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INSIDE

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While Preparing for COVID-19 Spikes, Influenza Season, Prioritize Supply Chain Management

The 2020-2021 winter period could be a particularly challenging time because of the ongoing COVID-19 pandemic and the emergence of influenza.

When the COVID-19 crisis first struck the United States, healthcare facilities faced unprecedented disruptions, including the suspension of elective surgeries, partly because of personal protective equipment (PPE) shortages nationwide. The healthcare industry is better prepared today to handle the crisis, but individual facilities still face obstacles.

"Even large hospital chains were unprepared for this type of disruption in the supply chain. It's created an opportunity for people to become aware of where they get their [PPE] from and know what alternatives are available and how to access them," says **Gail Horvath**, MSN, RN, CNOR, CRCST, senior patient safety analyst for ECRI.

Although the healthcare industry has become accustomed to supply chain disruptions, especially with pharmaceutical supplies, the COVID-19 pandemic has exacerbated the problem, says **Bruce Hall**, MD, PhD, MBA, FACS, vice president and chief quality officer for BJC HealthCare.

One of the top reasons elective surgeries were suspended nationwide in March and April was because the United States was not prepared with an adequate PPE supply, says **Chaun Powell**, MBA, group vice president of strategic supplier engagement for Premier Inc.

"We didn't have adequate protection for patients and caregivers, [such as] N95s," he explains. "If we had ample supply, my feeling is we probably could have continued with elective procedures. It wasn't the only factor, but absolutely was one of the lead indicators."

Use of N95 masks escalated rapidly during the pandemic, but the supply chain could not keep up with global demand. "Look at the overall global surge and demand [from the pandemic]

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to the demand you might see in response to [the terrorist attacks of] 9/11 or to a hurricane, and we are looking at a net large, global surge in demand," Powell explains. "We were hit hard in the spring and summer with COVID, and we realize the potential impact in the fall with flu season. We didn't take time to rectify the gaps in the global healthcare supply chain."

For instance, many local and state governments mandated hospitals to stockpile PPE, which further stressed the supply chain. "You were taking masks out of circulation in order to put them on a shelf to meet future use expectation," Powell says. "This means you have some caregivers competing to use those masks vs. those competing to put them on a shelf to meet the requirements put in place by local or state agencies."

One of the stranger parts of this supply chain disruption was how unimaginable products suddenly were scarce. "Face masks are not difficult or expensive to produce, but because of interdependencies of different pieces of supply chains, things like face masks were threatened," Hall explains. "It shocked us that organizations were buying products in larger quantities because they were afraid they'd never have another chance to buy more."

The COVID-19 crisis revealed the fragility of the supply chain. "We never thought we'd have trouble getting disinfectant wipes," Hall offers.

Supply pressures led to wild price fluctuations. For example, N95 masks, which sold for as little as $1 each before COVID-19, suddenly sold for six times the usual price.[1] New York state paid more than four times the usual cost for gloves, 15 times the usual cost for masks, exorbitant prices for X-ray machines, and twice the usual rate for infusion pumps.[2]

Two driving factors were the industry's reliance on efficient and just-in-time inventories and the lack of a cohesive national policy in handling the need for critical PPE and other items during the first COVID-19 surge.

"Organizations, due to financial constraints, have moved to virtual inventories or just-in-time inventories, and they keep minimal items on hand," Horvath explains. "That works wonderfully in normal times, but not when you have supply chain disruption."

The pandemic laid bare the true dependencies of the world's interdependent supply chain. "Supply chains were disrupted at a really high level. Then, in the United

EXECUTIVE SUMMARY

As surgery centers brace for the emergence of influenza season and another possible spike in COVID-19 cases, one major focus should be on managing the supply chain in the event of further disruptions.

- Shortages of personal protective equipment were a major reason why the nation paused elective surgeries earlier this year.
- Stockpile mandates from local and state governments further stressed the supply chain.
- Supply pressure led to wild price fluctuations, including N95 respirator masks selling for exorbitant prices.

States, there was not a unified federal response," Hall observes. "What we had was 1,000 local responses and organizations battling with each other, and that made the market harder to deal with and harder to understand."

In some cases, healthcare organizations competed with the federal government to procure necessary supplies. One physician executive reported how his hospital had to pay five times the usual cost for three-ply face masks and KN95 respirators, which are N95 respirators made in China. Before the hospital transferred payment, the FBI arrived to investigate the transaction.

