



The OR of the future is here – How Intuitive, the maker of da Vinci robotics, is innovating surgery in the digital age

Becker's Healthcare | Intuitive

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Before the industrial revolution, surgery was risky, ineffective and perhaps more art than it was science. The advent of anesthesia and aseptic technique [revolutionized](#) the practice of surgery and opened the doors to previously unimaginable technological advancements that have saved and improved countless lives.

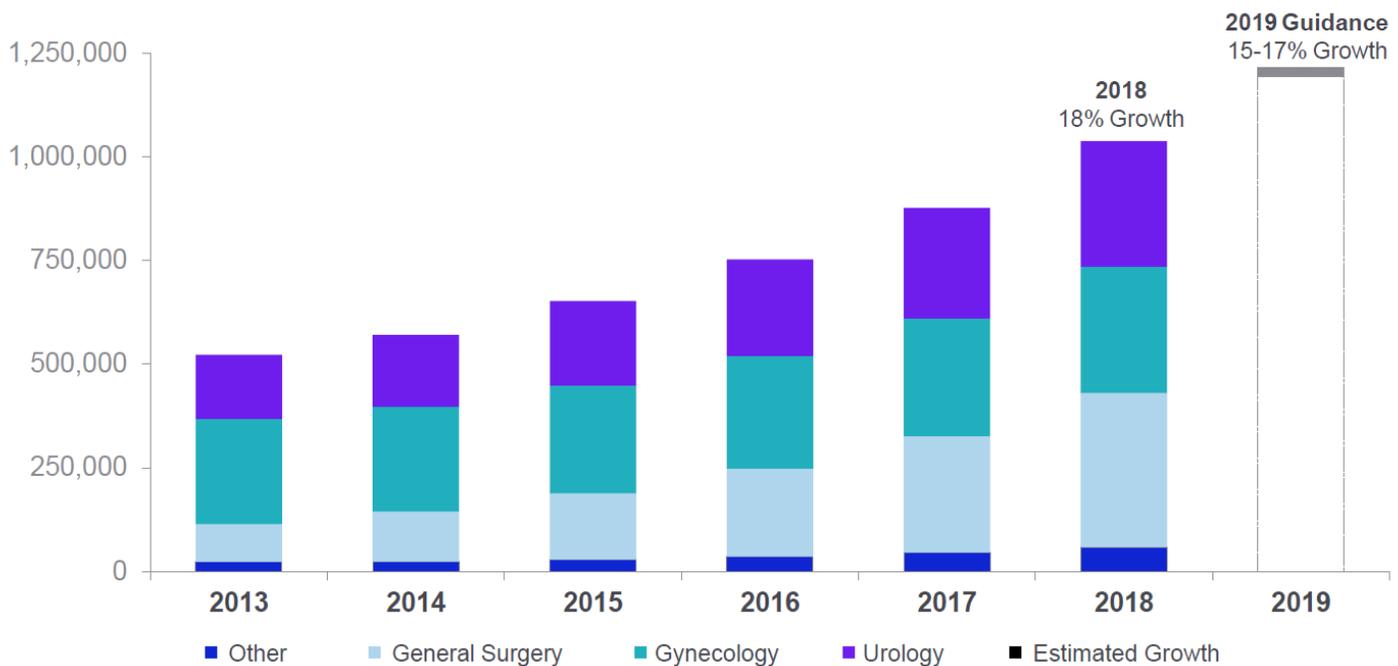
Though more effective and safer than at any time in human history, modern surgery remains a complicated endeavor requiring robust scientific expertise and physical acumen. And while technological advancements in the digital age have led us to expect precision in our interactions with consumer-driven industries, the same cannot be said for surgical care. Certain types of procedures, such as treatments for rectal cancer using open surgery, continue to be associated with overall complication rates as high as 35 percent, according to a 2016 study¹ published in the journal [Clinics in Colon and Rectal Surgery](#).

“If your iPhone dropped every third call and had that kind of performance, you would throw it out, so why would that be acceptable here” said Gary Guthart, PhD, CEO of Intuitive. “And of course, the problem is actually worse than this ... if a patient sees a surgeon who ranks in the lowest quartile of performance, the patient is three times more likely to experience a complication than if he saw a surgeon in the top quartile.”

