case times, OR leaders must first establish that there is both a problem and an opportunity to improve. The only way to do this is to obtain reliable data.

Step 1 is to establish appropriate definitions. Case time is defined as “wheels in to wheels out,” not “cut to close.” The distinction is important because many of the factors that contribute to long case times originate in perioperative processes outside of the actual surgery.

Step 2 is to develop mechanisms for accurately tracking perioperative events. Make sure circulators are well trained in documentation processes and understand the importance of accurate time-stamping. In addition, create an effective clinical measurement strategy. The secret to identifying specific throughput problems is to break down case times into 6 key intervals:
- patient in to anesthesia ready
- anesthesia ready to prep end
- prep end to incision start
- incision start to incision close
- incision close to OR discharge ready
- OR discharge ready to patient out.

Step 3 includes monitoring and analyzing case time data. Begin by conducting a baseline study to determine current average case times per interval. Once you have baseline numbers in hand, slice the data by surgeon and by procedure.

Within each procedure type, identify surgeons with consistently shorter case times. What do the most time-efficient surgeons do that is different from their peers? In addition, examine better-performing anesthesiologists and nursing teams. What practice patterns lead to faster setup and patient preparation?

Asking these questions—and developing solid answers—requires a multidisciplinary approach. A task force consisting of surgeons, anesthesiologists, nurses, and other clinical specialists should work together to identify specific process problems and solutions to improve patient throughput.

**Improving efficiency**

The case time reduction task force should begin by identifying opportunities to simplify pre-incision and postclosure processes. Many ORs are able to reduce average case times significantly by implementing a handful of process changes:

**Move anesthesia prep outside the operating room.** In many departments, anesthesiologists start all IVs, arterial lines, and pain blocks in the OR. This practice extends case time unnecessarily. Instead, work with the anesthesia department to perform these procedures in the preoperative holding area or a dedicated procedure room.

Some hospitals have created a dedicated block room and secured additional anesthesia coverage to help speed perioperative flow. In addition, consider empowering nurses to start IVs before transporting the patient to the OR.

**Convert sequential steps into parallel processes.** In many surgery departments, the OR must be completely set up before the patient arrives. However, some setup tasks can be performed during patient prep and induction. For example, scrub personnel do not have to finish setting up the back table before the patient enters the room as long as necessary supplies and equipment are in place.

Similarly, breakdown does not need to wait until the patient is out of the room. Nursing staff can begin cleaning up and taking carts out of the room during closure, keeping 1 table and 1 instrument tray sterile just in case a need arises.

**Simplify supply setup.** ORs can reduce supply expenses by analyzing and rationalizing surgeon preference cards. This effort can also simplify and speed preoperative setup. Weeding out rarely used items reduces the number of supplies that need to be prepped. Greater supply standardization helps nurses become more familiar with items in use. It also helps staff create standard approaches to specific procedures.

**Use PAs for complex cases.** Certain specialties—notably, neurosurgery, orthopedic surgery, and cardiovascular surgery—require more complicated setup and call for a higher level of support. For these specialties, hiring specialized physician assistants (PAs) can cut case times significantly. PAs are particularly important for procedures with significant technology setup.

**Require surgeon presence.** In many ORs, the attending surgeon is usually not in the OR during setup and patient positioning. In our experience, the pace of work is typically slower whenever a surgeon is absent. Once the surgeon does arrive, he or she often requests changes to positioning, draping, and/or equipment setup, adding further time to the case.

In addition, many surgeons leave the room before closure. Work slows down once more and, depending on the skill of the resident or other staff, the case can be extended significantly.
Requiring surgeons to be in the OR upon patient arrival ensures that work proceeds at an appropriate pace. In addition, when surgeons are required to stay in the room through most of the closure, the surgery takes less time and the attending surgeon can provide appropriate monitoring of the resident’s closing technique.

Pave the way for discharge. Patients are sometimes held in an OR because bay space is not available in the postanesthesia care unit (PACU). Often, the PACU is backed up because a room is not available in the inpatient surgical unit.

OR directors need to work with other nursing managers to resolve these problems. Fixing postoperative bottlenecks is the key to reducing OR discharge intervals.

Don’t forget about on-time starts. When the first case of the day starts late, it creates inefficiencies that reverberate through the remainder of the schedule. Creating preoperative processes that ensure on-time starts (at least 95%) will help optimize perioperative flow and allow care teams to perform cases as efficiently as possible.

Working with surgeons

Once you have started fixing perioperative problems and unit bottlenecks, you can begin to address surgeon-controlled processes that drive long case times.

Surgeon factors can lead to significant variance in average case times for the same procedure. For example, we recently worked with a hospital where umbilical hernia repair ranged from 30 minutes to 3 hours, depending on who held the scalpel.

The starting point for any surgeon initiative should be data transparency. Develop case time dashboards and share them with the surgical staff. Dashboards should include the surgeon’s personal case time averages along with department comparisons for like procedures.

Surgeons respond to data-driven decision-making, so this tack will engage them intellectually in case time reduction. Dashboards will also promote healthy competition among surgeons to improve case time performance.

Involve department chairs in your case time reduction initiative. Data will undoubtedly identify some surgeons with very long case duration averages. Department chairs should work with these outlier surgeons individually to address the specialty-specific issues and practice patterns that are leading to extended cases.

Highlighting best practices can help encourage surgical staff to become more efficient. Recruit surgeon champions to address case time issues during department meetings. Some hospitals have created transition to practice rooms (TPRs) for senior residents with top-quartile case time performance. TPRs reward efficient physicians while showcasing best practices for the entire staff.

The most successful case time reduction initiatives are driven by peer accountability. This approach underscores the importance of a physician governance body for an OR—a Surgical Services Executive Committee (SSEC). A surgeon-led SSEC is in a strong position to commission a case time reduction plan, endorse recommended changes, and hold peers accountable for performance improvement.

Strong benefits

From the hospital viewpoint, reductions in nonproductive OR utilization support stronger financial outcomes. In terms of performance metrics, lower average case times automatical-
ly translate into higher primetime utilization rates. When OR utilization is managed properly, the result can be higher case volumes leading to higher revenue and profitability, with quality and safety maintained or even enhanced.

For example, say a 12-room OR averages 800 cases per room per year, for a total annual volume of 9,600 cases. Department leaders successfully reduce average case time by 10%, which allows them to accommodate additional volume. A realistic 6% volume increase translates into 576 extra cases per year. Given an average contribution margin of $6,500 per procedure, the volume growth enabled by case time reduction produces a $3.7 million increase in net profit.

While many surgeons will view a case time reduction initiative as a challenge, a successful effort can increase their satisfaction. Efficiency improvements will enable many surgeons to complete more cases within their allotted block, thus producing higher practice revenue.

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 departmental profitability.

This article originally appeared in OR Manager, May 2014;30:25-27.
Restructuring and revamping workflow help a small hospital make big strides

Working for a small facility after spending many years at a large one can present a host of leadership challenges, but meeting those challenges with process changes and improved efficiencies can be highly satisfying.

After serving more than 23 years at the Cedar Crest campus of Lehigh Valley Health Network in Allentown, Pennsylvania, Jodi Koch, BSN, RN, moved to Lehigh’s Muhlenberg campus in Bethlehem as director of perioperative services in December 2012. Muhlenberg has 8 ORs staffed by about 35 FTEs vs the 23 ORs at the Cedar Crest campus, where Koch most recently was director of perianesthesia services. “It was a huge culture change even though we’re in the same organization,” she says. “Our Cedar Crest campus is very large, and our Muhlenberg campus has the feel of a small community hospital.”

Challenges and changes

One of the first challenges she faced was the need to improve patient throughput and flow. That meant getting the staff to evolve from “the way things have always been done” to a more efficient system.

“Many years ago, the staging unit existed in a different part of the hospital. Patients had to leave the staging area to go to the holding room and then on to the OR. A new unit was built and located closer to the OR, but the patient flow hadn’t changed,” she explains. “Patients were still moving from staging to holding, then handed off and checked again and moved to the OR. This added an extra 45 minutes to patients’ preoperative workup times.”

Even so, it took some effort to persuade the team that a change had to be made. “I partnered with a Lean coach, and we went through a value stream map and looked at a future state process,” Koch says. Completing that exercise helped the team to understand what was happening, and frequent staff meetings put everyone on the same page.

“We needed to get the team involved in examining patient throughput, and in July we implemented a new handoff from the staging unit directly to the OR,” she says. Now, only patients who need a block or an epidural go to the holding area.

“We talked a lot about privacy and handoffs,” she says. There’s more privacy in the staging area, which has closed bays, than in the more open environment of the holding room. However, because families may be with patients right up until they go into the OR, it’s important to make sure the patient is comfortable with letting the family hear what OR staff are discussing, such as when they go over the checklist, she notes.

“We had multiple different parts of this action plan, which included education for the staging nurses and for the circulators in the OR because things are different in those 2 areas. It helped us go from the low 70s to the high 80s in first case on-time starts.”

A similar problem existed in the endoscopy suites, she adds. Patients were leaving the endoscopy suites and going to the main postanesthesia care unit (PACU) regardless of type of anesthesia received, level of consciousness, and so on. “We put clinical guidelines in place so that patients who were awake and alert could go directly back to the inpatient unit, bypassing the PACU, and be discharged.”

Restructuring and defining responsibility

Koch found quite a bit of overlap among managers’ responsibilities when she joined the Muhlenberg team. “Some of the frontline managers didn’t understand the structure; some managers were working on the same things as other managers, and some things were being done in silos,” she explains.

“After I restructured and implemented leadership rounds within my core management group, I learned that the manager who had been responsible for the preop and postop areas and had worked here for at least a decade had never seen the inside of the OR suites. I also learned that the manager for the OR had not known some of the flow and processes for the preop area. We started asking ‘who’s the owner of this?’”

Responsibility charting and co-partnering were effective strategies. “When we were working on the throughput change, the manager for the preop unit had to spearhead that, but I made sure an OR manager was co-partnered with her,” she notes. “We’re all part of the big continuum of care, and everything we do impacts each other.”

Incentives and improvements

One way to help staff adapt to change is to give them a “quick win,” Koch says. To improve first case on-time starts, for example, staff reviewed the way in which patients moved from the waiting room to the OR. They found that patients who needed epidurals or blocks weren’t moved along sooner than others, and failing to do that created delays all along the process. Making a schedule change that began with how patients were prioritized and moved from the waiting room was a relatively simple fix for a vexing problem.

Getting teams to talk to one another and work together, and involving them in decisions about how to prioritize changes that are needed helps to get their buy-in, Koch says.

She has learned not to assume that something she’s familiar with is familiar to her staff. She has also found it’s important to distinguish between the way things are done at Cedar Crest vs Muhlenberg. One facility’s approach may or may not be better, and in some cases, neither approach is the best way to get something done.

In addition to reducing OR managers by 50%, Koch has had some turnover from voluntary departures, including 3 staff who recently retired and 2 PACU nurses who subsequently moved to Cedar Crest.

With more young, novice nurses coming on board, Koch says that her team of tenured nurses must learn how to teach the new
people and understand the generational differences. In addition, everyone must adapt to the move from 12-hour and 8-hour shifts to more 10-hour shifts.

The volume of vascular, spine, and urology cases is growing rapidly, and it’s anticipated that pediatrics will have to be integrated into the workflow for adult patients. Space constraints still hamper efficiency in OR case picking and storage, so improvements in those areas are needed.

