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 hip patient. The CRNA puts music headphones on the patient and administers minimal sedation. The surgical team completes patient positioning and prepping, and the case proceeds.

After the first case, the circulating nurse takes the patient to the postanesthesia care unit (PACU), goes directly to the SSAP or SSA to interview the next patient, and then goes to the OR to assist with opening supplies and room setup.

While the circulating nurse is doing this, the surgeon is already working in the second room.

When instructed by the surgeon, the room 2 circulating nurse calls and tells the room 1 circulator and the CRNA to go for the third patient.

“The 2 rooms work hand-in-hand like this for all of the patients scheduled for the surgeon,” notes Wittner.
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 postop day 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 from previously waiting 6 hours after the epidural catheter was removed to discontinue the Foley,” says Gross. “Through the use of evidence-based research, we were unable to find literature that would support keeping the Foley in place,” she says.

Earlier catheter removal has helped to shorten length of stay 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.

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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