Dr. Guthart discussed the importance of eliminating clinical variation in surgery during a summit on surgical robotics and the value of a robotic-assisted surgery program hosted by Intuitive at Becker’s Hospital Review’s 10th Annual Meeting in Chicago on April 2. The event featured presentations from Intuitive executives and health system leaders, who discussed the keys to launching a robotics service line and how a robotics surgical program supported by data helps providers achieve quality improvement goals.

¹ Chiu CC, Hsu WT, Choi JJ, et al. Comparison of outcome and cost among open, laparoscopic, and robotic surgical treatments for rectal cancer: A propensity score matched analysis of nationwide inpatient sample data. *Clin Colon Rectal Surg*. 2016
Other publications may show different results.

Worldwide Procedure Trend²



Robotic surgery and the Quadruple Aim

The Quadruple Aim, an expansion of the Institute for Healthcare Improvement's Triple Aim, is a framework for healthcare delivery that calls for 1) better outcomes, 2) lower total cost of care, 3) a better patient experience and 4) a better care team experience. Provider organizations nationwide are using this four-part model to construct care improvement initiatives designed to adapt to the industry's transition toward value-based care.

During the summit, Darla Hutton, Vice President of Marketing and Custom Analytics with Intuitive, said robotic surgery can be used to help achieve the Quadruple Aim and that Intuitive's primary goal is to improve care outcomes with its da Vinci Surgical System.

The idea that robotic-assisted surgery aligns with the Quadruple Aim is supported by clinical research centers, including the [Cancer Treatment Centers of America](#).³ However, the utilization of surgical robots alone will not achieve every tenet of the Quadruple Aim. To collectively achieve its four goals, providers must also make the most of the people and resources in the operating room. This requires data-driven insights.

When a hospital acquires a da Vinci Surgical System, it gains more than a sophisticated piece of hardware. Intuitive offers technology learnings and access to an

"We've not only innovated around the hardware, but around the software that's embedded in that hardware. With analytics, we can identify operational variance and its potential economic impact. Then, we can use the rest [of the Intuitive ecosystem] to help fix the problem."

- Darla Hutton

integrated ecosystem of support resources. Additionally, the company has compiled clinical data on robotic surgery for 20+ years. In 2014, the company launched their 4th generation operating system equipped with data analytics technology that can assess individual surgeon

² Data on file

³ Cancer Treatment Centers of America. Robotic Cancer Surgery: Benefits from Da Vinci Surgical System. <https://www.cancercenter.com/treatment-options/surgery/surgical-oncology/robotic-surgery>. 2019



performance as well as hospital performance at the service line and national level. Intuitive's data analytics platform is informed by more than 8 million surgical encounters. Armed with these software capabilities, providers can identify patterns in operational variation and help craft informed strategies to address them.

"We've not only innovated around the hardware, but around the software that's embedded in that hardware," Ms. Hutton said. "With analytics, we can identify operational variance and its potential economic impact, and then we can use the rest [of the Intuitive ecosystem] to help fix the problem."

The technology can also identify opportunities for peer-to-peer training, days in which the OR is underutilized, and operational variation regarding processes or use of instruments and accessories for specific procedures.

Ms. Hutton relayed her experience with a hospital that told her its surgeons were using more instruments than necessary during a non-complex gynecological surgery. The Intuitive support team worked with the organization on an effort to reduce variations in instrumentation use for gynecology procedures.

Through their data analytics platform, the Intuitive team identified the root cause of the issue – the problem actually initiated with the organization's top-performing surgeon for the procedure. In this single surgeon's experience, she performed both simple gynecological

procedures and more complex gynecologic oncology procedures. She was also the instructor for other gynecology surgeons at the hospital who only conducted the non-complex procedures. The task force found the top-performing surgeon was teaching the other surgeons complex instrumentation processes that she standardized for herself but were unnecessary for the non-complex procedures the other surgeons were performing. The result: overuse of instrumentation, which cost the hospital more per case.

Leaders discussed the issue with surgeons and eliminated the wasteful use, yielding potential cost savings.

This progression toward performance improvement and cost savings is not unique for hospitals that deploy surgical robotics programs backed by data. During the summit, leaders from Hackensack (N.J.) University Medical Center and Newport Beach, Calif.-based Hoag Memorial Hospital Presbyterian discussed how their respective organization's launched and maintained successful robotics surgery programs.