Staffing will continue to be a challenge because of retirement or other reasons people may want to leave. But Koch feels that the restructuring that has been completed has eliminated redundancy, clarified role responsibility, and improved efficiency. “Sometimes people mistakenly believe another manager needs to be hired when there’s a problem, but more isn’t always better,” she says.

—Elizabeth Wood

This article originally appeared in OR Manager, April 2014;30:11-12.
Bristol Hospital had a supply problem. Instruments were often missing from case carts, so nurses had to scramble to find the items on the morning of a scheduled procedure. Staff wondered whether the problem was caused by shortages, but a Lean process revealed an entirely different scenario and forged a pathway to improvement.

Getting started

The 93-year-old community hospital serves the town of Bristol, Connecticut. With 134 licensed beds, 8 operating rooms, an endoscopy suite, and an outpatient surgery room, the hospital has a volume of about 400 surgical cases each month.

In 2011 the hospital had launched a completely electronic medical records system that included inventory management. Around the same time, the executive leadership team identified Lean thinking and Lean processes as a strategic initiative. In 2013 they assembled 7 Lean teams, giving each a specific charge. All team members were expected to earn Lean Six Sigma Green Belts in the process.

The team tasked with addressing OR supply consisted of the OR director, the OR nurse manager, the central sterile supply (CSS) manager, a perioperative business manager, and others from outside the OR, including the information services manager, individuals from purchasing, and the chief financial officer.

“In perioperative services, we had a global charge to look at inventory management, including the dollar value of what’s on the shelf, how often it turns over in a year, and whether we had the right number of each item on our shelves,” says team leader Lynne Ramer, MSN, RN, CNOR, clinical operations director, perioperative services.

The team was under pressure because the hospital had just hired 2 new surgeons in September 2013. One was an orthopedic surgeon who could perform 6 to 8 procedures a day. The way Bristol’s supply cart system was working at the time, however, meant the staff couldn’t have handled the increase in productivity, says Diane Bouffard, MHA, BSN, RN, CPHQ, LSSBB, system director of quality improvement and holder of a Lean Six Sigma Black Belt certification.

“We knew we had to speed up processes for increased throughput,” she says. “If the supply wasn’t on the cart, we would have to delay a case while someone went to find, clean, and sterilize the equipment. So our challenge was, how do we make this more efficient so that every cart would be ready when the procedure was scheduled to start?”

Unlike larger hospitals, Bristol’s OR does not have a central core. Instrumentation and packs are kept in CSS, and soft supplies are stocked in multiple areas within the OR. As it turned out, that was a big part of the problem. But it wasn’t the only one.

Identifying the problems

After an extensive 2-week data collection and audit process, the team concluded that inventory wasn’t the issue. “We looked 360 degrees at our supplies, how they’re ordered, how they arrive, how they’re decremented and reordered, and how the patient is charged,” says Ramer, who has a Lean Six Sigma Green Belt.

They had on average an 84-day inventory supply on the shelf, with invoices paid every 90 days. “That meant we were using our inventory before we were paying for it. That’s a good thing. Our inventory was turning about 4 times a year. We were running a very tight ship,” Ramer says.

So why were 20 to 30 items missing from the carts each day? To find out, the team examined their process beginning with the booking of a surgical procedure and ending with the completion of the case cart.

For 2 weeks, they monitored every time a person touched a case cart and the number of minutes associated with each contact. They used several different Lean tools and techniques to map out what was happening, including process maps, Pareto charts, fishbone diagrams, and scatter diagrams.

“We had to do a lot of research to determine what part of our process was broken. We weren’t sure any of it was in the beginning,” Ramer says.

The discovery process took about 5 months and revealed several problem areas. Multiple people were picking instrumentation for the carts from both CSS and the OR, leading to errors. “We found that numerous people were involved, sometimes upwards of 5 to 7 people, and they weren’t always the same people,” Ramer notes.

Carts were being stocked from CSS 36 to 48 hours in advance of procedures, and instruments were often tied up on carts meant for the next day. Nurses would take instruments from those carts, so those items would be missing the next day, and the cycle would continue.

“People were stealing off each other’s carts,” Ramer says, adding that nurses were supposed to record these events but often didn’t. “Sometimes they got pulled away or their shift ended. The whole process was really flawed.”

According to Bouffard, “Historically, nursing staff members tend to be hoarders. As a nurse, you want to make sure you have all the supplies you need without having to chase after them.”

She points out that this type of problem is less likely to happen in a larger hospital where supplies are stored in the central core or in central sterile departments that are stocked with both soft and hard goods with centralized logging. In contrast, Bristol staff lacked control of the process.
The practice of stocking the case carts far in advance had originated to accommodate the schedule of a CSS employee who could only work from 3:00 am to 11:30 am. Because there wasn’t much else to do at that hour, she had been instructed to pick the instruments for the appropriate case carts 2 days in advance.

As so often happens, that practice became entrenched, as did the subsequent scrambling and stealing on the day of procedures. “People were stuck. You find that in every OR. They all have their quirks. We asked why in our drill down multiple times. Frequently, the answer was, ‘it’s because we’ve always done it that way,’” says Bouffard.

The Lean process also revealed that sterilization equipment did not meet the surgical case load demand, and certain surgeons wanted a wide variety of instruments kept handy even when they were unlikely to be used.

At baseline in September 2013, total case cart picking time ranged from 748 minutes to 1,573 minutes, with great variability from 1 day to the next.

Changing processes

Once the team identified the problems, they created a flow diagram or value stream map for how they wanted the cart preparation process to work, given that the physical supply room locations couldn’t be changed.

“Having a small central supply area on 1 floor and the soft goods area on another floor doesn’t make it easy to move back and forth. In ‘Leaning’ it, we tried to make it as easy for nursing staff as possible, so they were doing less running around,” Bouffard says.

The team altered the schedules and responsibilities of both CSS and perioperative services staff. They designated 1 staff member in CSS to pick the instrumentation for the carts and 1 person in the OR to pick the soft goods. They also changed the timing so that carts were prepared within 24 hours of the procedure.

Here’s how they mapped out the workflow:

- Noon: OR prints the doctor’s preference card and CSS prints the pick list from the preference card.
- 1:00 pm: OR picks the soft goods.
- 2:00 pm: OR sends the soft goods to CSS on the sterile elevator.
- 7:00 pm: CSS picks equipment and instrumentation, and marries the cart items together.
- 8:00 pm: CSS brings the first 2 complete carts upstairs. The cart for the next morning’s first case goes to the OR, and the second cart goes to a nearby room. The rest of the day’s carts stay in CSS until the signal from the OR that the prior cases have been completed.

The morning of the procedure, the nurse verifies the case cart’s accuracy. If anything is missing, she calls CSS to have the item brought to the OR. If not, she wheels the cart into the OR and the case is started.

Measuring success

The team pilot tested the plan for 2 weeks. By the end, case cart accuracy had improved 10-fold, with the missing list dropping from 20 to 30 items to 0 to 2. If those remaining 1 or 2 missing items showed up repeatedly, they were considered to be in short supply and more of those items were ordered so that they disappeared from the list. By November 2013, total case cart picking time had dropped to a range of 543.5 to 1,013.9 minutes, with far less variability.

Some of the nurses were initially hesitant about changing their usual way of doing things. “But they found out how much time they were wasting running around looking for instruments. It ended up ultimately being this incredible win-win situation,” Ramer notes.

A couple of the surgeons also needed some coaxing to accept the new instrumentation flow, but eventually they came around.

Key to success from an OR manager perspective, Ramer says, is the ability to “think outside the box, challenge the norm, and to have crucial conversations about important topics.” And Bouffard advises: “Walk your environment, observe what’s going on, and look for the waste. Use your data to make decisions and drive change in your organization.”

Miriam E. Tucker is a medical journalist in Bethesda, Maryland.

This article originally appeared in OR Manager, April 2014;30:22-23, 25.
Rounding tool off to a good start in improving patient satisfaction

A mobile, web-based rounding tool is allowing the perioperative leadership team at Vail Valley Medical Center (VVMC) in Vail, Colorado, to collect, analyze, and report on information gathered from surgeons, staff, and patients to improve quality of care and move toward high reliability.

Software designed by MyRounding Solutions in Littleton, Colorado, was customized to VVMC and downloaded into an iPad (www.myrounding.com). Icons and simple navigation menus make rounding, data gathering, and tracking of trends simple.

“MyRounding is so great because it is so portable, and the software is very easy to use and navigate through, whether you are computer literate or not,” notes Mary Jo Steiert, BSN, RN, CNOR, director of perioperative services at VVMC.

VVMC is a community hospital with 4 rooms in its main OR, 4 rooms in its adjoining surgery center, and 4 rooms in its surgery center in Edwards, Colorado, which is 4 miles from Vail. VVMC also includes the Steadman Clinic, a world-renowned orthopedic clinic, and the Steadman Philippon Research Institute, where 9 orthopedic fellows a year develop their surgical skills.

Though perioperative services just began using the VVMC-specific MyRounding in November 2013, the hospital has been working with Safer Healthcare (http://www.saferhealthcare.com/) since the beginning of 2012 as a test site for developing the tool for use in their high reliability training.

Safer Healthcare (Littleton, Colorado) is a training, consulting, and healthcare products firm that focuses on establishing a patient safety culture through creating high reliability healthcare organizations. “Rounding to influence” is 1 element of an evidence-based bundle of leadership methods used in highly reliable organizations.

Structured and consistent rounding also has been found to increase patient satisfaction and improve HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems) scores. MyRounding uses HCAHPS best practices and patient-centered scripts.

Everyone on the VVMC perioperative leadership team has their own iPad with the MyRounding software, including Steiert, the perioperative educator, perioperative nurse liaisons, specialty team leaders, and charge nurses in the OR, preoperative area, and postanesthesia care unit.

Leadership rounding questions

For her leadership rounding, Steiert has a set of questions in the iPad for the surgeons and a set for the staff, with icons for each. (See sidebar.)
Is there anything you can think of that is not working well in this unit or department?

“I can record their voices when they give me their answers, or I can put the data into the iPad as we are talking,” says Steiert. “I also can take photographs, so if I am on a unit and I see something that my staff doesn’t like, I can take a picture of it, and that can be stored data as my justification for my rationale to make a change.” (See sidebar.)

Questions for surgeons

For the surgeons’ questions, Steiert touches the surgeon icon and a script and questions appear, and then she records the surgeons’ answers.

The script begins with: “Dr X, would you mind spending a moment with me to talk about patient safety and quality improvement in the OR? We are trying to be proactive and address any concerns and capture any ideas that you may have that can help us improve our patient care.”

• On a scale of 1 to 5, how would you rate the quality of nursing in the OR?
• Are there any concerns or ideas that you would like to share about patient safety here in our OR? Yes or No.
• Are there any quality improvement projects that you think would be beneficial to our department? Yes or No.
• On a scale of 1 to 5, how satisfied are you overall here in our department?
• Is there anything I can do personally to help you make your practice in our OR more effective? Yes or No.
• Is there anyone who you would like to recognize for going above and beyond the norm?

At the end of the interview, Steiert presses a button to save and start a new interview.

“It works quickly,” says Steiert. “About 5 minutes of their time is all I need.”

Nurse liaison rounding questions

After a nursing liaison position was added in November 2013, a series of questions were created for the nurse liaisons to ask patients and their families. Two nurses share the position.

Questions for patients

• Do you understand your plan of care and what to expect from admission to discharge? Yes or No.
• Is there any additional information that you would like, or do you have any questions? Yes or No.
• Do you feel that all members of your care team understand and agree on your plan of care? Yes or No.
• Do you feel like you had a voice in your plan of care with all members of your care team? Yes or No.
• Do you feel like we have kept your family members up to date and informed about the progress in your procedure today? Yes or No.

