

# Robotic surgery as a growth engine



## Lessons from Northwell Health and Sharp HealthCare

Despite unrelenting financial and staffing pressures, some health systems are prioritizing innovation, investing in growth opportunities, and honing their competitive edge. In many instances, robotic-assisted surgery (RAS) is at the heart of this growth.

*Becker's Hospital Review* recently spoke with leaders from two health systems — Northwell Health (New Hyde Park, N.Y.), and Sharp HealthCare (San Diego, C.A.) — about their perspectives on innovation, growth, investment, and robotic-assisted surgery with da Vinci.

### Skepticism about RAS has waned

As recently as a decade ago, there was great uncertainty about the value of RAS. In 2012, open surgeries accounted for about 36 percent of surgeries; conventional, minimally invasive surgeries (MIS) represented 54 percent of surgeries; and robotic surgery with da Vinci represented about 10 percent of surgeries.\*

“In 2016, the robotic program at Northwell Health was met with a lot of cynicism,” said Frank Cascio, assistant vice president of program management at Northwell Health. “People said it takes too long, it’s too expensive, there is no outcome benefit.”

However, over the last decade, skepticism has waned and the landscape has changed dramatically as extensive data exists to support the clinical and fiscal impact of robotic surgery. The open and laparoscopic modalities have experienced declines while robotic surgery using da Vinci surgical systems has grown. Based on the industry data and the results and experience at Sharp, “We wanted to move forward to convert more open cases to robotic,” Christopher Walker, RN, COO of Sharp Memorial Hospital in San Diego said.

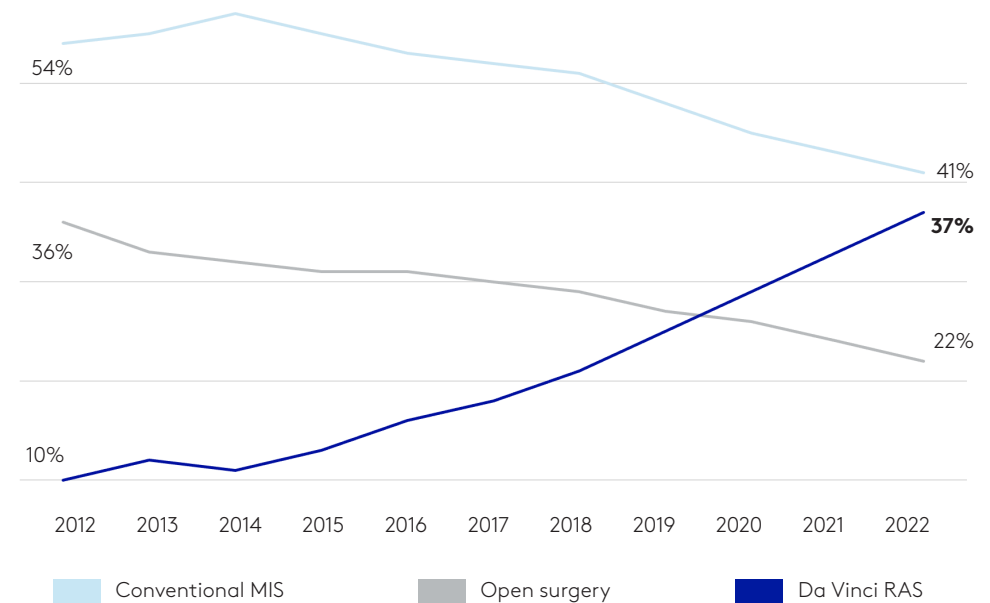
“I think as healthcare leaders, we can all agree that we want to reduce open surgery and use a minimally invasive solution wherever appropriate, but we’ve been able to understand via the data that it isn’t just a minimally invasive solution — it’s a robotic-assisted surgical solution for our patients, as that’s become our standard of care for certain procedures.”

#### Frank Cascio

Assistant Vice President,  
Program Management  
Northwell Health

### 10-Year Growth Trends in da Vinci Surgery

U.S. modality trends\*



\* Estimated volume of hospital inpatient and outpatient procedures, including: Bariatrics, Cholecystectomy, Colorectal, Foregut, Inguinal Hernia, Ventral Hernia, Hysterectomy - Benign & Malignant, Lung Resection, Nephrectomy - Partial & Radical, and Prostatectomy procedures. Intuitive internal estimates based on hospital inpatient and outpatient procedure data available from IQVIA (formerly IMS Health) for 2012- 2021, with 2022 estimates extrapolated from 2021. Da Vinci surgery volumes are for 2012 - 2022, which also includes procedures performed at ambulatory surgery centers. Data analysis, including ICD-9 and ICD-10 codes, are on file at Intuitive. Data and conclusions should be considered preliminary unless published in peer-reviewed journal.