The 4 cornerstones of Hoag's surgical robotics program

Hoag Memorial Hospital Presbyterian is the 443-bed flagship hospital of the Hoag Health Network, which comprises three hospital campuses. Michael Ricks, Executive Vice President and COO of Hoag Memorial Hospital Presbyterian, said Hoag's robotics journey

began in 2005 when it performed just 42 robotic-assisted surgeries. In 2018, Hoag surgeons performed more than 2,100 robotic-assisted surgeries across its Newport Beach and Irvine campuses. The health system has been recognized by multiple accrediting bodies as a center of excellence for robotic surgery.

“Right now, we have five da Vinci robots – four on the Newport Beach campus and one on our Irvine campus,” Mr. Ricks said. “We’ve standardized the fleet to 4th generation systems and made improvements and upgrades along the way. All this has culminated in some nice recognitions.”

In 2016, Hoag earned designation as Center of Excellence in Minimally Invasive Gynecology from the AAGL and distinction as a Center of Excellence in Robotic Surgery from the Surgical Review Corporation. During the summit, Mr. Ricks attributed Hoag’s success to a commitment to the pursuit of perfection and four specific components.

Here is a breakdown of the four cornerstones to Hoag’s robotics program.

1. People: In addition to the 43 robotics surgeons working across eight specialties, Hoag leverages a multidisciplinary team to support its robotics surgery program. This team includes members of the health system’s finance, communications and marketing staff, as well as administrators, nurse navigators and operating room managers. Everyone plays a role in ensuring the robotics program operates efficiently, effectively and is adequately supported with the appropriate amount of resources.

“We think perfect care can be delivered and it should always be what we are striving for. Even if we fall short of perfection, we might achieve greatness and we will celebrate greatness as we continue down the path toward perfection.”

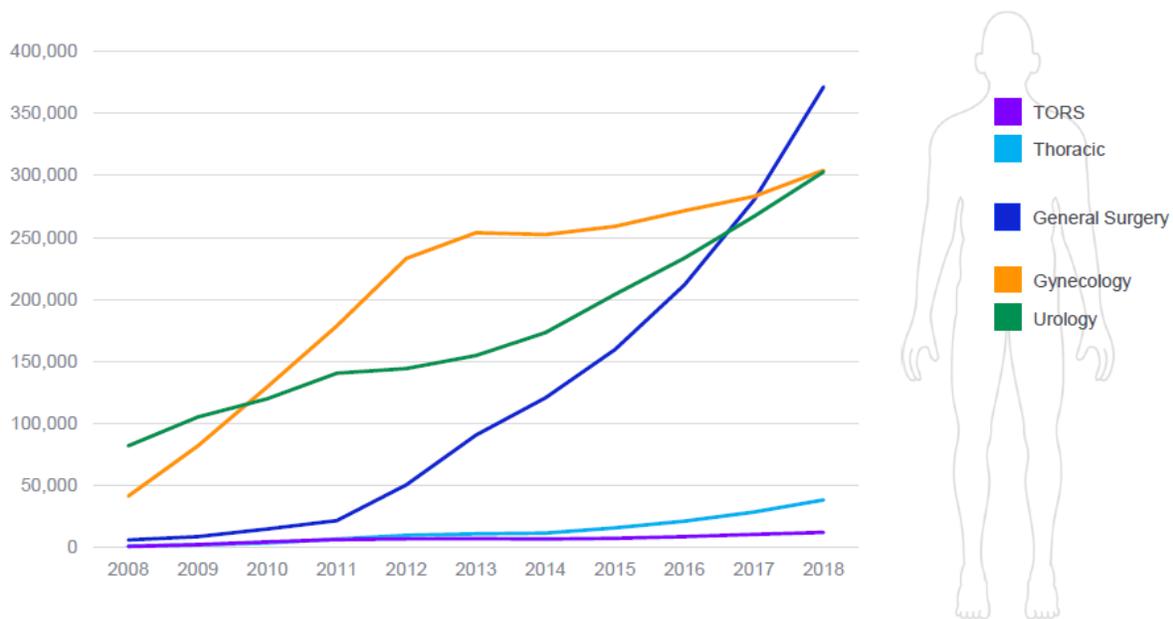
– Michael Ricks

2. Leadership: The Hoag robotics program has generated significant buy in among physicians, with a major contributing factor being that both heads of the program are physicians themselves. The clinical head of the program is John Brown, MD, a practicing OB-GYN, and the administrative head of the program is Allyson Brooks, MD, Hoag’s Chief Quality Officer. In addition to two physician leaders, the Hoag robotics program is supported by a minimally invasive surgery committee. The health system established the committee in 2009 with the aim