• Is there anything we could have done better to help you or your family? Yes or No.
• Do you have any last questions or concerns?

Questions for the family

Questions the nurse liaison asks family members begins with a script: “I just want to check in with you to see how you are doing and give you an update.”

The nurse then tells them about the current status of the patient and asks the following questions:

• Is there anything I can do to make you more comfortable while you are waiting? Yes or No.
• Is there any additional information you need, or are there any questions I can answer for you? Yes or No.
• Are you able to follow the progress of your family member using our patient board? Yes or No.
• Would you like me to continue to check in with you to monitor the situation? Yes or No.

“I like the last question, especially,” notes Steiert. “Knowing the nurse will be there if they have questions is comforting to them.”

Trending the issues

With the stored information, the MyRounding software identifies trends and issues and compiles statistics on the data.

“The tool helps us close the loop on issues because it trends the issues, which helps us resolve them,” says Steiert.

For example, 1 of the top trends identified was that staff and surgeons were focused on getting first-case patients into the OR on time. A corresponding trend was that patients were delayed going into the OR because their H&Ps weren’t on the chart.

An A3 Lean methodology was used to determine why the H&Ps...
weren’t on the chart and what needed to be done to have them on the chart in a more timely fashion.

“We worked with the surgeons’ offices, PAs, fellows, and IT to discover the obstacles and how to overcome them,” notes Steiert.

As a result, Steiert says, they figured out the latest possible time to stop looking for an H&P, call the surgeon, and get the patient into the room on time. “One thing nurses don’t like to do is call the surgeon, especially for the first case of the day, saying ‘we can’t find your H&P,’” she says.

Steiert says they worked backward to accomplish this, asking: “If we want the patient in the room by 7:29 am, what needs to happen before that time?”

It helped create a whole process for standardizing work, she says. For example, they are trying to standardize all the work the night nurses need to do to have things ready for the day shift for the first case of the day and what the evening shift needs to do to help the night shift. “It has sparked more work than we have time to do, but it is fun and people are getting energized,” says Steiert.

Another example: A hand surgeon from the Steadman Clinic was doing a case during the Thanksgiving holiday when the ski slopes opened, and many people were coming in with injuries. There was a particular elevator missing from 1 of his hand sets. When Steiert did her rounding the following Monday, she asked him how things went over the weekend because she knew he had been on call. When she asked him if he was satisfied with the care his patients received or if there was something they could have done to make it better, he answered: “Yes, we could only find 1 Kleinert-Kuts elevator for this special procedure.” He said the procedure was designed by these 2 surgeons and it goes better when their elevators are used.

Steiert went to the surgical processing department and asked how many Kleinert-Kuts elevators they had and if they were included in the hand sets or if they were put up separately in peel packs. She found they were down to 1 elevator, and it was in a peel pack. She ordered 5 additional elevators so 1 could be in every hand set.

She followed up with the hand surgeon the next day, telling him she had ordered 5 more that would be in all of the hand sets the following week.

**Effectiveness of tool**

Steiert says in the next 3 months they should have a lot more data and will be able compare surgeon, staff, and patient satisfaction before and after they began rounding with the tool.

Perioperative leadership surveyed staff and surgeons before they started rounding about their level of satisfaction with the way things were going in the department. In a few months, they will do a post-survey to see if there is a difference.

Already, Steiert says, comments from surgeons, the executive team, and staff indicate they have noticed an improvement in patient care and customer service. Instrumentation and equipment is ready sooner, and patient satisfaction scores have improved across the organization.

—Judith M. Mathias, MA, RN

**Resources**

http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/HospitalHCAHPS.html

http://www.ihi.org/knowledge/Pages/Publications/RoundingtoInfluence.aspx


*This article originally appeared in OR Manager, March 2014;30:1, 6-9.*
Team participation and planning produce quality handoffs

After a poor handoff from the OR to the postanesthesia care unit (PACU) was identified as the culprit behind a serious adverse event, Nancy Robinson, DNP, MSN, RN, LHRM, CCM, made it her mission to avoid a recurrence.

“I’m passionate about safe patient hand-offs,” says Robinson. “I didn’t want this to happen to another patient.”

Robinson, who is director of education at Health Central Hospital, Ocoee, Florida, part of the Orlando Health System, tackled the project of improving handoffs as her doctorate in nursing capstone project, working closely with Marcia Olieman, MBA, RN, director of surgical services. The result was a tool that has boosted OR and PACU nurse satisfaction and is still being used 2 years later.

In 2006, the Joint Commission launched a National Patient Safety Goal for implementing standardized handoffs, and in 2013, the Commission’s Center for Transforming Healthcare released Improving Transitions of Care: Handoff Communications. The tool is based on the acronym SHARE: Standardize critical content, Hardwire within your system, Allow opportunity to ask questions, Reinforce quality and measurement, and Educate and coach.

Many hospitals are using these principles when they address how to conduct a handoff, which seems to be a simple task. But like a young person in whom a surgeon unexpectedly finds cancer, appearances can be deceiving. Handoffs aren’t simple. An effective handoff requires commitment, coordination, and yes, a bit of passion.

The value of handoffs

OR leaders, clinicians, and other administrators intuitively know that accurate handoffs help prevent errors that can harm patients. But handoffs can also improve outcomes. A study of 1,507 neonates, infants, children, and adults published in the Joint Commission Journal on Quality and Patient Safety found that using a structured handoff when transferring patients from the cardiovascular OR to the cardiac ICU significantly reduced the number of unplanned extubations and the amount of time patients were on the ventilator.

“The handoff protocol definitely contributed to those results,” says Mark Twite, MD, BCh, MB, an anesthesiologist at The Heart Institute of Children’s Hospital Colorado in Aurora and 1 of the study’s authors. Having an awareness and a structure to the handoff “shows we think it’s a really important part of patient care,” he says. For example, when the anesthesiologist tells the nurse and the respiratory therapist where the endotracheal tube is taped, both clinicians will know to speak up if they note a small difference in placement.

Dr Twite attributes the reduction in ventilator time to setting expectations. “That helps the ICU team decide on who to fast-track for extubation, and the anesthesiologist, surgeon, and nurse are all on board with the plan. Everyone is hearing the same message.”

Assemble the right team

Like professional coaches, OR leaders must strive to build the best team possible to attain success. “It’s hard to get everyone to come to the table,” Olieman acknowledges.

At Health Central Hospital, a community hospital that has 8 ORs and performs nearly 5,000 procedures a year, she and Robinson surmounted that challenge by drafting champions from each area affected by handoffs to be on the team. The chief of anesthesia and a certified registered nurse assistant know for his strong patient advocacy, along with representatives from the PACU and the OR, comprised the team. These leaders were able to help “bring reluctant ones into the fold,” says Olieman. The interdisciplinary team also managed to break down silos, getting staff from various departments to talk more about issues beyond handoffs.

Ina Cherepaha-Kantorovich, MN, RN (EC), advanced practice clinical educator for the preadmission, PACU, endoscopy, and cystoscopy units at Toronto General Hospital in Ontario, Canada, suggests asking for volunteers to fill staff spots on the team. The working group for handoffs facilitated by Cherepaha-Kantorovich and Maria Masella, MN, RN, educator in the OR, included 4 staff nurses from the OR and 4 from PACU.

“You also have to have organized meetings and follow-up during implementation so the process doesn’t fall apart,” she adds. “Include staff all the way.” Cherepaha-Kantorovich and Amanda Zakrzewski, a PACU staff nurse, spearheaded the process. Think outside the box; a nonclinical person can be a great facilitator, says Mary Grzybinski, BSN, RN, administrative clinical advisor for PACU at Beth Israel Deaconess Medical Center (BIDMC) in Boston. A staff member from the business transformational office who is embedded in the perioperative area helped the 10-member multidisciplinary BIDMC team establish an effective handoff procedure.

“We are focused on clinical, so we don’t always see how to attack a problem from a bigger picture,” Grzybinski says. The business staff member “helped us see the business end and keep us focused.”

Analyze the process

Many OR leaders use Lean tools to analyze the handoff process. A value stream analysis showed the team at Health Central Hospital deficiencies in the current process, Robinson says. The team at BIDMC also performed a value stream analysis and identified several categories of changes that could be made.

“The value stream map helped us know how everyone perceived handoffs so we were on the same page,” Grzybinski says. Team members learned what others needed from them.

“PACU nurses sometimes only got part of a patient’s information because the provider didn’t realize that the whole picture made a difference in the case,” she says. “Then we did an impact difficulty
analysis grid that helped us analyze the difficulty of fixing each problem and the impact fixing that problem would have on improvement in handoffs. Communication had the highest difficulty and the highest impact, so we decided to tackle that.”

The team created an affinity diagram that examined 4 areas: communication before transport, post-transport communication, disposition of the patient, and communication interoperatorically to the unit that will receive the patient after surgery (see sidebar). Strategies were identified to address each area.

Robinson says a factor that’s easily missed in an analysis is whether people are focused on the handoff or on the task. When observing handoffs from the OR to the PACU, she was struck by the fact that participants were doing many tasks while trying to receive important patient information.

“When you are performing tasks and receiving information simultaneously, you don’t retain what you are being told,” she says. That led to the creation of a “no fly” zone—report is not given until basic tasks, such as connecting the patient to the monitor and oxygen, are completed, so the PACU nurse can give the other clinicians his or her full attention.

Another vital part of the analysis is examining attitudes. “The biggest challenge for making the change wasn’t the surgeons, it was the OR nurses,” Cherepaha-Kantorovich says.

In fact, OR nurses didn’t like the initial tool, saying it didn’t reflect what they did. A survey revealed OR nurses felt “devalued” because the PACU staff weren’t paying attention to what the OR nurses were saying. The PACU nurses revamped their approach, and the process was revised so that it better reflected contributions from the OR nurses.

Put the process in place

Protocols, especially those incorporating checklists, are a frequent—and effective—solution to handoff challenges. For instance, a 2013 study in Pediatric Anesthesia found that a checklist dramatically improved the quality and reliability of the handoff.

Olieman recommends allowing protocols to develop organically. “We kept the flow of information during the handoff loose at first so that it could be developed, and then we standardized so it included what each person needed to know,” Olieman says.

Ultimately, the team developed a paper tool (see sidebar). Olieman says the paper format is key to the tool’s success: “When a nurse gets a patient, she needs to know information really fast without flipping through a dozen computer screens.” The tool, which isn’t part of the permanent patient record, provides that.

“Although some people might think it’s double documenting (because some of the information on the tool has to be entered into the computer), it’s not,” Olieman notes. “It’s not hard and it’s not complicated. It’s like a worksheet.”

The tool has expanded so that it starts in the preoperative area and travels with the patient through the OR, the PACU, and onto the nursing unit.