### The foundation for growth at Northwell: clinical validation of better outcomes

It's no secret what has driven the rapid growth of surgeon and hospital adoption of da Vinci systems over the past decade. When Northwell Health made its first investments in da Vinci systems in 2017, leadership saw the importance of investing in purposeful, innovative technology. However, when making this investment they charged the robotics committee to "demonstrate quality outcomes, and we will continue to invest," Mr. Cascio said.

Demonstrating better outcomes is exactly what has occurred. Data from Intuitive\* that quantifies the clinical value of robotic-assisted surgery using the da Vinci surgical system shows that even with favorable open/lap operative times and comparable 30-day readmissions, there are significant differences in mortality, length of stay, complications, transfusions, readmissions and conversions that favor RAS versus laparoscopic surgery. These improved outcomes can lead to considerable downstream savings.

### Quantified Performance in Maturing Clinical Evidence

Outcomes favoring RAS	vs. Lap	vs. Open
Conversions	55% less likely overall	
Blood transfusions	28% less likely	70% less likely
30-day complications	14% less likely	39% less likely
Length of stay	0.4 days shorter	1.96 days shorter
30-day mortality	33% less likely	57% less likely
30-day readmissions	23% less likely	
<b>Comparable</b>		<b>vs. Open</b>
30-day readmissions		Comparable
<b>Favors lap/open</b>	<b>vs. Lap</b>	<b>vs. Open</b>
Operative time	18.8 minutes longer	37.3 minutes longer

Results are based on a meta-analysis of 253 peer reviewed literature for robotic-assisted procedures (right colectomy, LAR/TME, prostatectomy, partial nephrectomy, lobectomy, hysterectomy for endometrial and cervical cancer) published between 2010-2020. This work was presented at the ISPOR 2021 annual congress. The summary of clinical results are reflective of a pooled analysis of 7 systematic literature reviews, presented by outcome across different surgical procedures. While the meta-analysis results provide a single conclusion that is statistically significant or not statistically significant, these results are subject to variability. The results of this analysis may depend on several factors, including but not limited to patient characteristics, disease characteristics, the procedure of interest, and/or surgeon experience.



### **Planning for growth by an honest assessment of the past and a forecast for the future**

Many health systems have continued to acquire additional systems for robotic-assisted surgery, certify more users and experience tremendous growth in the number and percentage of surgeries performed using RAS.

For example, Northwell Health started with 12 systems in 2017, and at the end of 2023 expects to have 83 across its entire health system. “The evolution of our program has been tremendous,” Mr. Cascio said.

As the number of robotic systems has grown at Northwell Health, so too has the percentage of robotic-assisted procedures, with the da Vinci system now accounting for 24 percent of Northwell Health’s surgeries.

### **Now, the key question that leaders must answer is: What are the right investments for long-term success?**

“I think as healthcare leaders, we can all agree that we want to reduce open surgery and use a minimally invasive solution wherever appropriate, but we’ve been able to understand via the data that it isn’t just a minimally invasive solution — it’s a robotic-assisted surgical solution for our patients, as that’s become our standard of care for certain procedures,” Mr. Cascio said.

Based on future projections, Northwell Health anticipates RAS to account for 30 percent of inpatient surgeries. This led Northwell Health to conclude: “We want a footprint of systems that matches our growth,” Mr. Cascio said. “So, 30 percent of our ORs are going to be outfitted with da Vinci technology.”

At Sharp HealthCare, “We will need to change the way we have traditionally designed and equipped OR rooms,” Mr. Walker said. “We are using laparoscopic towers less and less but seem to have that technology in all rooms. I see big opportunities to eliminate traditional laparoscopic towers as base equipment and replace them with da Vinci robotic-assisted surgical systems for applicable procedures.”



“I see big opportunities to eliminate traditional laparoscopic towers as base equipment and replace them with da Vinci robotic-assisted surgical systems for applicable procedures.”

**Christopher Walker**

RN, Chief Operating Officer  
Sharp Memorial Hospital

He continued to explain that Sharp HealthCare’s data already shows their facilities should have more robotic systems than laparoscopic by threefold, but they still have threefold more laparoscopic towers. “I see that changing quickly over the next three to five years as equipment reaches its technological lifespan,” Mr. Walker said.

For each of these health systems, it was essential to forecast volume by surgical modality, look at asset utilization and have the same utilization standards for RAS as for laparoscopic towers.