Growth in procedure categories⁴

Global over past 10 years



of improving quality and decreasing the cost of care for gynecological surgery patients. The committee includes surgeons, operational staff and hospital administrators.

3. Data and analytics: Hoag's data analytics dashboard tracks a number of performance measures for their robotics program, including standard measures such as length of stay, readmission rates and direct cost per case, among others. The data the system compiles also offers more granular insights into the surgical program by assessing the number of surgical cases, the hours spent on each case and the amount of revenue generated by each surgery. The system also tracks the percentage of surgical cases performed laparoscopically, robotically and with an open technique. Collectively this information allows the surgical committee to identify potential opportunities to grow the program, deliver better outcomes and improve operational efficiency.

4. Partnership: According to Mr. Ricks, Hoag's partnership with Intuitive is unique and unlike any other vendor relationship he's experienced. The Intuitive team has extensive on-the-ground knowledge about the health system's robotics program and offers clinicians and administrators access to a host of resources, including educational training, technology support and data.

"This investment is more than just a transaction; it's really a transformation and a partnership," Mr. Ricks said. "I look forward to my interactions with our da Vinci reps. I know them, they know me, and I know the help that they provide. It's an honor to have that relationship."

How Hackensack UMC uses robotics to help pursue Quadruple Aim – 3 keys to success

Hackensack UMC is the 781-bed flagship hospital of one of the nation's largest health systems, Edison, N.J.-based Hackensack Meridian Health. The medical center was the third hospital in the nation to purchase a da Vinci system in 2001. That year, Hackensack surgeons performed fewer than 100 general surgery procedures on the robotic system. Hackensack UMC now has 33 surgeons operating on five da Vinci Surgical Systems across six surgical specialties. In 2018, these surgeons performed nearly 2,000 robotic-assisted procedures.

Michael Stifelman, MD, chair of urology and director of robotic surgery at Hackensack UMC, has performed more than 2,600 procedures with the da Vinci robot. Dr. Stifelman said the accelerated growth of his organization's robotic service line by itself should be intriguing to executives. For organizations serious about achieving quality goals, the prospect of a robotics service line should be even more appealing.

During the summit, Dr. Stifelman outlined three steps to help ensure the successful integration of a robotics surgical service line.

1. Build trust: When launching a new service line, leadership must prepare clinicians for the transition. Individual providers are often skeptical of new initiatives, especially when they involve new technology. Surgeons' concerns should be addressed through alignment and open communication. Team members need to feel

⁴ Data on file



“We are extremely proud of our robotic service line and the culture we’ve established. The complete vertical integration—from hospital and system executives to our patient care team—is fully vested in the value our robotics program offers our patients. Robotic-assisted surgery aligns perfectly to our Quadruple Aim initiative, which, in large part, is why we have invested so much in the technology and infrastructure supporting our service line.”