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Handoff Communication Guidelines

PERIOPERATIVE PEARLS

Patient name: __________________________

Agr. ______________ Allergies ________________

Procedure performed ____________________________

Primary language spoken: English □ other:

Past medical history: □ Diabetes □ HTN □ COPD □ Asthma □ OSA □ Renal Disease □ Seizures □ Cardiac □ CAD □ PVD □ CVA □ Liver Disease □ TOEH □ Smoking (ppd ___) □ Arthritis □ MRSA □ VRE □ TB □ CIff □ Daff □ HOH □ Blind Position during surgery: □ supine □ prone □ lithotomy (type of stirrups: □ candy cane □ allens) □ jack knife □ other

Precautions: □ falls □ Seizure □ Aspiration □ Decubitus □ Isolation □ Contact □ Droplet

Personal Items: □ Dentures □ Glasses □ Hearing Aids □ Prosthesis (_______)

Pain management: □ PCA pump □ Epidural □ On-Q pump □ other

Extremities: □ Tend hose □ SOD □ pulses

Adverse events intraoperative

Equipment needs: □ CPM □ Ventilator □ Wound Vac □ NGT □ Cell saver

Elimination: □ Foley □ Suprapubic tube □ I&O □ Straight cath

Assessment: □ Skin □ Incision □ Packing □ Musculoskeletal □ Neuro

Drains: □ JF □ Hemovac location: __________ □ Penrose □ Blake tube

Dressings: □ Chest tubes □ Rf □ LFT □ Urology stents □ Rf □ LFT □ G tube

Labs due: □ H&H □ BMP □ CBC □ PT/PTT □ T&C □ Accucheck □ Blood sugar □ ABG □ Critical values:

Lines: □ Central □ Arterial □ Peripheral □ Location:

Drains: □ JP □ Ventilator □ Wound Vac □ NGT

Antibiotics: □ Yes □ Time last dose: __________ □ No

Vital Signs: Temp: □ HR □ BP □ RR

Relationships: □ Family location: ____________

RadioLOGY: □ CXR □ Other

Labs: □ H&H □ BMP □ CBC □ PT/PTT □ T&C □ Accucheck □ Blood sugar □ ABG □ Critical values:

Lines: □ Central □ Arterial □ Peripheral □ Location:

Blood products: ____________

Special devices: □ Pacemaker □ AICD □ Insulin pump □ Other

Special needs: □ DVT protocol □ Specialty Bed

Spiritual needs: ____________

Special communication needs: □ Sign language interpreter □ Interpreter

Surgical Unit: □ SCU □ OSU □ CVCU □ ICU □ PCU □ IMCU □ MSU □ TMU

This worksheet, which facilitates handoffs, is not part of the medical record.

Source: Health Central Hospital, Ocoee, Florida. Used with permission.

Sample narrative script

This is an example of the narrative scripts used at Beth Israel Deaconess Medical Center, Boston, to remind providers what information to provide. Among the other scripts are 1 for the anesthesia provider to the RN circulator and 1 for the anesthesia provider to the RN receiving the patient after surgery.

Narrative script: RN circulator to receiving unit

Sender (RN Circulator) Hi, We are finished in room __________, Dr _______ patient_________, who had a _______ procedure. He/she will need the following:

- Ventilator or specific respiratory set up (eg, t-piece)
- Drips and patients weight
- Invasive monitoring set up
- Precaution status
- Epidural

Receiver (Receiving RN) Thank you OR I need clarification of the following:

Sender (RN Circulator) Can we have a slot/room?

Receiver (Receiving RN) Thanks for the information. You can go into slot/room _______ OR we will call you back with a slot/room.

Source: Beth Israel Deaconess Medical Center, Boston. Used with permission.

“It’s color coded, so each unit has ownership for their section,” says Robinson, who adds, “It’s not just a piece of paper; it’s a process by how we can make the patient’s trajectory through the
system safe and meet regulatory agency requirements.”

BIDMC’s guidelines “spell out what happens from step to step, whether the patient is going to the PACU or the ICU,” says Grzybinski, adding that scripts help everyone remember what needs to be included (sidebar). “Otherwise, people tend to tell what they think is important, which might not be what’s important to the other person,” she says, citing situations in which the anesthesiologist fails to mention the patient doesn’t speak English or can’t hear at all without his hearing aids.

“We try to broaden the horizons of all providers,” Grzybinski says. “It’s not just what one provider needs; it’s what we all need to take excellent care of the patient.” Laminated cards of the scripts are available.

The structured handoff used at Children’s Hospital Colorado outlines the order of report. After the patient is on the ICU monitor and the vital signs have been checked, the OR nurse and ICU nurse both verify the patient’s identification. The cardiac surgeon or fellow gives report, followed by the anesthesiologist or anesthesia fellow and the OR nurse.

Dr Twite says the team in the cardiovascular ICU then does a “wrap up, going through the plan for the patient—hemodynamic goals, where we are going with extubation, the plan for sedation—and at the end they cover any questions or concerns. Then the ICU assumes official care of the patient.”

Whatever the process, Cherepaha-Kantorovich emphasizes that consistency is vital even if that means standing firm. “If a surgeon or OR nurse didn’t come, the PACU nurse didn’t accept the patient,” she says. “You need the consistency so that people understand it is serious; it’s important for the patient’s safety.”

She and the OR nurse educator made sure they were available to staff to facilitate implementation, and now the process is standard practice.

The time factor

Rapid throughput is essential for a successful OR, so staff and leaders worry about the time spent on handoffs. Fortunately, this fear is often unfounded. “There was some reluctance [among] OR nurses to participate,” says Robinson. “They were eager to get back to the OR to start the next case.” By eliminating the inefficiencies discovered through the value stream analysis, however, nurses easily found the time they needed.

“Taking time up front can save time later on,” Cherepaha-Kantorovich adds. The handoff takes about 5 minutes and replaces the multiple calls PACU staff used to have to make to the OR to obtain missing information.

And, of course, time isn’t standing still in the OR while the nurse is in the PACU or ICU. “While we are doing the handoff, our team is doing the room turnover,” says Dr Twite. He says the entire team agrees that any delay “is a small price to pay for accurate handover of patient information. An accurate handover is part of excellent patient care and excellent outcomes.”

Follow up

To ensure the handoff process meets the team’s needs, it’s helpful to survey clinicians at key intervals. Robinson used a Likert scale to assess satisfaction among OR and PACU nurses before and after implementation. After implementation, satisfaction increased in both areas, with a particularly dramatic increase among OR nurses. “[The handoff process] helped them put aside the task part of the job and remind them why they became perioperative nurses,” Olieman says in accounting for the increase.

Cherepaha-Kantorovich surveyed staff before and after implementation and 1 year later. “The final evaluation was very positive,” she says, adding that the new process has now been in place for 18 months. Most surgeons and PACU, OR, and anesthesia staff believed the handoff tool had improved communication and helped to convey accurate patient information to the PACU staff.

A commitment to patient safety

“Anytime there is a change, it’s hard,” Robinson says. “But this [handoff tool] has become hardwired into the process.” Olieman says the tool is part of orientation and that the perioperative nursing council has taken ownership of it. Perhaps the most exciting payoff for the team at Health Central Hospital was that in 2012 they received an award from the Florida Hospital Association.

So what advice does Olieman have for other OR nurse leaders planning to work on handoffs? “Don’t be afraid to take on the big, scary project. It was overwhelming, but we did it.”

—Cynthia Saver, MS, RN, is president of CLS Development, Inc, Columbia, Maryland, which provides editorial services to healthcare publications.

References


This article originally appeared in OR Manager, March 2014;30:1, 10-13.
Surgical case delays have been found to last an average of nearly 17 minutes. Not only do such delays make surgeons dissatisfied, they also reduce case volume and related revenues, and they may lead to additional time under anesthesia for patients.

The root causes of instrument-based delays are seldom simple, and long-lasting, culture-based solutions prove elusive in many facilities.

Managers in the OR and sterile processing department (SPD) at Wesley Medical Center in Wichita, Kansas, had tried unsuccessfully over the years to address recurrent instrument issues. In 2011, following management consultant Peter Drucker’s mantra that “what gets measured gets managed,” we outsourced our sterile processing to improve instrument readiness and to measure and benchmark performance.

As a result, we significantly improved key performance indicators (KPIs) in this area within 180 days, and over 3 years, we reduced dirty instruments by 94%, tray errors by 86%, immediate-use sterilization by 77%, and unprocessed trays by an average of 94%.

### Process improvements

A key resource for our process improvements was access to a national database of KPIs related to instruments, sterile processing, and OR throughput, maintained by our SPD outsourcer, Integrated Medical Systems International, Inc. (IMS).

(KPIs are performance measurements designed to evaluate an organization’s success in achieving and maintaining operational standards or meeting strategic objectives.)

The first step was to educate OR and SPD staff about the interdependent relationship between their departments. The KPIs would improve only if the 2 teams worked together to resolve issues.

Instead of casting blame, OR and SPD staff had to understand how their actions contributed to or detracted from overall performance.

A survey of our surgeons enabled us to identify surgeon hot points to address aggressively within the first 180 days. Surgeons were asked to rank these and other questions on a 5-point Likert scale that ranged from “very dissatisfied” to “very satisfied”:

<table>
<thead>
<tr>
<th>KEY PERFORMANCE INDICATOR (Metric)</th>
<th>Baseline</th>
<th>6-Month AVG (Month Ending)</th>
<th>%Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2011</td>
<td>2012</td>
</tr>
<tr>
<td></td>
<td>Jan - Jun</td>
<td>Jul - Dec</td>
<td>Jan - Jun</td>
</tr>
<tr>
<td>OR Frictions / Case</td>
<td>13.82%</td>
<td>9.93%</td>
<td>6.41%</td>
</tr>
<tr>
<td>Dirty Instruments / Case</td>
<td>3.34%</td>
<td>1.35%</td>
<td>0.85%</td>
</tr>
<tr>
<td>Daily AVG Unprocessed Trays / Daily AVG Processed</td>
<td>19.47%</td>
<td>9.31%</td>
<td>8.69%</td>
</tr>
<tr>
<td>Tray Errors / Total Sterilized Items</td>
<td>1.44%</td>
<td>1.05%</td>
<td>0.67%</td>
</tr>
<tr>
<td>Immediate-Use Sterilization / Total Sterilized Items</td>
<td>2.20%</td>
<td>1.62%</td>
<td>1.36%</td>
</tr>
</tbody>
</table>

*Note: Based on 257 surgeon surveys. AVG = average; surgeon satisfaction survey scale: 1 = very dissatisfied; 5 = very satisfied.*
• Are cases delayed due to instrumentation?
• Do surgical instruments function correctly?
• Is sterile processing responsive to your needs?

Based on the evaluation of on-site assessments, the following KPIs were targeted for improvement:
• Dirty instruments
• Unprocessed trays
• Tray errors
• Immediate-use sterilization loads
• Post-case audits
• OR frictions.

A 5 × 4 foot dry erase board was installed in the SPD to track performance. A white board may sound like a small thing, but it is essential for keeping staff focused on ongoing goals. In addition, the white board created a level of conscientiousness around these KPIs that began to seep into the culture of our surgical unit. SPD tracked activity in real time, noted trends and discussed them with IMS weekly, and reviewed them with facility administration monthly.

These metrics serve as a visual reminder of the initial barriers we faced, our progress over time, and any recurrent issues that required a more intense focus and discussion.

KPIs were tracked in conjunction with a central sterile process management program that included Lean process implementation, staff training and certification programs, inventory and equipment management, OR liaisons, and regular audits and adjustments of all processes. Lean processes implemented included:
• Linearized workflows
• Establishment of visual cues
• Elimination of non-value-added activities (excess steps or material usage).

Results measured over 6-month periods for 3 years are shown in the table (see sidebar).

A key objective was reducing the incidence of OR frictions, ie, factors that may negatively impact the OR, such as missing instruments, incomplete case carts, instruments not functioning properly, or insufficient instrument volume. Over the 3-year period, our success in this area was dramatic (see sidebar). Some of the variability in the monthly trends can be attributed to external factors such as department construction, employee turnover, and equipment maintenance.