**Making the case for investment — with flexible financing**

For health systems planning fleets of about 100 robotic-assisted surgical systems, this will entail a large capital investment. These investments can be justified by the health system’s demonstrated outcomes, considerable savings and expected growth. Still, despite the considerable value, this is a significant capital outlay. To assist health systems, Intuitive offers a variety of [flexible financing models](#) for acquiring robotic surgery technology. These customized models can range from leasing to purchase to usage-based models, tailored to meet each hospital or health system’s specific situation and short-term and long-term needs.

Mr. Cascio said Northwell Health’s C-suite was committed to investing in robotic technology. However: “We needed to address some of the financial concerns around acquiring a \$2 million piece of equipment,” he said. “And that was through the flexible acquisition model.”

At Sharp, the high cost of the da Vinci technology was a barrier to expanding the health system’s robotics program. “Because every system was over a certain price point, I had to take it to the board and convince them that we needed to spend the money,” Mr. Walker said. “With this new capital acquisition model, it doesn’t require board approval because we pay per case. We just have to be able to show that we are driving costs and revenue in the right direction — which we are — but we don’t need board approval under this model.”

**RAS can increase competition and help recruit surgeons**

Modern, state-of-the-art robotic systems can be important in attracting and retaining top surgical talent. 77 percent of resident applicants believe that robotic surgery will be very important in their future.<sup>1</sup> For Northwell Health and Sharp HealthCare, their world-class robotics programs have been valuable in their surgeon recruitment efforts. “We knew this would be a big advantage for surgeon satisfaction,” Mr. Walker said.

And not only are robotic programs attractive in recruiting new physicians, but Aaron Macoskey, PA-C, program director of system robotic surgery at Northwell Health, shared that Northwell Health sees many surgeons actively transitioning from traditional open or laparoscopic surgery to robotic-assisted surgery.

With over 1,450 equivalency certificates earned from the 2021-2022 academic year<sup>2</sup>, it’s important for hospitals and health systems to understand and take into account the interests and preferences of the residents and fellows who are coming out of training.

1. Krause, W., Bird, J. The importance of robotic-assisted procedures in residency training to applicants of a community general surgery residency program. *J Robotic Surg* 13, 379-382 (2019). <https://doi.org/10.1007/s11701-018-0859-5>

2. Information based on Intuitive internal data for 2021-2022 academic year.

Mr. Macoskey said, “We looked at what residents and fellows were being trained on within our [robotic surgery] program. We’re seeing that the majority of residents and fellows coming out of our training now have a certificate of competency on da Vinci technology.” He went on to say that at Northwell, they expect this growth to continue. This further shows the importance of offering access to a da Vinci system to help recruit and retain new surgeons at the health system.

### Using integrated intelligence to drive data insights

Implications of moving into the digital era are harnessing the data that the organization already has, mining the data, converting the data into information for decision-making and using the data to improve workflows both intraoperatively and post operatively.

Other uses of integrated intelligence include image capture during surgery, real-time, peer-to-peer feedback via Telepresence, procedure review, case reports and more. Mr. Macoskey said that Northwell Health sees value in the actionable digital insights in training care teams and enabling residents and fellows from across the Northwell Health system to watch a case being performed remotely.

### Conclusion

Trending data shows that health systems that have embraced and invested in da Vinci technology are seeing success with surgeon recruitment and greater attraction for surgeons overall which has in turn helped drive increased adoption and use of da Vinci technology. Intuitive data shows that surgeries using the da Vinci now account for 37 percent of all surgeries, up from 10 percent in 2012.

Now, as health systems look to the future, it is necessary to accurately forecast growth by surgical modality, analyze asset utilization for all modalities, determine where growth is likely — and draw conclusions about where investments are necessary.

As the industry leader in RAS, Intuitive has tools, resources, expertise and flexible acquisition models to help health systems achieve their growth objectives.

#### Important safety information

For important safety information, please refer to [intuitive.com/safety](https://intuitive.com/safety). For a product’s intended use and/or indications for use, risks, full cautions and warnings, please refer to the associated User Manual(s).

The implementation of a da Vinci program is practice and hospital specific. Results may vary. Past customer experience does not imply any guarantee of results in practice or program success.

When considering cost-effectiveness of an advanced technology like Intuitive products, we recommend that hospitals perform a full

cost-benefit analysis, considering not just the operating room costs but the costs associated with hospital stays, procedure-related complications and hospital re-admissions

Information contained herein for distribution in the U.S.

© 2023 Intuitive Surgical Operations, Inc. All rights reserved. Product and brand names/logos are trademarks or registered trademarks of Intuitive Surgical or their respective owner. See [intuitive.com/trademarks](https://intuitive.com/trademarks).