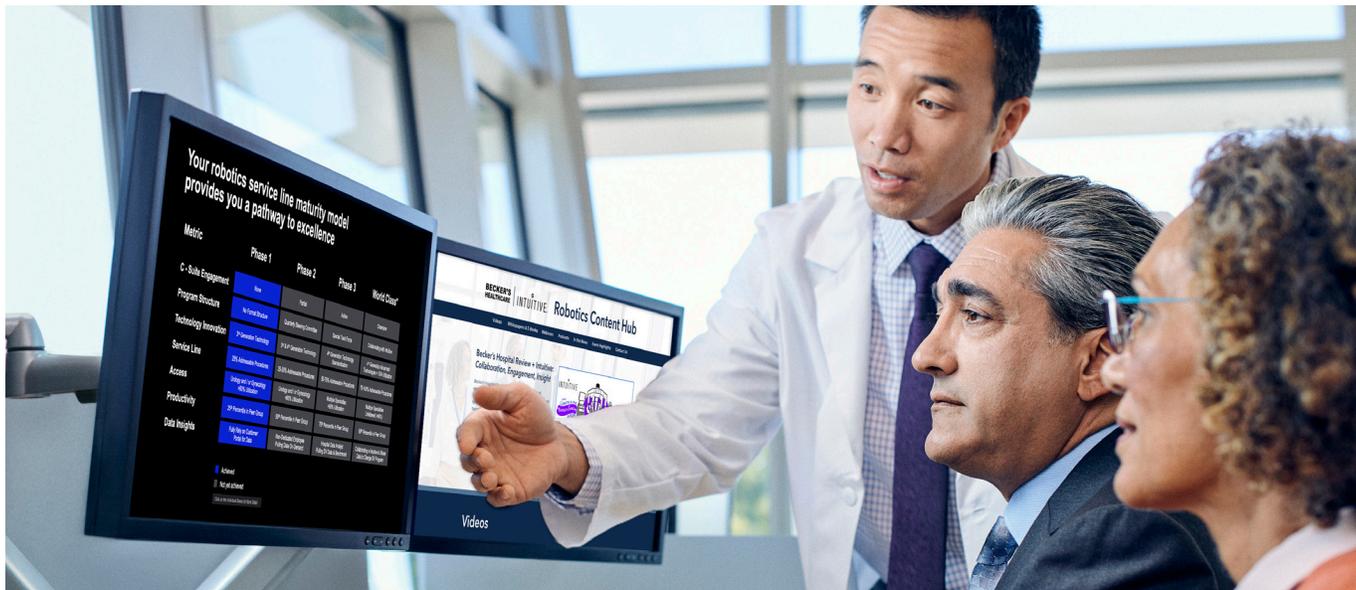
– Dr. Michael Stifelman

their voices are heard. Leaders must also consistently deliver the message that the new service line is meant to align individual providers to help pursue the hospital’s overarching goal of achieving the tenets of the Quadruple Aim.

2. Collaborate: Multidisciplinary teams should be constructed through a vertical integration model that gives voice to everyone from administrators and lead surgeons to nurses and technicians. A robotic surgery task force should also be assembled and scheduled to meet on a quarterly basis to discuss progress and new strategies for expansion or improvement. This task force should include executives, surgeons, OR leadership and representatives from Intuitive.

3. Leverage data: The data compiled through the da Vinci Surgical System is an essential component of building trust and creating an environment of collaboration. This operational data and other metrics should be compiled in dashboards in the EHR for physicians to track patient outcomes and performance improvement. This data will validate the importance of the service line.

“It can be really frustrating to be a surgeon and feel like you don’t have the resources you need to succeed,” Dr. Stifelman said. “If everybody is aligned to achieve the same goals under the Quadruple Aim and we share our data with the surgeons and we know how to use it to make



things better, it makes surgeons lives a lot easier. And, at the end of the day, you want your surgeons to be happy. You want your surgeons to bring their patients to your hospital.”

Expanding Possibilities

The continued evolution toward safer, more effective surgical care is not a given – it requires a commitment to continuous ingenuity and performance improvement from hospital executives, surgeons and technology developers. Dr. Guthart made the case that the element of human cooperation is essential to improving surgical care. He expects Intuitive’s partners to hold his team accountable for staying true to their commitments.

For 20+ years, human interactions/understandings and studies have always guided the design and user experience of Intuitive’s products and solutions. They have taken that knowledge and innovated with their smart systems and instrumentation for the robotic-assisted field – delivering solutions that are more intuitive, less invasive, and a better experience for the patient and surgeon. And through continuous innovation and collaboration with hospitals and surgeons, they will continue to help expand what’s possible.

“Having a great surgical tool is not enough, digital technology is not enough. It’s the integration of technology with a deep understanding of humans and team interactions. That’s what we’re invested in ... and I think you should hold us to a high standard.”

– Gary Guthart

The case studies presented are experiences of the individual institution and these experiences may not be representative.

The independent healthcare professionals quoted in this presentation have received compensation from Intuitive Surgical for consulting and/or educational services.

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