Lessons learned

All of these improvements were rewarding, but we learned that there is no quick fix for instrument readiness, surgeon satisfaction, and other instrument-related issues. Continuous assessment, training, communication, and intervention are required.

Top management must support change but cannot drive it. Even though this started as a top-down initiative, we continue to achieve our success from the bottom up. Everyone is actively participating: the OR and SPD technicians who monitor the boards daily, the supervisors who manage the process, and the business managers and directors who champion continuous improvement and cultural changes. The C-level executives look forward to quarterly business reviews where we can monitor and evaluate our progress.

“Establishing effective communication between the OR and SPD was essential,” says Randall Smith, the IMS clinical operations manager who manages our SPD. “Everyone wanted the same final outcome, but at times there seemed to be a disconnect between the 2 teams, and it affected processes. Today we have a
system that encourages open communication, measurement, and assessment, and this has facilitated root-cause analysis when issues do occur. We now have shared goals and objectives between the OR and SPD, and we have built a cohesive team that shares feedback without blame.”

When instrument-related problems arise, our managers now have the tools to identify them quickly, work toward a collaborative solution, and move forward without blame or bad feelings.

Through this process, we learned a great deal about our surgical unit. For example:

- By accessing IMS’ national database, we were able to ascertain the length of the average instrument-related case delay. Using research showing that OR downtime costs an average $60 per minute, we projected the true cost of our delays and prioritized accordingly.

- Weekly meetings between OR and SPD representatives allow us to review the weekly KPIs, discuss problems, and make adjustments. Meetings remind us that we share the same goals, and we’re less tempted to develop an “us versus them” mentality.

- Most instrument issues occur in orthopedics, so we focused more intensely on those trays.

“The improvements gained through this process helped to reduce delays to ontime starts and improved satisfaction among our surgeons,” says OR staff member Logan Sorensen, RN. “The whole team worked together to make this happen.”

The surgeon satisfaction surveys gave us valuable insight. “The surgeon satisfaction surveys have been more and more positive as instrument-related processes have been improved,” says Cherise Becker, OR manager at Wesley. This feedback allows our executives to monitor our surgeons’ attitudes in the context of national norms and to respond accordingly.

We adopted a culture of consistent communication and documentation, leading to a pattern of measurable success. Bridging the gap between our OR and the SPD teams is the key to sustainable process improvements.

Kathy Neely, MSN, MBA, RN, is chief nursing officer at Wesley Medical Center, Wichita, Kansas.

References

http://tinyurl.com/ORefficiency


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In 2011, fewer than half of all first cases at Dartmouth Hitchcock Medical Center in Lebanon, New Hampshire, were starting on time. That meant subsequent cases were also delayed, with overtime costs exceeding $500,000 a year.

“People were unhappy with that for a lot of different reasons. It was a morale problem, but also a financial one. For every minute you delay a case, the OR loses money,” says Sophia van Hoff, MD, an anesthesia resident at Dartmouth Hitchcock.

The hospital had previously hired outside consultants to try to improve the situation, but without much success. In early 2012, Dartmouth’s Center for Perioperative services (tCPS) decided to try a Kaizen Rapid Process Improvement Workshop (RPIW), in which multiple front-line OR staff members from across the organization were brought together for an intensive 5 days to analyze and improve the morning OR intake process.

Linda D. Thompson, BSN, RN, CNOR, nurse manager for perioperative services at Dartmouth Hitchcock, says that previous attempts to improve OR on-time starts failed in part because they were trying to change the end of the chain rather than the front. “Through this RPIW work, we identified a lot of things preventing the patient from getting to the OR that had nothing to do with the OR.”

The RPIW and subsequent reinforcement brought Dartmouth Hitchcock’s on-time start rate—defined as delivering the patient to the OR suite within 5 minutes of the scheduled start time—from 47% in 2011 to 83% by about week 39, exceeding the 80% goal they’d targeted. Thanks to ongoing reinforcement, on-time starts have remained stable at that level over the nearly 2 years since, according to Daniel P. Herrick, the tCPS senior consultant for process improvement who led the effort.

The result has been an average 17% reduction in overtime costs, for a biweekly savings of about $3,081. “I do 8 to 10 RPIWs a year, and this one was very successful,” says Herrick, who holds a Lean Six Sigma Black Belt and a certified professional in healthcare quality certification.

**Advance work**

To prepare for the RPIW, Herrick and his tCPS team began collecting baseline data in October 2011, focusing on the time from when patients arrive in the morning and check in until they are wheeled into the OR suite.

The team determined that the most common reasons for delay during that time were related to missing or incomplete paperwork (34% of cases), late staff (surgical or anesthesia) (26%), and late or conflicting orders (20%). “There was less than opti-
mal utilization of resources,” Herrick notes (sidebar).

The goal of the RPIW, laid out in a pre-event “charter,” was to “optimize the process flows and patient handoff between the pre-op and the OR teams in order to maximize patient safety and satisfaction, staff efficiencies, and on-time surgical starts,” Herrick explains.

The RPIW event took place January 30 to February 3, 2012. The team of 13 consisted of 3 preoperative nurses, 2 anesthesia providers, 2 operations managers (including Thompson), 2 circulating nurses, 1 anesthesia resident (Dr van Hoff), a surgical technician, a support service technician, and a surgical resident.

**The RPIW week**

**Day 1**

Monday began with extensive education and training, which included the entertaining “Toast Kaizen” video of a man making toast in a very inefficient manner. The video was meant to illustrate how a familiar process can be improved to save time and increase efficiency (http://www.lean.org/Bookstore/Product-Details.cfm?SelectedProductId=126).

Thompson, who was participating in an RPIW for the first time, was impressed by the video. “That to me was huge. Watching this man make toast, seeing the dirty dishes in the sink—he could have done 20 things in the time he was waiting for the toast to pop. It’s so simple, yet how many times do we stand around waiting for something rather than efficiently using time?”

Herrick guided the team through several cycles of “process mapping,” in which each team member described exactly what he or she did on a typical morning, then mapped it out on paper.

They broke up into 2 to 3 groups for “Gemba Walks,” during which they picked a random patient checking in and observed the flow from admission to arrival in the OR. (Gemba Walks, a fundamental aspect of Lean management philosophy, are a way for staff to walk through a process to identify wasteful activities.) Then they returned and refined the process map, with each person’s role written with a different colored pen.

“We went through it multiple times. By the end of day 1, we had a really great visual process map of what’s going on with the patient and how it’s happening,” Herrick says.

For Dr van Hoff, the process was educational. “When I’m doing my things in the morning, I’m just thinking of what I need to do with the patient…. It’s really kind of eye-opening seeing what everybody else does and how the whole process works instead of just your one little piece.”

**Day 2**

On Tuesday morning, the team had more training, did another Gemba Walk, and did more mapping of the current state, includ-

### Key Process Improvements

**Get on Board with OR-Same Day Program Process Improvements!**

- **Same Day**
  - **Write your name on the white board outside the patient’s room**
  - **Tell nurse or write on the white board if new orders are added**
  - **Anesthesia will help out Same Day RN with IV starts when possible**
  - **Inform patients & families about one support person & ride home**
  - **Improve data collection & med reconciliation in pre-op phone call**
  - **Give, ask for, and facilitate surgical resident to Same Day RN handoffs**

- **OR & RN**
  - **Set target time for bringing patient back & only communicate if cannot meet expected time (first case is 0730)**
  - **Circulator will communicate with Same Day Desk (5:50PM) if >30 minutes ahead of or behind schedule**

### Key Process Improvements

- **Team** will establish target time for back in room and write on dry erase board.

- **Use computer** as time to go by.

- **Anesthesia** will proceed back by spread upon time with patient until they hear otherwise.

- **Communication** by OR & SDP Desk.

- **Preoperative** will call SDP desk 5:50PM if case > 30 mins. ahead of or behind schedule.

**Changing the timing of when certain preoperative tasks were performed helped improve start times.**

*Source: Daniel P. Herrick*
ing a “spaghetti chart” of the physical flow to the OR.

The team also performed a root cause analysis of the reasons for the delays and began brainstorming ideas for improvement. They created a “future state” process map of an ideal patient flow. Of approximately 31 ideas generated, each team member voted for his or her top 10. They ended up with fairly universal agreement on 9 key improvement opportunities.

Days 3-4

The team divided into groups to work on the different areas identified for change. They spent Wednesday and Thursday designing and testing Plan-Do-Study-Act (PDSA) cycles, or small tests of change using just 1 patient or 1 staff member. “If it doesn’t work, you tweak it and try again,” says Herrick.

As the PDSA cycles continued on Thursday, the team also began to create rollout training plans and to prepare a final report.

Day 5

While wrapping up the PDSAs Friday morning, team members drafted plans for rollout training, education, and communication of the new model. They gave a PowerPoint presentation to senior members of the organization and to the OR staff.

The following Monday, they began rolling out the changes (side-bar).

What worked?

Ask more the day before. One of the most successful changes involved pre-event phone calls. Typically, a preoperative nurse calls the patient the day before surgery to confirm the appointment time, answer questions, and provide instructions. In the old system, on the morning of surgery a preoperative nurse would ask the patient about medications, health updates, and social questions. Thanks to the RPIW changes, the nurse now includes those questions in the day-before phone call, thereby saving 5 to 10 minutes the following morning.

Asking about medications the day before surgery is also more effective because the patient can access them from home rather than having to list them from memory in the hospital, Herrick points out.

See the patient first. Another major change involved the circulating nurses’ morning flow. Pre-RPIW, nurses arrived at 7:00 am, set up the OR, and saw the patient in the preoperative holding area around 7:20, just before the scheduled surgery. If a problem arose—for example, observing that the patient was obese and would require different instrumentation—there would be a delay.

The RPIW team switched the schedule so the circulating nurse would see the patient at 7:05 am, before the OR was set up.

“For the RNs to go directly to see the patient preop was a big change in the culture of what we were doing. My role was to help staff see the benefit of that,” Thompson says.

Switch who calls whom. A third successful change shifted the default from requiring anesthesia staff to routinely call the OR to make sure the room was ready to requiring the circulating nurse to notify anesthesia if the OR was not ready.

“Previously,” Dr van Hoff says, “it wasted a lot of our time. You’d call and wait. Now, you assume they’re ready. If they’re not ready, they page you.”

The goal of all of this is to increase efficiency, she notes. People should be using the same amount of time they had before, but using it more efficiently, she explains.

Maintaining the gain

On-time starts improved to about 70% by week 20 after the changes were implemented, but then they plateaued. Extra encouragement was needed to nudge the rate up to the current 83%.

According to Herrick, not everyone embraced the change. “We talked to them. We told them this is the new practice, and here’s why change was made. We asked them to try it for 30 days.”

“Indeed,” says Thompson, “you always have your early adopters, middle adopters, and late adopters. I sent out a lot of emails asking people what they thought were barriers.” A good tip, she says, is to ask, “If you were to do this, what would it look like?”

Having everyone use the same script and providing a lot of positive reinforcement are key for success, she adds.

This past November, Herrick led another 5-day RPIW focused on room turnovers. “Now that the first case of the day is starting on time, we want to reduce the time between cases. We used the exact same format and came up with some extremely exciting improvements,” he says.

Miriam E. Tucker is a medical journalist in Bethesda, Maryland.

This article originally appeared in OR Manager, February 2014;30:1, 9-11.
The South Carolina Hospital Association (SCHA) and the Joint Commission Center for Transforming Healthcare have teamed up to make the state’s healthcare highly reliable.

