EXECUTIVE INSIGHTS

RESILIENCY + RECOVERY

Rising Demand for Surgeries and Advancing the Quintuple Aim Through Innovation

Ensuring access to safer, less invasive surgical care means better patient and surgeon experiences

American Hospital Association™

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Ensuring access to safer, less invasive surgical care means better patient and surgeon experiences

With the growing demand for surgical care, health care organizations are turning to innovative technology to help achieve the goals of the Quintuple Aim: to improve outcomes, lower the cost of care, provide a better patient experience, enhance workforce engagement and advance health equity. Many are exploring the opportunity to evolve their perioperative activities with robotics, visualization and digital intelligence. Artificial intelligence (AI) is a present-day game-changer in surgical care by enhancing surgeon capabilities; supporting informed, real-time decision-making; and improving the efficient delivery and quality of care to achieve more positive outcomes for patients, surgeons and care providers. This executive dialogue explores the impact of technology and successful strategies in surgical and perioperative performance that can improve patient outcomes, increase care team satisfaction and enhance the patient experience while lowering the total cost of care.

10 WAYS hospitals can integrate AI and automation into surgical care

1 | **Pilot surgical optimization software** to make intelligent decisions that support better staffing, scheduling and patient flow to unlock capacity in operating rooms.

2 | **Integrate information from different technologies** — electronic health records, backbone systems, equipment technologies and robotics — for insights to improve quality and efficiency.

3 | **Use AI to know your own truth** by extracting, analyzing and synthesizing patient encounter data (clinical, financial and operational), looking for trends, outcomes and evidence-based reporting on what patient procedures work the best.

4 | **Provide surgeons real-time information** about their cases, procedure times and instrumentation usage with objective performance indicators and feedback for improvement.

5 | Provide the means to **learn with a touch-enabled device** that allows you to record video and collaborate during surgical procedures, get second opinions in real time and have case observations to reduce variation and standardize the techniques.

6 | Enhance surgical training and optimize the care team with **extended reality technology**, making real-time training easier and more scalable between surgeries and between cases for the care team in a virtual reality format.

7 | **Employ integrated intelligence and a phased approach to quality improvement** and compare to national benchmarks.

8 | **Standardize the electronic consent process** to improve patient-centered care.

9 | **Examine the surgical optimization clinic criteria with AI** to determine which patients truly benefit from going through that program.

10 | Customize a **surgical-site infection predictor tool** to positively impact patient outcomes.

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THE RISING DEMAND FOR SURGERIES AND ADVANCING THE QUINTUPLE AIM THROUGH INNOVATION

MODERATOR *(Suzanna Hoppszallern, American Hospital Association):* **What technology-based approaches to surgery is your organization using in hospital-based surgery services and ambulatory surgery centers, and what impact is it having on staffing, resource utilization and patient outcomes?**

ANDREA LESLIE *(Corewell Health West):* We are piloting surgical optimization software, but we're early on in that process.

NATE ORTIZ *(Baptist Hospital of Miami):* We're in Week 2 of our 15-week implementation cycle on a system to provide some advanced analytics and improve utilization of our operating rooms (ORs).

KIM KERR *(Hendricks Regional Health):* I'm the chief of surgery at our facility, and we're just getting to the integration of all our digital images into our electronic health record (EHR). We're early in integrating our EHR into our OR services.

GRISELLE PASTOR *(Doctors Hospital):* On the ambulatory surgery center side, we're piloting optimization software to help us utilize block time appropriately and improve surgical utilization. The artificial intelligence (AI) technology provides data insights and scenario modeling to help us communicate collaboratively and productively with surgeons about changes needed to their block time in order to improve their individual block time utilization and the overall surgery center utilization.

MODERATOR: **Several of your organizations are using advanced analytics. Is it moving the needle on patient outcomes and staffing, and resource utilization?**

ORTIZ: I struggle with the integration of all the information available. If we are to make significant progress in the surgical arena, our systems need to be able to communicate and talk with each other. We keep adding different technologies — EHRs, backbone systems, equipment technologies and robotics — and their integration one to another. It puts a unique burden on our teams and staff to have to master many technologies, which isn't realistic anymore. Looking forward to the impact on patients and outcomes, the high specialization required makes it difficult to run the same standard of care 24 hours a day.