Agents allowed the hospital to load the supplies, which staff disguised by putting in food service vehicles. Trucks were sent on different routes to prevent federal officials from seizing or redirecting the supplies.

"Only some quick calls leading to intervention by our congressional representative prevented its seizure," the executive wrote. "When encountering the severe constraints that attend this pandemic, we must leave no stone unturned to give our healthcare teams and our patients a fighting chance. This is the unfortunate reality we face in the time of COVID-19."[3]

A small medical equipment supplier was not so lucky. The supplier ordered 1 million N95 respirators, and tried to sell to his regular customers, including nursing homes. However, the FBI intervened, accusing the supplier of price gouging. The supplier countered those accusations, arguing he was selling those respirators at razor-thin margins. After weeks of waiting to distribute these supplies, FEMA told the supplier the agency was seizing the material.[4]

"Supply chains reaching into China were disrupted for both medical reasons and also because of political reasons," Hall says. "Different governments changed rules about transportation and clearance of goods."

The PPE supply improved as the pandemic continued through the summer and into the fall, says **Scott Jackson**, executive director of Henry Schein Surgical Solutions of Melville, NY.

"Manufacturers and distributors of PPE supplies have been working tirelessly to fill as much of the demand as possible, but some challenges still exist," Jackson says. "However, the supply of PPE is less stressed today than it was during the peak COVID months."

Face covering shortages have received plenty of attention, but there were other disruptions associated with IV fluids and a handful of drugs, including propofol.

"Fortunately, these disruptions are mostly under control," Jackson reports.

A virus resurgence could disrupt the supply chain again, so surgery centers should prepare accordingly. "We, within the supply chain, also need to learn from these disruptions and make continual improvements to help prevent future disruptions," Jackson adds. ■

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The State of the Supply Chain

Researchers and executives say the United States' supply of PPE is much better now than it was in March 2020, when the COVID-19 pandemic started, but problems remain.

For example, ECRI analyzed imported KN95 masks. They found up to 70% of these devices do not meet U.S. standards for effectiveness, suggesting future supply demands could be affected this winter.[1] Despite more domestic production of N95 masks, health systems continue to report widespread shortages, causing providers to rely on imported KN95 masks from several manufacturers that were newly registered in China.

The American Medical Association (AMA) sent a letter to FEMA, expressing concern about the availability of PPE for clinicians in office-based settings. "Strains on the supply chain for PPE and disinfectant products continue, and they simply are not available from the usual sources for physician's use," the letter reads.[2]

The letter implores FEMA to work with the AMA to provide additional assistance to healthcare providers in securing PPE and to collect and disseminate supply chain information

to address concerns. *(Editor's Note:* Same-Day Surgery *requested an update from the AMA on whether FEMA had responded to any of the organization's concerns and suggestions. Through a spokesman, the AMA declined to comment further on this issue.)*

Medical products that continue to be in high demand but low in supply include shoe covers, isolation gowns, and bouffant caps, among others.[3] Surgery centers should create a pandemic plan that addresses their entire supply chain, says **Scott Jackson**, executive director of Henry Schein Surgical Solutions of Melville, NY.

"Ambulatory surgery centers [ASCs] should speak with supplier partners and other ASC leaders to gain new ideas," he offers.

Before the COVID-19 pandemic, the U.S. healthcare industry did not clearly understand the origins of raw products that combine to make PPE, says **Chaun Powell**, MBA, group vice president of strategic supplier engagement for Premier Inc.

"A tsunami might not have an impact on the supply chain if there are 10 different [supply] locations across the globe," Powell says. "But we were heavily reliant on a concentrated geography for several different products, including the raw material used in masks."

Specifically, there are plenty of raw products needed for certain PPE that originate in China. But they were the first to deal with COVID-19, which disrupted China's industrial production patterns, causing a ripple effect.

The pandemic has revealed just how fragile and interconnected the global supply chain is — and in ways many may not even recognize. Consider isopropyl alcohol wipes, which remain in short supply. Why? Thousands of items, including rubbing alcohol antiseptic, hand sanitizer, and drugs, contain isopropyl alcohol, which is a byproduct of fuel production.

"In that regard, shutting down [travel] produced more supply scarcity," Powell notes. "We are in a decent place with isopropyl production, but there is less supply than we would like to see in the industry today." ■

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How Surgery Centers Can Weather the Next Supply Chain Disruption

Even small, independent surgery centers can survive a major supply chain disruption by making important changes now, before a possible resurgence of COVID-19 cases (or other natural disasters) affects the supply chain.