In a joint project titled “South Carolina Safe Care Commitment,” 21 hospitals in South Carolina are learning about high reliability practices (sidebar).

High reliability is defined as consistent performance at high levels of safety over long periods of time. Highly reliable healthcare is care that is dependably excellent, every time, for every patient.

The multiyear project, launched in February 2013, was built on a combination of the work South Carolina was doing with a collaborative model to improve the quality and safety of patient care and the platform of work the Joint Commission had done around the 3 key components of highly reliable organizations, says Rick Foster, MD, senior vice president for quality and patient safety at SCHA.

The 3 components are:

- full leadership commitment and participation in driving a system to high reliability
- an organization-wide culture of safety
- system-wide application of robust process improvement (Lean, Six Sigma, Change Management) (figure).

“We have been very encouraged by the number of hospitals that responded initially,” Dr Foster says. “The 8 systems represent about 40% of patient discharges in the state, so it represents a pretty good percentage of our inpatient work.”

Leadership commitment

“Striving for high reliability is not just another project—it is a long-term commitment to fundamental and social change in our hospitals and health systems,” says Dr Foster. “We were very intentional about including the term ‘commitment’ in the name.”

Hospital CEOs cannot commit to the program and then turn it over to someone else in the organization to lead the effort. “We told them they need to turn it over to themselves and stay actively involved,” he says.

Participating hospitals sign a 3-year commitment promising that their CEOs and leadership teams will be actively involved. Those leaders are expected to:

- complete the Joint Commission’s High Reliability Self-assessment Tool
- perform a safety culture survey assessment
- use a common process to identify events of harm and close calls that will help facilitate the development of a standardized high reliability measure.

Ultimately, participating facilities will receive comparative information from peer organizations on these key high reliability metrics.

Self-assessment tool

Each hospital has a leadership team led by its CEO that participates in up to 3 inperson meetings each year with SCHA and the Center for Transforming Healthcare, along with a series of webinars and coaching calls.
During the first meeting, the teams were provided information on high reliability in general, and then they heard from hospitals that were already successfully applying practices to achieve consistent excellence in patient care.

Each hospital completed the High Reliability Self-assessment Tool developed by the Joint Commission and received a report back from the Joint Commission team. Hospitals used the report to move forward with their individual high reliability plans.

The South Carolina Safe Care Commitment is part of a beta testing group for the tool, says Dr. Foster.

**Standardized safety reports**

At the meetings, the SCHA and Joint Commission teams also looked at each hospital’s existing culture of safety surveys. All but 2 organizations in the state were using surveys from the Agency for Healthcare Research and Quality (AHRQ).

Dr. Foster says they are looking at a standard system for safety culture reporting and will begin using Healthcare Performance Improvement’s Safety Event Classification system as a uniform reporting system to allow hospitals to track near misses. This system is already being used by many hospitals that are moving toward high reliability, he says.

Healthcare systems differ from high reliability industries like commercial aviation, amusement parks, and nuclear power in that they tend to focus on reviewing and taking action only when harm actually occurs, whereas the other organizations also look at their near misses, says Dr. Foster.

“We hope to have a system that helps hospitals better track events that might lead to harm, which has been an area that has been difficult to measure,” he says.

By the second year, Dr. Foster says, hospitals should have better baseline statistics on their rates of harm and near misses.

**Safe Surgery program**

One of the preexisting initiatives SCHA is involved in that Dr. Foster says provided the foundation for their move toward high reliability is the Safe Surgery program. As part of this program, carried out in partnership with Atul Gawande, MD, and his team at Harvard’s department of health policy and management, Boston, all South Carolina hospitals committed to putting the World Health Organization’s Surgical Safety Checklist into routine use in their ORs by the end of 2013.

“When you look at the level of leadership engagement, the culture, the environment where staff work, and the opportunity to reduce invasive harm and near misses in the OR, there is no other area from a hospital standpoint where I think the principles of high reliability apply more,” says Dr. Foster.

SCHA has been working with every acute care hospital in the state as well as a number of ambulatory surgery centers to implement the checklist and change the way surgical teams communicate. They have been tracking process and outcomes measures, and they hope to complete a formal report by the first quarter of 2014, he says.
Collaboration and creative thinking hold down the number of OR holds

Collaboration and creative thinking hold down the number of OR holds. Patients who are ready to be transferred to a unit but don’t have a bed assignment are cared for by a medical-surgical nurse in the overflow area. “The nurse starts their medication, gives them pain medication, and does everything that’s needed, just like they were in their med-surg room,” she says, adding that a full-time medical-surgical nurse was hired to staff the area. The small individual rooms have walls, and each room has a television. Most importantly, family can stay with the patients. The area is located next to the PACU for easy access.

Holding multiple huddles

The team at LVHN has developed huddles into an art form. “Huddles are no longer than 5 minutes,” Hall says. “You don’t want to drag them out.”

Four huddles are held daily. The preoperative patient care manager, certified registered nurse anesthetist (CRNA), anesthesiologist assigned to the PACU, OR manager, and specialty OR managers attend the first huddle of the day, held at 6:30 am in the OR. The team reviews the cases for the day, verifying information such as whether equipment is available.

The second huddle is a “bed huddle,” held at 10:30 am with directors and patient care managers from the entire hospital. “We meet in the hospital auditorium and go over patient flow,” Hall says. At 12:30 pm, a third huddle is held in the OR and includes the preoperative or postoperative care manager, CRNA or OR manager, the anesthesiologist assigned to the PACU, OR manager, and specialty managers. “They go over the schedule for the next day so they can plan ahead,” Hall says. For example, if there will be several pediatric patients early in the day, the PACU can adjust staffing so more nurses are available earlier in the day.

The final huddle, at 3:15 pm, includes the postoperative care manager, the PACU charge nurse, and the holding room charge nurse. They look at the next day’s needs and adjust if necessary. Hall says huddles have had the most impact in reducing holds. “Before huddles, we weren’t proactive in planning and our staffing was rigid. Now we have places where patients can go if there aren’t beds, and we make the time to discuss patient needs. We always put patient safety first.”

Empowering staff

Hall says the most effective way to create change is to empower staff. “Make them part of decisions,” she says. The process changes at LVHN were a team effort. “We all worked together to do it.”

Collaboration and creative thinking hold down the number of OR holds

Beth Hall, BSN, RN, CPAN, postoperative patient care manager at Lehigh Valley, credits the success to the team’s attitude of “being open and flexible, and thinking outside the box.”

One of the first steps LVHN took was to create a value stream mapping team, which developed and completed more than 30 process improvement projects. Value stream mapping is a Lean tool used to analyze the flow of specific processes. Creating a map involves identifying the process; drawing a map showing every step of the process, including delay points; analyzing the map to identify areas of improvement and areas where waste can be eliminated; drawing the desired process; and implementing change.

Using a large piece of paper such as butcher paper and putting it on a wall where everyone can see it is 1 technique. Adhesive notes, color coding information, and drawing arrows to show flow are all helpful. Software tools can also be used. The LVHN team included a Lean coach, staff nurses, unlicensed staff, and patient care managers, among others.

“During value stream mapping, we identified the whole flow process,” Hall says. “When you see on paper what you are doing, it’s easier to ask why you are doing something that way and to ask if it’s because it’s the best process or because you always did it that way.”

This detailed analysis led the team to take several key steps to reducing holds.

Using an alternative recovery area

LVHN performs about 50 to 70 cases a day, and sometimes the 23 bays of the postanesthesia care unit (PACU) were full, halting progress in the OR. The PACU turned to its holding area for help. The 7-bed area serves as a place where preoperative blocks can be administered, so all the nurses who work there are trained in critical care. This expertise made the location a natural fit for using some beds as an alternative Phase I recovery area. “We cross-trained staff so they can float to all 3 areas: PACU, the holding area, and the alternative Phase I recovery area,” Hall says. Staff, including the 3-nurse perianesthesia float pool, spent time in each location so they would feel comfortable caring for patients in all the settings in the PACU continuum. Staff can then be relocated throughout the day to meet changing needs.

Creating a medical-surgical overflow area

Hall says the team also “took a 4-bed area and converted it into a med-surg area for patient overflow.” Patients who are ready to be treated by a medical-surgical nurse are placed in this area. “This area is not an operating room. The nurse is a medical-surgical nurse who takes care of the patients in this area. The nurse doesn’t get an OR hold,” Hall says. The area is located next to the PACU and has a television. Most importantly, family can stay with the patients. The area is located next to the PACU for easy access.

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“We cross-trained staff so they can float to all 3 areas: PACU, the holding area, and the alternative Phase I recovery area,” Hall says. Staff, including the 3-nurse perianesthesia float pool, spent time in each location so they would feel comfortable caring for patients in all the settings in the PACU continuum. Staff can then be relocated throughout the day to meet changing needs.

Creating a medical-surgical overflow area

Hall says the team also “took a 4-bed area and converted it into a med-surg area for patient overflow.” Patients who are ready to be transferred to a unit but don’t have a bed assignment are cared for by a medical-surgical nurse in the overflow area. “The nurse starts their medication, gives them pain medication, and does everything that’s needed, just like they were in their med-surg room,” she says, adding that a full-time medical-surgical nurse was hired to staff the area. The small individual rooms have walls, and each room has a television. Most importantly, family can stay with the patients. The area is located next to the PACU for easy access.

Holding multiple huddles

The team at LVHN has developed huddles into an art form. “Huddles are no longer than 5 minutes,” Hall says. “You don’t want to drag them out.”

Four huddles are held daily. The preoperative patient care manager, certified registered nurse anesthetist (CRNA), anesthesiologist assigned to the PACU, OR manager, and specialty OR managers attend the first huddle of the day, held at 6:30 am in the OR. The team reviews the cases for the day, verifying information such as whether equipment is available.

The second huddle is a “bed huddle,” held at 10:30 am with directors and patient care managers from the entire hospital. “We meet in the hospital auditorium and go over patient flow,” Hall says. At 12:30 pm, a third huddle is held in the OR and includes the preoperative or postoperative care manager, CRNA or OR manager, the anesthesiologist assigned to the PACU, OR manager, and specialty managers. “They go over the schedule for the next day so they can plan ahead,” Hall says. For example, if there will be several pediatric patients early in the day, the PACU can adjust staffing so more nurses are available earlier in the day.

The final huddle, at 3:15 pm, includes the postoperative care manager, the PACU charge nurse, and the holding room charge nurse. They look at the next day’s needs and adjust if necessary. Hall says huddles have had the most impact in reducing holds. “Before huddles, we weren’t proactive in planning and our staffing was rigid. Now we have places where patients can go if there aren’t beds, and we make the time to discuss patient needs. We always put patient safety first.”

Empowering staff

Hall says the most effective way to create change is to empower staff. “Make them part of decisions,” she says. The process changes at LVHN were a team effort. “We all worked together to do it.”

Cynthia Saver, MS, RN, is president of CLS Development, Inc, Columbia, Maryland, which provides editorial services to healthcare publications.

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This article originally appeared in OR Manager, January 2014;30:17, 26.
Using Lean strategies to improve operating room efficiency

Improvements in first case on-time starts and turnover time at Lancaster General Hospital in Lancaster, Pennsylvania, attest to the success of using Lean strategies. Within an 8-month period, first-case on-time starts (FCOTS) jumped from 35% to 72%, and the monthly average overall turnover time (TOT) for a 7-month period was reduced by several minutes.