JOSH KOOISTRA *(Corewell Health West):* There are a lot of promises from AI companies. We chose to go with our EHR vendor first and are piloting its advanced analytics, but it's too early to say. I haven't talked with any health system leaders who have seen significant improvements yet, but I think the promise is on the horizon.

We have had success with standardizing our electronic consent process. We conducted a pilot in our ambulatory surgical centers for anesthesia consents and are planning to roll that out more broadly. When it comes to procedural consents, it's challenging: Who's doing the consent? At what time is the consent done? Is a nurse obtaining the signature? Is the physician having the discussion?

JASON HART *(Intuitive):* It's great to see many familiar faces and organizations that have success and experience with da Vinci robotic surgical systems. We're integrating support and functionality from pre-, intra- to post-op with our digital components. That integration is what we think has enabled the widespread adoption over the last couple of years compared with analog solutions.

We believe it's more powerful when you have your own data, your own truth. We have a market access and data analytics team. It's a free ecosystem resource designed to extract patient encounter data (clinical, financial and operational), analyze them, synthesize them, look for trends, compare the value of da Vinci systems against others, and indicate where da Vinci can provide even more value through fact-based data.

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MODERATOR: Are staffing shortages impacting access to surgery, patient safety, patient satisfaction or hospital's financial performance? What strategies are you using to optimize procedures or increase capacity?

IRENE RICHARDSON *(Memorial Hospital of Sweetwater County):* Our primary service area includes about 42,000 people. The nearest hospital to the east or west, is about 100 miles. We're a stand-alone, rural hospital. During COVID-19, several of our staff took traveler positions where they were paid a higher rate. Fortunately, we've been able to attract many of them back.

One year during the pandemic, we spent more than $7 million for contract staffing. We've brought that down now, but it's still high. Even with these financial challenges, we didn't lay off any staff or discontinue any services. Our staff are valuable to us, and we want to make sure that they know that. We maintained the proper staffing ratios for all our patients, but we've had to supplement with contract staffing. We renegotiated rates with the contract agencies, and many people chose to stay on with us. We hired them as either temporary staff or contract staff. We also added staff with certified nursing assistant credentials and medical technicians for a team approach, and we tried to grow our own. We're giving out scholarships to people who want to go to a two-year community college here to earn their associate degree in nursing.

Our volume has exceeded our pre-pandemic levels. It's been extremely busy. Again, we supplement with contract staffing because we want to maintain those staffing ratios. We want to make sure that both our staff and patients are safe and satisfied.

"On the ambulatory surgery center side, we're piloting optimization software to help us utilize block time appropriately and improve surgical utilization. The artificial intelligence technology provides data insights and scenario modeling to help us to communicate collaboratively and productively with surgeons."

— Griselle Pastor — Doctors Hospital

HART: Staffing was a challenge heading into COVID-19 and now, coming out of it, it has been exacerbated. Our Genesis team, a specialized group of surgical training professionals, works with hospitals on training and optimizing the care team. Staffing was their No. 1 area of focus for the last two years, and it continues to be today.

For example, at a major university medical center, they were able to reduce their full-time staff members from three to two in many of their da Vinci rooms — instead of having a first-assist nurse and scrub technologist, they were able to replace the first-assist in those rooms with a scrub technologist and a circulator nurse, which allowed the first-assist to float to other rooms.

No one left the organization, but they redeployed and brought the cost down in the da Vinci rooms. In addition to reducing the cost, it drove the engagement and morale up. They put a culture of continuous improvement back in rhythm, and they were working less at a time when they needed to reduce their stress level. There are solutions with technology and coordination of care to help optimize staffing, leading to increased staff satisfaction

ORTIZ: In South Florida, surgical technologists are the No. 1 staffing challenge. Programs in our community are not training enough of them. We compensate by having nurses who scrub in.

BARBARA MATIAS *(West Kendall Baptist Hospital):* To resonate what Nate said, the challenge of hiring experienced surgical technologists is a significant one. Fortunately, I have several nurses who had been surgical technologists previously. In a moment of need, instead of having to hire travelers, I've

asked them to cover as technologists to meet the demands of surgery.

Our volume was up by 15%. To manage the volume, our department facilitated and cross-trained nurses in the pre-op and recovery areas. The endoscopy team also supports both areas. That seemed to optimize our most expensive asset, which is our people.