The first step is to expect a disruption. The COVID-19 pandemic will not be the last time there is a supply chain disruption, says **Gail Horvath**, MSN, RN, CNOR, CRCST, senior patient safety analyst for ECRI.

EXECUTIVE SUMMARY

Surgery centers can survive coming supply chain disruptions if they take proactive measures to improve their supply chain management.

- The supply manager should know their supply chain's risks and vulnerabilities, including the locations of manufacturers and suppliers.
- With local partners, surgery centers could achieve purchasing power and develop a more resilient supply chain.
- For all essential items, there should be a back-up plan in case one supplier falls through during a crisis.

Supply chains rely so much on national and international transportation that even a major incident on the West Coast can cause a medical supply disruption on the East Coast. For example, Horvath recalls when snow storms prevented planes from taking off with orthopedic supplies, and ground transportation was stalled, too.

"I can remember as an operating room nurse when we'd run out of orthopedic screws, could not replace them in a timely manner, and had to postpone surgeries," Horvath says.

"The nature of this business is that if another crisis rolls around the country, new items might be threatened or more critical drugs are threatened," says **Bruce Hall**, MD,

PhD, MBA, FACS, vice president and chief quality officer for BJC HealthCare. "The next time there's a crisis, it might be different and not be about face masks. Even though we're in a good place now with face masks, we have to deal with structures to help us deal with the unexpected."

Every surgery center's emergency preparedness plans should be updated to include pandemic preparedness, with a section that addresses all critical supplies, and not just personal protective equipment (PPE), says **Scott Jackson**, executive director of Henry Schein.

One best practice is to appoint and empower someone who is passionate about what they do to manage the supply chain. Also, surgery centers could invest in a materials management system that is tailored for their operations. Finally, leaders could put policies and procedures in place to use the chosen technology that helps with supply chain management.

Horvath, Jackson, and Hall offer more suggestions on how to improve supply chain management and how to be prepared in the event of a disruption:

• **Stay current on the newest guidelines.** Ambulatory surgery centers (ASCs) should stay abreast of guidelines related to PPE that are issued by associations that represent the specialties a center provides.

"For example, there may be new guidelines for GI that are different than those issued for orthopedics," Jackson offers.

• **Learn your supply chain's risks and vulnerabilities.** At a minimum, the person managing the supply chain should know the manufacturers, where they are located, how the items are shipped, and where they are warehoused. "If a tsunami hits Southeast Asia, [the supply chain manager] should know which necessary supplies are going to be difficult to obtain," Horvath says. "They need to have a backup plan in place."

For example, Puerto Rico is home to dozens of medical manufacturers. When a hurricane destroyed much of the island's infrastructure in 2017, manufacturers could not ship supplies. This affected healthcare organizations across the United States, leading to shortages of basic supplies like IV fluids.

Supply managers also should consider the kind of disruptions that most people do not imagine, such as labor strikes at docks or factories that could keep supplies stuck in limbo. Similarly, embargoes are another disruption over which healthcare organizations have no control.

In addition to geographic and shipping factors, surgery center supply managers need to know their suppliers' total capacity, financial stability, track record for dealing with problems, and their facility's own relationship with that manufacturer or supplier.

• **Partner with others to ramp up scale.** Surgery centers should look for local partners with whom they could team to achieve some scale in developing a more resilient supply chain.

By joining forces, facilities can gain expertise from other organizations' experience, and they can work together in negotiating with distributors and manufacturers.

"It's not merging, just a local/regional partnership that is formed to bring some brain power together," Hall notes.

• **Develop a few backup plans.** There usually are situations when a surgery center will deal with one supplier to obtain the best price. This could be for commodity items, such as gauze. "You might choose to deal with one supplier for the sake of good contracting and the relationship," Hall explains. "There are many other options if that supplier falls through."

But in the case of complex supplies, surgery centers should not rely on one supplier. They need to build relationships with two or three suppliers that could find those items if the main supplier experiences a disruption.

• **Use variation.** Surgery centers should include in their inventory

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some items that are available in both nondisposable and disposable forms, such as gowns.

"If the disposables supply is threatened, you can reuse [nondisposables] a little more," Hall suggests.