Previous Lean assessments at Lancaster General, a 623-bed hospital with 20 ORs, had led to improvements in OR scheduling as well as the preanesthesia clinic and the preoperative unit. Because OR staff had ongoing difficulties in sustaining any improvements to FCOTS and TOT, it was decided to apply Lean strategies to these areas as well.

Lean is an integrated set of activities focused on minimizing waste and non-value-added activities, ie, things that take time and/ or resources without direct benefit to the patient.

With the help of consultants, a multidisciplinary group of Lancaster staff participated in rapid improvement events (RIEs) to improve TOT and FCOTS within the main OR.

**Methods**

An RIE is typically a 3-day event focused on documenting the current state of a process and then developing and implementing a future state by eliminating non-value-added activities.

First, historic data were analyzed to determine baseline figures and measures of performance for FCOTS and TOT. Thus, an internal benchmark was established as a point of comparison for future state data. Spaghetti diagrams, which provide visuals of the current state’s flow, were used to document observations in the OR.

Consultants educated OR staff about the history of Lean and Lean concepts: 6S (Safety, Sort, Set, Shine, Standardize, and Sustain), 8 Wastes, closed-loop process improvement, value stream mapping, value-added vs non-value-added activities, and SMART (Specific, Measureable, Aggressive yet Achievable, Relevant, and Time Bound) goals.

The team involved in process improvements, which consisted of OR nurses, preoperative RNs, surgical technologists (STs), anesthesia providers, postanesthesia care unit (PACU) RNs, nurse managers, and physicians, was told to expect progress, not perfection. After the education session, the team documented the current state, and all activities within the process were marked as value-added or non-value-added.

To establish the ideal future state, the team focused on removing waste and non-value-added activities and ensuring patient safety. The team was put into small groups to define processes and responsibilities pertaining to each role. Each individual action per role was documented on a sticky note so that steps could be rearranged, modified, or added according to what the group decided. Items needed to ensure successful implementation were added to either the “Just Do It” or the “Parking Lot” lists. “Just Do It” items could be accomplished immediately; “Parking Lot” items required acceptance and feedback from team members not present at the RIEs.

After agreeing upon and solidifying the definition of the future state, team members presented their work to the hospital’s perioperative leadership team, which then provided feedback and expressed support for the RIE teams. Following the RIE, weekly meetings were scheduled with all team members to ensure timely completion of all “to do” items. Any roadblocks were presented to the leadership team via a 4Pane, which also displayed weekly data, accomplishments, and items to be accomplished in the near future.

The main components of the future state were as follows: defined standard policies and procedures; clarified roles and responsibilities; increased accountability, staff communication, and education with regard to process changes; data-driven decisions through performance measurement; and adjusting and sustaining as needed.

**FCOTS**

First case is defined as the first case scheduled in an OR before 9:30 am. On time is defined as wheels into the room before the scheduled start time; 1 minute after the start time is considered late.

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Baseline</th>
<th>Current</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall % FCOTS</td>
<td>39%</td>
<td>70%</td>
<td>80%</td>
</tr>
<tr>
<td>Neurology</td>
<td>30%</td>
<td>65%</td>
<td>80%</td>
</tr>
<tr>
<td>Otorhinolaryngology (ENT)</td>
<td>38%</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>General (bariatrics included) &amp; vascular</td>
<td>44%</td>
<td>81%</td>
<td>80%</td>
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<tr>
<td>Plastics</td>
<td>47%</td>
<td>67%</td>
<td>80%</td>
</tr>
<tr>
<td>Dental</td>
<td>30%</td>
<td>67%</td>
<td>80%</td>
</tr>
<tr>
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<td>41%</td>
<td>77%</td>
<td>80%</td>
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</tr>
<tr>
<td>Gynecology</td>
<td>9%</td>
<td>No Cases</td>
<td>80%</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>47%</td>
<td>100%</td>
<td>80%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metrics</th>
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<tr>
<td>Overall room TOT</td>
<td>73 min</td>
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<td>56 min</td>
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<tr>
<td>Teardown time (close to wheels out)</td>
<td>12 min</td>
<td>11 min</td>
<td>9 min</td>
</tr>
<tr>
<td>Wheels out to wheels in</td>
<td>29 min</td>
<td>27 min</td>
<td>20 min</td>
</tr>
<tr>
<td>Setup time (wheels in to incision)</td>
<td>32 min</td>
<td>30 min</td>
<td>23 min</td>
</tr>
</tbody>
</table>
the 60% rate had been sustained for 12 weeks, the goal was increased to 80%.

During the RIE and for a few weeks afterward, numerous solutions were identified to improve FCOTS:

- A patient care completion matrix was developed prescribing exactly when critical patient care elements must be completed and by whom, with a deadline of no later than 15 minutes before scheduled surgery time.
- Colored flags were placed outside of all preoperative rooms to alert team members and providers where the patient was in the preparation process.
- It was decided to have the certified registered nurse anesthetist (CRNA) greet and interview the patient with the circulating RN in the preoperative unit. Additionally, the CRNA could premedicate the patient without a physician order if necessary.
- An SBAR (Situation Background Assessment Recommendation) tool was developed that combined both anesthesia and nursing requirements for a safe handoff throughout the perioperative experience.
- All ORs were damp-dusted and stocked, and computers were to be booted up by the night shift starting at 4:00 am.
- All OR staff were expected to begin opening packs and scrubbing 15 minutes before the scheduled case start.
- A daily after-action review huddle was set up to take place 15 minutes after cases start in the OR so that preoperative and OR leaders can discuss what went well or what did not go well and requires further action.
- A daily afternoon huddle was instituted to plan for the next day’s cases. Leadership from the preoperative unit, OR, PACU, sterile processing department, and OR scheduling meet every afternoon to mitigate any issues.

**TOT**

Traditional TOT is defined as wheels out to wheels in of the next patient. However, the team decided to target TOT from the surgeon’s perspective, which is close-to-incision. That time period was broken down into teardown time, wheels in to wheels out, and setup time, adding up to overall TOT.

The overall TOT from 11 months of baseline data was 73 minutes. The goal was to reduce that metric by 30%, or reduce down to 56 minutes.

The TOT event was held a month after the FCOTS event. The team also had to determine how the OR would function under a new surgical technologist (ST) staffing model. Historically, 2 scrub technicians had been assigned to each OR, but to increase efficiency, the future model had 1 ST assigned to each room and a second scrub technician or ST first assistant assigned for cases requiring additional support.

The following solutions for improving TOT were identified during the event:

- A new pod staffing model was devised in which 3 to 4 like specialty rooms comprise a pod with dedicated support staff assigned to each pod. Additional float staff are assigned to pods based on the surgical case type.
- A new surgical support aide (SSA) role was established with clearly defined and expanded responsibilities for before, during, and after surgical cases.
- Walkie talksies replaced overhead paging or passive phone communication, allowing immediate response.
• Job completion matrices were developed for basic and complex case turnovers. The matrix for each defines the expectations of who should be doing the work, when it should start, and when it should be accomplished.

• A 6S project was completed in the surgical equipment room. Baseline, current (7/15/13 to 7/19/13), and goal values for each FCOTS and TOT metric being tracked are shown in the table.

Results

Adoption of Lean strategies has transformed the daily operations of the hospital’s surgical units. The increased level of engagement among staff, administration, and physician partners has allowed for tremendous improvements in FCOTS and TOT. For accurate and timely data retrieval, a comprehensive database was built that included all the key time periods during a surgical encounter. Each perioperative leader was responsible for reviewing and reporting weekly variances from set goals as well as action plans associated with those variances.

The two graphs show monthly improvements in FCOTS from November 2012 through June 2013 and improvements in TOT from December 2012 through June 2013.

Based on the average number of OR minutes saved, the annual opportunity revenue for additional capacity for the 15 ORs is $2,338,245. Financial benefits have yet to be realized from this project; however, some high-performing surgical teams—namely bariatric—have been able to complete an increased number of cases within the normal block time. This is the first of many wins to come for Lancaster General Hospital.

Trish L. Stoutzenberger, ST, CRCST, CHL is with Lancaster General Hospital. Colleagues involved in this project included Samantha A. Kimer, BSN, RN, and Brenda L. Ulrich, MSN, MHA, RN, CNOR, also with Lancaster General Hospital, as well as Ian D’Silva, MS, director of performance excellence, and Mitesh Shah, MBA, project manager, with Owens & Minor, a medical and surgical supply company headquartered in Richmond, Virginia.

This article originally appeared in OR Manager, January 2014;30:18-20.
Safer Surgery: Six steps that aim for excellence in sterile processing

It’s axiomatic that sterile processing is critical to safe and effective surgical care. The sterile processing department (SPD) is like an “engine room” for the OR, where the staff produce the sterile instruments and other equipment needed for surgical cases.

An OR with a volume of 75 cases a day can require upwards of 50,000 individual instruments, many with complex and intricate parts. Any flaw in cleaning and reprocessing is a potential threat to patients. It’s a demanding job, and one that is often unsung. Surgical departments striving for safer care include sterile processing as colleagues and allies.

OR Manager interviewed 4 SPD leaders about their efforts to build bridges with their surgical colleagues, embrace continuous improvement, and focus on customer service. These are their suggestions for achieving excellence in sterile processing.

One: ‘Heart of patient care’
These SPD managers make sure their staffs know the essential role they play in patient care.

Rudy Gonzales, MSN, RN, CNOR, CRCST, CHL, has led his department at the Louisiana State University Health Science Center in New Orleans in recovering from the complete destruction of the SPD at the former Charity and University Hospitals after Hurricane Katrina. He’s participating in the building of a new replacement University Medical Center to open in 2015.

Gonzales says he tells his staff: “The doctors can cure disease, the nurses can care for the patients, but if they don’t have the right equipment, they can’t do their jobs effectively. We never want to have something we’ve done to affect the patient.”

Sue Klacik, BS, CRCST, FCS, who manages central sterile (CS) services at St Elizabeth Hospital, a 350-bed Level 1 trauma center in Youngstown, Ohio, conveys the same message: “My staff know they are every bit as important as the team in surgery.”

She makes sure the staff are empowered. “If at 2 am, they see something that doesn’t look right for a case the next day, they contact surgery to see if there’s a problem and discuss a way to resolve the issue.”

Valuing the staff carries through to compensation. These leaders make sure their staff’s pay is competitive with that of other area hospitals.

Two: Stay in touch with the OR’s needs
Visibility and customer service are leading strategies these leaders employ to make sure they’re meeting the OR’s needs.

Keep communication open
“I’ve learned over the years that if you don’t want to hear from the OR, they will lose trust in you because you are not addressing the issues,” says Mark Duro, CRCST, FCS, manager of the Central Sterile Processing Department at New England Baptist Hospital in Boston, a leading orthopedic center performing 25 to 30 joint replacements a day.

When there is an issue in the OR, depending on how serious it is, Duro goes directly to the room. Less critical issues are reported on a communication sheet that records the date, time, personnel involved, the issue, suggestions for possible solutions, and a signature. Duro reviews the sheets once a week and addresses the issues.

Participate in daily huddles
Every day at 1:30 pm, Klacik or a CS coordinator joins a huddle in the OR to review the next day’s schedule and determine needs. At 3 pm, she huddles with the CS staff.

“We talk about what’s happening tomorrow,” she says. “We discuss which trays to watch for. If loaner trays aren’t in, we start calling the vendor.”

If necessary, she adjusts staffing to meet the requirements of the next day’s surgical schedule.

Round in the OR
Klacik and CS coordinators round in the surgery department throughout the day. “If surgery has a question or comment, they can stop and tell us,” she says. “They know we are accessible, and we can nip problems in the bud.”