CARY GIBBS *(Hendricks Regional Health):* I would agree that the surgical technologist role is the hardest to fill right now. I work with Dr. Kerr, who is here as well. We've just had these conversations and are already seeing a shift. When I came here, there was a big push not to have RNs scrub because you pay RNs more, but we're going to have to go back to training RNs to scrub in for basic cases so we can have flexibility in staffing. Surgical technologists are hard to find. I've reached out to our local community colleges to let them know that we are interested in being a host site for clinicals, but that's a long-term plan, not a short-term solution.

MODERATOR: Are any of you having capacity issues or a backlog of surgical cases?

TRACI LAVIGNE-MILNES *(St. Joseph Hospital):* Right now, our utilization is high. We're considering opening additional rooms to ease the backlog. We have some space for it, but we're not sure about staffing that sort of model long or short term. One option is to use travelers to start and see if we can build that into a permanent solution. We're not sure where our volume will land, because as everybody has experienced, it's significantly increased since 2020. We need to have open access. The one thing physicians don't like is to wait days, weeks or months to get their cases on the schedule, nor do patients, and we don't want that.

GIBBS: Our surgery center is on an upward trend; our volumes have increased and we have recruited some new providers. Originally, we were looking to create ORs in a smaller hospital that we recently built, but now we're rethinking that and plan to restructure the surgery center to make sure that we can use it to full capacity.

"We keep adding different technologies — EHRs, backbone systems, equipment technologies and robotics — and their integration one to another. It puts a unique burden on our teams and staff to have to master many technologies, which isn't realistic anymore."

— Nate Ortiz —
Baptist Hospital of Miami

MODERATOR: Several of you mentioned that you're looking at integrating your EHR and using analytics and AI. Are you using these data to develop evidence-based improvements and modeling surgical care pathways for prevention, diagnosis, intervention or postoperative recovery, and to accurately predict severe complications?

PASTOR: The AI program is in the early stages of development; we've partnered with a company to help them develop surgical optimization in the ambulatory surgery center. We also partnered with a patient intelligence software company to help us collect data on orthopedic patients. We haven't seen the outcomes for patients, but patients are completing surveys before and after their surgeries to provide information on their pain levels before, during and after surgery. We hope to use that platform to give us outcomes and then evidence-based reporting on how or what we should do and what procedures work best for patients.

RICHARDSON: Not that COVID-19 wasn't challenging enough, we decided to do an EHR conversion in the middle of the pandemic. We're still trying to learn all the capabilities of the EHR. Some of the quality data has been beneficial. There's much more that we can look at, but trying to make sure that we can use the system to obtain quality data is at the forefront for us.

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HART: We are looking at integrated intelligence and a phased approach to quality improvement. The first step is to begin utilizing digital and data resources to improve quality. From our perspective, we have our My Intuitive app where we provide, at the surgeon's fingertips, real-time information about their case, procedure times and instrumentation usage. It's the basics, and then we compare it to national benchmarks. In this first phase, we have our customers look at their data deeply — looking at the utilization of the equipment and how to optimize it.

In Phase 2, we start engaging more directly with hospital information technology departments and executives, where we have Intuitive Hub, a touch-enabled device that allows you to record video and collaborate during surgical procedures. From a quality perspective, it enables learning. You can look at the videos, collaborate remotely, get second opinions in real time and have case observations. If the goal is quality, how do we reduce variation and standardize the techniques?

The next phase is using AI to give surgeons true insights and data back in real time. We do that with objective performance indicators (OPIs), where we analyze the videos and give the feedback to the surgeons. The surgeons can view, edit and share the videos, they receive an OPI metric afterward, a report card on the procedure through their app that says, "Have you looked at this video for inguinal hernia? There might be some tips in there you could learn for that case. And, by the way, here's a simulation module that might help you as well." This is an example of how AI can help to improve quality by giving surgeons objective indicators to help improve their performance.

ORTIZ: In the OR environment, we're examining the opportunities for quality assurance (QA) and demonstrating competency. As we review cases, one of our challenges is that we are limited to a few images, the note and somebody's recollection of what happened during the procedure. Jason, are you saying that these technologies can allow for actual reporting and can be leveraged during the QA process?

HART: That's a great point, Nate. We're finding that a majority of the centers that are engaging in this technology with us are finding the most value in quality initiatives. The quality departments are leading it with their surgeons as they proceed on that journey, which is what we want for patient care.

"All our Level I traumas that go to the OR are reviewed to optimize how we cared for those patients. We've seen good results and are looking at expanding that review to other ORs."