• **Stockpile more than before — with prudence.** The pandemic put a glaring light on the flaws of the just-in-time inventory system. Many healthcare organizations are responding by building stockpiles of certain critical items. "That costs money and efficiency, but we need those safety margins back," Hall explains.

Organizations also can take longer-term contracts on key items, such as face masks. "We normally wouldn't have taken a two-year-long commitment to buy masks in high quantities," Hall adds. A drawback of stockpiles is waste. For example, Horvath recalls that when the pandemic began, a large health organization owned a bountiful stockpile of N95 masks. That would have been fortuitous, except the masks had been in storage for so long they were dry-rotted and had to be discarded.

"Even if you have to stockpile, you need to check on them frequently and replace them as needed," Horvath stresses. ■

Staff Can Help Keep Supply Costs Low

Surgery center staff can help save surgery centers thousands of dollars in supply costs. They also can find ways to prevent shortages from disrupting operations.

Supplies are the second-largest expense for ambulatory surgery centers (ASCs), according to **Scott Jackson**, executive director of Henry Schein.

"Supplies can easily consume 25% of a center's entire yearly budget," he reports. "This number is likely to increase as a center begins to perform more device-intensive procedures, such as spine, total joints, and cardiac procedures."

• **Train staff to be sensible with supplies.** Surgery centers should take every conservation measure they can to prevent unnecessary consumption of personal protective equipment (PPE), says **Chaun Powell**, MBA, group vice president of strategic supplier engagement for Premier Inc.

"They need to make sure they're best prepared should there be an additional flare-up in the fall," Powell adds.

Staff can waste supplies, notes **Gail Horvath**, MSN, RN, CNOR, CRCST, senior patient safety analyst at ECRI. For instance, some staff will throw away unused half sheets when they could have been saved for future use in draping patients.

"I had nurses open four half sheets when they only needed one," Horvath says. "I had them bag everything open to the field that they didn't use. The amount of money going into the trash was astronomical."

Horvath made a presentation showing this waste. One nurse said, "I didn't realize we were a business. I came in to this to help people." Horvath asked the nurse to imagine what would happen if too much of the budget went to supplies, which might lead to the nurse not receiving her next paycheck.

"She said, 'I would quit,' and I said, 'See, it is a business to you,' and she became one of my best managers," Horvath recalls.

Framing the problem this way, in terms the staff can understand, will hammer home the message. For instance, a manager could say the amount of money spent on supplies needlessly ending up in the trash could pay for sending two nurses to a conference or adding another employee to the staff.

"When you tell people this, they'll buy into it," Horvath says. "Be open and transparent with staff." Another way to secure staff buy-in is to form a custom pack committee of staff members. The committee should look for ways to spare supplies that are used infrequently. For instance, the packs might include a $15 item that is used only once in 20 procedures. Rather than include that item in each pack, meaning it would be thrown out 95% of the time, staff could place that on a shelf where it could be found when needed.

"We eliminated over $2 million a year at a health system after having a custom pack committee," Horvath reports.

• **Involve clinicians in supply management decisions.** "Make sure you have clinicians involved in your supply chain, even if they're just advisors," says **Bruce Hall**, MD, PhD, MBA, FACS, vice president and chief quality officer for BJC HealthCare. "There will be a lot of decisions facing us in the future about one product substituting for another that you need clinicians helping out."

The best supply management includes clinical cooperation with the supply team through meetings and discussions about how to make the stockpiling of supplies more efficient — but also ready for a major supply chain disruption. "We want good [financial] margins and good

safety margins, and we can't leave any pennies on the table," Hall says. "The decision-making needs to be very clinically informed, with clinicians and supply professionals working together at all times." ■

Eye Procedures Declined Dramatically During Pandemic Shutdown

The authors of a recent study found that emergent ophthalmic surgical care at one eye surgery center dropped to about 10% of its 2019 level for the same month thanks to the COVID-19 pandemic.[1]

"What was happening with surgical volumes during the pandemic? We were concerned about lack of access to surgical care people needed," says **Zubair Ansari**, MD, assistant professor and medical director of outreach, cataract, comprehensive, and global ophthalmology at Bascom Palmer Eye Institute, part of the University of Miami (FL) Health System.

When comparing data from April 2019 to data from April 2020, Ansari and colleagues found 1,107 procedures occurred in April 2019 vs. only 117 in April 2020.