Attend OR staff meetings
Duro attends OR staff meetings to share information. At one point, the OR was reporting holes in sterilization wrappers. An OR staff member asked, “Why not use containers?” Duro had a chance to explain that many instrument sets have not been validated by the device manufacturer for the use of sterilization containers.

“We have to follow the manufacturer’s instructions for use (IFU) for everything—not just the equipment but also the packaging material,” he told them, noting that failure to follow the IFU can incur liability.

Three: Educate, educate
Education of CS techs is the backbone of a safe, efficient sterile processing program. Klacik emphasizes.

“I can’t stress how important education is in this job,” she says. With today’s demands, “techs need to be technically trained and to have critical-thinking skills.”

Klacik, an approved CRCST instructor, also serves as the educator for the department. “We teach the standards and recommended practices, along with the rationale behind them,” she says. She also provides in-service education on all new equipment, including the IFU.

At St Elizabeth, certification of CS techs is a condition of employment. Klacik teaches the classes herself. The hospital purchases the books, and education is conducted on work time.
Four: Provide the right working conditions
Klacik ensures the SPD staff have the proper equipment and work environment to do their jobs well.

“At our work stations, we have the correct conditions—the right lighting, equipment like magnifying glasses, quality monitors, and other tools,” she says.

IFUs are available on PCs throughout the department, which provide access to onesourcedocs.com, an online database of manufacturers’ instructions.

At New England Baptist, sterile processing is almost completely automated. In planning the department, which opened 3 years ago, Duro and his team scoured the US and Europe for the latest in technology.

Five: Support the staff and hold them accountable
Accountability goes hand in hand with education.

“If someone has made an error, we bring it to their attention so the error doesn’t occur again,” Klacik says. “They know what they do affects patient are, and they are meticulous.”

Gonzales, who now has a master’s, relies on the bedrock values he learned in the Army: “Make sure your staff have what they need to do the job, make sure they’re trained, and make sure their pay is correct. Then most things will work out.”

Six: Foster continuous improvement
At Virginia Mason Medical Center in Seattle, which has pioneered Lean management in health care, the director of sterile processing, Sam Luker, MBA, CRCST, and his team have a constant focus on eliminating waste and mistake-proofing sterile processing. Every day begins with a daily “newspaper” reporting on defects that reached the OR the previous day. Encouraged by a Japanese sensei, the department recently began working on a process to create just-in-time instrument sets built to order for surgeons performing the next day’s cases.

—Pat Patterson

This article originally appeared in OR Manager, April 2013;29:1, 6-7.
A ‘cockpit checklist’ reduces defects in instrument sets

Checklists are a common safety strategy in the OR. Why not have a checklist for the sterile processing department (SPD)? A “cockpit checklist” has helped reduce defects in instrument sets at Virginia Mason Medical Center in Seattle, Washington, by serving as the final quality assurance audit before a set enters the sterilizer.

The checklist was introduced after packaging mistakes were found to be the most common type of defect in sets reaching the OR.

At Virginia Mason, a mecca for Lean management in health care, the search for and correction of defects is relentless. The hospital has wholeheartedly adopted the Toyota Production System pioneered by the Japanese.

Like all departments, sterile processing regularly engages in Lean activities such as kaizen (continuous improvement) events and rapid process improvement workshops (RPIWs) to mistake-proof processes and eliminate waste.

Checking the ‘newspaper’

Every morning when the director of sterile processing, Sam Luker, MBA, CRCST, and his leadership team arrive for work, they check the “newspaper,” the defect status report from the previous day. A defect is any flaw in a sterile instrument set discovered in the OR. The defect rate is the number of defects divided by the number of cases.

“When we discover a defect, we analyze the data, initiate mistake-proofing protocols, and solicit Everyday Lean Ideas (ELIs) from our front-line operators, so we can quickly correct the problem,” he says.

The cockpit checklist, he adds, “is probably the most effective mistake-proofing strategy we’ve implemented so far.”

After the checklist was introduced, the defect rate for set packaging fell from 3% a few years ago to 0.12% in December 2012. That’s just 2 packaging defects for the 1,552 cases the ORs performed that month, which used approximately 20,409 sets.

Among packaging defects the checklist catches are missing locks and chemical indicators, loose filters and retention plates, and mislabeled sets.


He says, “We immediately planned a 5-day RPIW on defect reduction for surgical instrument sets where front-line operators and leaders worked together to develop and refine the cockpit checklist.”

How the checklist works

After a set is assembled but before it is containerized, the set is placed on a staging cart at the “cockpit check station.” There a sterile processing tech reviews the checklist to verify items such as the chemical indicator, filter, and correct label (sidebar).

After all items are verified, the set is containerized and placed on the cart to go into the sterilizer.

The checklist project is reported in the March 2013 Joint Commission Journal on Quality and Patient Safety.

Building trust with the OR

The checklist is just one of the strategies Luker and his team have employed to improve customer service with the OR. Others include:

Barcoding

Every instrument set is barcoded, as are some instruments critical to a set, such as the carpal tunnel release instrument from the set for that procedure.

“The system won’t let the tech complete the set until that item is scanned, showing it is present,” Luker notes.

Rapid response line

The OR can call the SPD’s rapid response (RR) line during a case to report a defect, such as a dirty suction in an ENT set. A sterile processing leader is dispatched to the OR immediately.

“It’s always about customer service,” Luker says. “We want to make sure the OR gets to interact with our team member and that we get the documentation we need for analysis and accountability.”

At times, the situation can be resolved on the spot. In a recent example, the OR called the RR line when a surgeon found an instrument wasn’t functioning as expected. When Luker went to the OR, he discovered the surgeon was using a delicate laparoscopic instrument to try to grasp a tube, which the instrument wasn’t designed to do. The surgeon was provided with the correct instrument.

The information about the defect is brought back to the SPD, posted on the status board, and reported to the team so the defect can be addressed in real time.
Visibility board

The daily status report is used to update a poster-sized monthly “visibility board” complete with pink stickers to highlight the defects and the categories in which they are occurring (image). A color-coded dot indicates the process in which the defect occurred and the level of seriousness based on risk assessment. For example, a red dot indicates potential for major harm or case delay, an orange dot indicates potential for minor harm or case delay, and a yellow dot indicates no potential for harm or case delay.

Accountability for SPD staff

If the defect involves an SPD tech, the supervisor meets with the tech to review the incident, discuss contributing factors, and assess any education and training opportunities. The department educator is involved if education/training needs are identified. The conversation is documented using an online “important conversations” form. To close the loop, copies are submitted to the SPD director, manager, supervisor, educator, quality assurance coordinator, and the tech.

Sushi, anyone?

Consistent with Virginia Mason’s Lean culture, the SPD holds regular continuous improvement events. Japanese sensei (Lean masters or teachers) visit hospital departments to counsel them on improvements.

“Instrument sets should be like sushi, made just in time, not put on the shelf to sit for a year,” one sensei recently challenged. Says Luker, “We thought that made sense. We have hundreds of ‘sleeping sets’ that sit idle in our storage area. That is an inefficient use of space and inventory.

“If we can build sets to order—say, give Dr Smith just the instruments needed to perform that particular procedure scheduled—we could reduce what we have to reprocess and store as well as the number of instruments we purchase.”

Just-in-time sets

When interviewed, Luker and his team were preparing for a 5-day 3P (production preparation process) workshop. In industry, a 3P focuses on new product development. In this case, the

“product” is instrument sets, specifically just-in-time sets. The workshop included 5 front-line SPD techs, each tied up for 40 hours. How can the department free up that much staff?

“Our culture and our leaders are totally committed to Lean,” Luker responds. That includes supporting him by allowing overtime and use of per-diem personnel during these projects.

“Front-line techs are considered essential to improvement efforts,” he notes. “They do the work all day, and as the ‘process experts,’ they generally have the best ideas for resolving issues. Our job as leaders is to draw out the best mistake-proofing ideas and facilitate their implementation.”

—Pat Patterson

Reference


This article originally appeared in OR Manager, April 2013;29:8-9, 11.
Lean management and automation have come together to create a sterile processing department (SPD) that can efficiently process the 700 to 1,000 instrument sets a day needed to support a case-load that is primarily orthopedic.

The SPD at New England Baptist Hospital in Boston is one of the few in the US to be fully automated. The hospital performs 15,000 surgical cases a year, with 80% of those in orthopedics.

Because of the department’s capacity and efficiency, an entire total hip or knee setup can be turned around and back to the OR in 3 1/2 to 4 1/2 hours, says Mark Duro, CRCST, FCS, manager of the Central Sterile Processing Department.

“We’ve removed the human element from many of our functions, but we still have safeguards,” Duro says.

**Harnessing technology**

Duro, who has a keen interest in automation, says he’s always on the lookout for technology that would cut waste and streamline the department’s operations. That was particularly true during a complete renovation 3 years ago. With 20 years of experience in sterile processing, he helped lead the team that planned the new department, researching automated systems and going on site visits.

Because of the automation, the workflow is different than in traditional SPDs, Duro explains. Each tech builds a sterilizer load at his or her workstation. “Our techs don’t move. Everyone is assembling kits.

“The only time they leave is to push a whole cart of trays over to the sterilization area,” he notes.

There, the assigned tech scans the trays on the cart and parks the cart in front of the sterilizer, where it is pulled in automatically after being identified by a photo sensor. After the cycle is finished, the cart is automatically ejected into the storage area where techs put the sets away.

Here are features of the automated system.

**An automated SPD**

The department is organized in 3 zones—decontamination, prep and pack, and sterilization—as recommended by the Association for the Advancement of Medical Instrumentation (AAMI).

- To avoid cross-contamination, only a pass-through window—but no door—connects the decontamination area with the clean areas.

- The instrument tracking system is also integrated with the sterilizers and with the biological indicator (BI) incubator. If any parameter falls outside the prescribed limits, the system stops and doesn’t proceed until the problem is resolved. An example is a set that requires an extended cycle has an unusual parameter.

- A bank of lights signals when action is needed, saving phone calls and interruptions. A red light flashes when the elevator arrives from the OR. A blue light means the cart washer is ready to be unloaded. A green light means a sterilizer has automatically unloaded. The lights are triggered by photo sensors.

- All instrument sets are barcoded. To document which sets are in a load, all of the sets are scanned before they go into the sterilizer—no handwritten documentation is required.

- Sterilizers are on an automated pass-through. When a cart of sets is parked in front of the sterilizer, the tracking system signals the sterilizer. A door to the sterilizer pass-through automatically opens, the cart is pulled in, and the cycle starts. At the end of the cycle, the cart is unloaded automatically, tripping another photo sensor that triggers the green signal light.

- The sterilizers, once permission is given, connect to the instrument tracking system and report the load’s parameters. The BI incubator, also integrated with the tracking system, prompts the staff to gather the appropriate data from the BI.

“If any of our systems, such as a washer or sterilizer, don’t meet the parameters, the system does not allow the process to go forward,” Duro says. If a sterilizer’s temperature drops from the intended 270ºF to 269.9ºF, for example, the system will only let the cart go back into the processing area; it will not go forward into storage.

**Getting the resources**

Duro believes the hospital’s investment in automation for sterile processing reflects its view that the department is essential for safe care.

“To make sure we are doing the best job possible and to make sure our surgeons have the best tools they can have, it’s almost a slam dunk to see that everything starts with processing,” he says.

—**Pat Patterson**

*This article originally appeared in OR Manager, April 2013;29:10-11.*