— Joshua Kooistra — Corewell Health West

MODERATOR: Any additional comments on surgeon evaluation, giving surgeons feedback on quality outcomes?

KOOISTRA: All our Level I traumas that go to the OR are reviewed to optimize how we cared for those patients. We've seen good results and are looking at expanding that review to other ORs. If there was a misplaced specimen, we can figure out why that happened rather than relying on recollection and chart biopsies.

HART: What does the group think is the biggest barrier to giving surgeon feedback in real time with these OPIs? What other barriers do we need to be aware of to help improve quality?

KOOISTRA: With specific cases, patient and anatomic variation are going to be a bit of a barrier, but an aggregate review might give you more feedback.

ORTIZ: How that information is shared with others can help to provide mentoring and improve quality, but sharing is difficult. New surgeons, who recently

completed training, need mentoring.

KERR: It's how you share the information. What are the legal ramifications for how it's shared? It's a great tool when you're a small facility with three to five surgeons in any one subspecialty to send cases out for peer review.

MODERATOR: **Many of you are in a position where you're growing your volume. What are your plans for intelligent automation and integration in surgical services?**

MATIAS: With the launch of a new scheduling platform and data reporting capabilities, we'll be able to have candid conversations with physicians to optimize their time or to see what time fits best for their schedule. That's instrumental for any leader in surgery to optimize the utilization of their ORs.

GIBBS: We're looking at many things. We went live with our EHR and medical imaging integration. We're also planning something similar in our endoscopy units with microscope imaging software and reporting software.

Our EHR has a lot of tools we haven't tapped into yet; we discovered that there is a surgical-site infection predictor tool and we're exploring how to customize it for our organization to impact outcomes positively.

We use several power business intelligence reports to produce data for us, which has been helpful. In the future, from a nursing standpoint, anything that helps to optimize training will be useful, because we are going to have a young and inexperienced workforce. We will be lucky to get an experienced RN, but they usually don't have the OR experience.

PASTOR: I'm in the same system as Carlos and Nate. We have the same performance indicators to make sure that we optimize our ORs, use the block time efficiently and ensure that cases start on time. We are having some challenges recruiting anesthesia providers, certified registered nurse anesthetists and surgical technologists. If you don't have anesthesiologists or surgical technologists, it's hard to schedule surgeries and optimize your OR.

KOOISTRA: We have a robust surgical optimization clinic that looks at smoking cessation, hemoglobin A1C, blood pressure, and figures out which patients truly benefit from one of these programs vs. putting people through a program unnecessarily because their risk is low, or the surgical risk is low. Optimizing that clinic is ripe for AI to examine the impact the clinic may have on certain patient populations.

GREGORY MANCINI *(University Health System):* In our main OR, our block time is almost all allocated and that creates a scheduling problem. Over the years, we've tried to modify drop times and personalize them to specialties based on when cases are added or removed. That has not worked. We are going to be trialing a new AI-based scheduling process that will move away from high blocking to where we can encourage and reward physicians for early return, telling us when they're going out of town for either meetings or vacations. We haven't had visibility into that information and the new scheduling system will integrate that. We hope to have more flexibility for our add-ons. Due to the inpatient services we provide, we have about a 30% add-on rate in our institution. We hope that AI and the scheduling system can help us clear the schedule earlier to accommodate the add-ons.

Quality fits under the umbrella of our Center of Excellence. With the optimization clinic concept, we try to benefit from the learning of other institutions. AI can help us with patient selection and the data around it to decrease length of stay and complication rates. That will help us take our next step forward.

HART: When we think about integration, AI or intelligent automation, we want to give real-time

information, not delayed information, and feedback to surgeons, care teams and executives.

Enabling more access and team training has been a constant theme throughout this discussion. With extended reality technology, we can make real-time training between surgeries and between cases for the care team in a virtual reality format easier and more scalable. Instead of having to coordinate long weekend courses to train the teams, we can do it near real time to make it more convenient as travelers come in and as different care team members rotate in.

What if surgeons received real-time feedback in terms of how precise the force was that they're applying during an exact moment of that case? What if they could access insights on an iPad afterward to understand how they could make quality improvements? Could that help outcomes if they understood how much tugging, how much retraction, how much tension they're putting on tissue or the anatomy during a procedure? Eventually, we will be able to predict and review certain cases, patients and surgeon scenarios by looking at patient selection and the types of techniques being applied.

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— Jason Hart, Intuitive —

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