They also found the type of eye surgeries performed also varied significantly. Before the COVID-19 pandemic, the investigators found cataract surgery was the top eye procedure, accounting for 47.3% of all such surgeries. In 2020, the most dominant procedure, at 31.6% of cases, was retinal detachment surgery, Ansari reports.[1] "We were one of the few institutions open during the height of the pandemic, so we found that many referrals from the emergency department were emergency cases," he says.

Lower surgery case numbers were expected because the pandemic forced many to pause elective procedures. But what happened to surgical procedure caseloads once operating rooms reopened nationwide?

"It would be interesting to look at what happened to caseloads when Florida got hit with COVID-19 in the summer," Ansari says. "This would be all anecdotal, but I think those trends, in terms of volume decrease, were not as pronounced in the summer as they were in March and April."

Heading into the fall, Ansari says the surgery center from his study was starting to rebound as the rate of COVID-19 cases began to fall in Florida. Nevertheless, he reports that some patients who delayed scheduled March and April cataract removal procedures still have not rescheduled those dates.

"We know cataracts have an effect on quality of life for patients," Ansari says. "People with cataracts in both eyes are at risk of other types of medical issues."

Surgeons should think about how they will deliver care to patients as the COVID-19 pandemic continues and how they will prepare for future crises.

"It's a challenge taking care of patients who we feel are at significant risk as a result of cataracts," Ansari says.

For example, if patients are not returning because it is challenging to schedule the appointment, then surgery centers should direct coordinators to contact patients and try to see what the center can do to fit those patients into the schedule, he suggests.

"I look through my patient logs and see which patients have significant limitation due to cataract blindness to see if we can squeeze them in earlier," Ansari says. "We do outreach presentations in the local community."

Bascom Palmer Eye Institute leaders inform citizens about

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infection control protocols and how the center screens everyone who comes in. They discuss telemedicine options for high-risk patients, and they talk about how they comply with regulations and guidelines.

"Cataract surgery, as compared to other major surgical procedures, is one of the most successful and quickest procedures you can go through," Ansari says.

Ansari and colleagues also observed other interesting trends. They found the mean age of surgeons performing eye procedures declined from April 2019 to April 2020 (48.4 years vs. 42.3 years). The same was true for the average age of patients (59 years in April 2019 vs. 50 years in April 2020).

Ansari attributes these trends to the likelihood that older surgeons and patients may have been more hesitant about working in or receiving treatment in a surgery center during a pandemic.

"We didn't gather data on nurses or technicians, but I would guess that trend would be observed in that group, as well," he adds.

As the COVID-19 crisis continues, surgery center leaders must ensure the continued well-being of not just patients, but also their staff. For Ansari, learning new information about the virus each day, along with gradual improvements in the personal protective equipment supply chain, alleviated anxiety among his staff.

It also helped when the surgery center instituted rigorous screening and testing programs. "Most of our staff were assuaged by those guidelines," Ansari says. "Still, Miami-Dade was hit harder than most other areas of the United States. We couldn't let our guard down, and we need to do whatever has to be done to take care of our patients." ■

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COVID-19 Pandemic Took a Toll on Vascular Surgery

The COVID-19 pandemic's effect on the healthcare industry has been profound: Outpatient surgery volumes dropped by 71% in the first months of the pandemic. At one point, hospitals collectively were losing $1.4 billion a day.[1]

Another more recent analysis revealed nearly nine of 10 elective ambulatory and inpatient vascular surgeries were canceled after the United States shut down at the beginning of the pandemic.[2]

"When it came to outpatient surgeries, around 89% of vascular surgeons had major disruption in the outpatient clinic," says **Nicolas J. Mouawad**, MD, MPH, MBA, FACS, vice chair of the department of surgery at McLaren Health System in Bay City, MI.

The Society for Vascular Surgery Wellness Task Force released an anonymous, cross-sectional survey between April 14 and April 24, 2020. Called the Pandemic Practice, Anxiety, Coping, and Support Survey for Vascular Surgeons, participants answered questions about their occupational exposure to COVID-19. adequacy of personal protective equipment (PPE), elective surgical practice, changes in call schedule, and their redeployment to non-vascular surgery duties.

The survey showed 71% of surgeons worked limited hours and more than 80% started using telehealth.

"Interestingly, there was a proportion of surgeons who offered no clinic or telehealth services and stopped offering vascular surgery care altogether," Mouawad reports.

About one-third of the 535 vascular surgeons who responded to the survey were asked to redeploy in the ICU or other places to perform non-vascular surgery tasks. One of their most common duties was placement of central venous catheters.

Nearly 18% of vascular surgeons operated on a COVID-19 patient. Most of the time, they waited outside the operating room during the intubation and used N95 respirator masks during the operation.

Most surgeons (94.8%) said they had adequate personal protective equipment. Only 6% of participants said they were self-quarantined after operating on a patient who later tested positive for COVID-19, Roughly 10% of survey respondents said they were tested for SARS-CoV-2.

Fewer than 1% of respondents said they tested positive for COVID-19, although 47.5% said they were considered at high risk for infection.

The repercussions of the suspension of elective vascular

surgeries are poor outcomes in patients because of the delays. Mouawad and colleagues are looking at data for a follow-up study to see whether more patients lost their legs, suffered strokes, or died because of delayed vascular care.

As the pandemic progressed, evidence showed that COVID-19 affected many patients' vascular systems.

"We know that COVID-19 can cause coagulation, clotting of blood, and we don't know the specific scientific reason yet, but we're well aware of that," Mouawad says. "People are presenting with a lot more blood clots, DDTs, and PEs."

Mouawad directs a pulmonary embolism response team.

"We have to remove the clots from their lungs because of this issue," he says. "We're seeing a lot of people come in with clots these days, secondary to COVID-19."

In the pandemic's next phase, vascular surgeons will be more aggressive about remaining available for operating on COVID-19-positive patients, according to Mouawad. Restoring confidence will take surgeons going to social media and using better communication tools.

"I've been very aggressive about that, personally, and while we're all worried and scared about COVID-19, we still have to go to the doctor and get things [treated], especially circulation issues," Mouawad says.

Surgeons are feeling safer as some elective surgeries resume and operating rooms try to return to some semblance of normal. Whatever happens, patients cannot wait forever to undergo important procedures.

"If I'm worried about a patient and am not sure whether the person is COVID-positive or not, then I'll operate on the patient and wear full PPE," Mouawad says. ■

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Certain Variables Can Lead Some Spine Patients to Report More Pain After Surgery

Spine surgery patients are most likely to control pain poorly after a procedure if they are female, younger than age 70 years, and record higher depression scores, according to a recent report.[1]

"We wondered why some patients had more pain control than others," says **Michael Yang**, MD, MSc, MBiotech, study co-author and neurosurgery resident at the University of Calgary.

Yang and colleagues conducted a retrospective cohort study of data from adult patients in the Canadian Spine Outcomes and Research Network registry. The patients underwent elective cervical or thoracolumbar spine surgery and had been admitted to the hospital. They found 57% of 1,300 spine surgery patients had experienced poorly controlled pain during the first 24 hours after surgery.

"We could not study ambulatory patients because we evaluated their pain experience in the first 24 hours. If they were discharged before then, they were not evaluated in our work," says **Steven Casha**, MD, PhD, FRCSC, study co-author and associate professor at the University of Calgary.

The authors developed a tool that could predict postoperative pain for spine surgery patients called the


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three-tier Calgary Postoperative Pain After Spine Surgery (CAPPS) score. Using CAPPS scores, investigators made three groups: low-risk, high-risk, and extreme-risk groups.

Investigators took 85 potential variables that came from the registry and narrowed these to 25 they could analyze with statistical models. A consensus of three neurosurgeons, one neurologist, and one biostatistician chose the 25 variables that could help predict poor postoperative pain.

The variables were selected for the likelihood they would offer additional prognostic information beyond what other variables provide. Also, researchers picked these variables because they are feasible for any spine center to collect.

"These 25 variables were then analyzed using a multivariable logistic regression model," Yang explains. "From this model, seven predictors were found to be significant."

On top of gender, age, and depression scores, additional variables associated with poorly controlled pain were: preoperative use of opioids, higher intensity of preoperative neck or back pain, previous fusion surgery, and three or more prior operations. "Almost all of the patients had neck and back pain," Casha notes. But those patients with higher-intensity neck and back pain were the ones more likely to struggle with pain control after spine surgery.

Using data from the seven predictors of poorly controlled post-op pain, investigators determined the odds that patients would experience poor pain outcomes. They predicted that 32% of the low-risk group would control pain poorly, 63% of the high-risk group would control pain poorly, and 85% of the extreme-risk group would control pain poorly.

"To ensure that our CAPPS score is accurate, we applied this score to a separate patient population — 30% of our data set — and showed that the predicted and the actual observed probability of poor pain control was very similar," Yang says.

Using the CAPPS score, physicians could tailor individualized treatment to a specific patient, Casha says.

"This is a simple tool that should be easy to adopt," he offers. "It can be used to educate people to their sensitivity to pain and to prepare them for the postoperative pain experience."

For instance, if a patient has taken opioids before surgery, then physicians could recommend they reduce or eliminate their opioid use before the procedure, Casha suggests. "If you get someone off daily opioids, then you could change their CAPPS score, and perhaps that would lead to a better pain experience."

Casha says future research may uncover even more variables. For example, sleep patterns could be one. If patients are insomniacs, they might struggle with pain control. Anxiety, separate from depression, could be another. "Pain is a subjective thing," Casha observes. "One person will express it as a catastrophe, while someone else considers it livable."

Researchers can measure patients' heart rates and other vital signs that might indicate pain, but the responses would be variable.

"At the end of the day, pain is what a person experiences, and it's how well they tolerate it that matters," Casha observes. ■

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Technology Offers Clues on Creating a COVID-19-Free OR

Early in the COVID-19 pandemic, Bascom Palmer Eye Institute in Miami built a negative air pressure room to handle patients with the virus.

"A group of engineers from the University of Miami worked to construct an examination room," explains **Zubair Ansari**, MD, assistant professor and medical director of outreach, cataract, comprehensive, and global ophthalmology at Bascom.

Staff created a negative pressure room for patients who needed emergent eye surgery and who tested positive for COVID-19 (or even exhibited viral symptoms). "All patients who go into that room need double masks. Our physician and ophthalmologist wear the N95 mask and a head shield when they examine those patients," Ansari explains.

The room has been maintained for COVID-19 patients through the summer and moving into the fall. "We were fortunate to have that room because I don't know of any other way we could examine [COVID-19 patients]." Healthcare leaders may be looking for technological solutions

like this to keep ORs and other spaces free from the virus. The authors of a recent study found using an air scrubber and combining it with a portable plastic wall could keep particles as airborne and small as SARS-CoV-2 from circulating.[1]

The authors of another study suggested placing COVID-19-positive or suspect patients in a room with negative air pressure that ventilates directly out of the hospital.[2]

In yet another study, researchers found using a negative pressure environment is ideal to reduce dissemination of the virus, especially if this special room is separated physically from the other ORs.[3] Each OR included its own ventilation system and integrated high-efficiency particulate air filters. Staff minimized air flow by locking all doors to the OR during surgery, leaving only one exit/entry route.

In March, the FDA issued guidance suggesting UV disinfecting devices could augment disinfection of health surfaces after manual cleaning. *(https://bit.ly/3iY4epc)* Also, UV devices or air purifying devices may be used to kill pathogens and microorganisms in the air. ■

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CME/CE QUESTIONS

1. **A study of eye surgeries revealed there was a decline in such procedures from 2019 to 2020. In April 2020, there were 117 procedures. How many surgical procedures occurred for the same period in 2019?**
   a. 170
   b. 332
   c. 683
   d. 1,107

2. **Spine surgery patients are most likely to struggle with pain control after their procedure if they are:**
   a. older than age 70 years, underwent recent dental surgery.
   b. intolerant to opioids, male, report leg pain.
   c. female, younger than age 70 years, use opioids preoperatively.
   d. married, older than age 60 years, never underwent surgery.

3. **Which was one of the chief results of the COVID-19 pandemic's disruption to medical supply chains in 2020?**
   a. Surgery centers could not obtain SARS-CoV-2 testing kits as needed.
   b. American manufacturers went from making 10% of personal protective equipment to 95%.
   c. Price fluctuations and products like N95 respirator masks sold for up to six times the usual price.
   d. Surgery centers did not receive the respirators they needed.

4. **Which medical product remains in high demand but in short supply?**
   a. Bouffant caps
   b. Surgical gloves
   c. Orthopedic screws
   d. Tylenol

CME/CE OBJECTIVES

After reading *Same-Day Surgery,* the participant will be able to:

- identify clinical, managerial, regulatory, or social issues relating to ambulatory surgery care;
- identify how current issues in ambulatory surgery affect clinical and management practices;
- incorporate practical solutions to ambulatory surgery issues and concerns into daily practices.

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