INTUITIVE

Addressing Patient Access Challenges by Enabling Robotic-Assisted Surgery in the ASC Setting

Hospital
Corewell Health Lake Drive Ambulatory Surgery Center (ASC)

Location
Michigan

Health System
Corewell Health

Challenge

Corewell Health has demonstrated significant advancements in patient care access and outcomes following the adoption and implementation of its da Vinci® surgery programs. Since implementing their da Vinci program, the hospital system has increased access to minimally invasive surgeries (MIS), reduced length of stay (LOS), lowered rates of surgical site infections (SSIs), and tracked fewer conversions from minimally invasive to open surgeries.

However, as surgeon and patient demand for da Vinci grew, access to the four da Vinci-equipped main hospital operating rooms (ORs) at Butterworth and Blodgett Hospitals began to constrain access to MIS, creating logistical and operational barriers to optimizing the full potential of their da Vinci program. These challenges affected both higher-acuity surgical specialties that required hospital OR time and low-acuity procedures where access was deprioritized when faced with capacity constraints.

Addressing these challenges would require innovative solutions, balancing the needs of diverse patient populations, surgeon demand, and efficient utilization of surgical resources.

Solution

Corewell Health's leadership established a dedicated RAS service line in their Grand Rapids Surgery center by transitioning a da Vinci Xi® system to their Lake Drive ASC setting to enhance access, efficiency, and care delivery, overcoming several challenges along the way. The hospital system added a second da Vinci Xi® 14 years later to meet the growing demand for RAS for lower-acuity procedures in the ASC setting. With RAS systems in the ASC setting, surgeons could shift lower-acuity procedures from hospitals, freeing up their main inpatient ORs for higher-acuity cases.

Corewell Health leaned into its small, efficient, and collaborative teams at the ASC to optimize the transition while leadership addressed barriers like space constraints, staffing, and initial team member education. Reframing first assist (FA) roles and being more proactive with capital planning, in particular, helped optimize RAS at the ASC. With strong support from Intuitive and promoting a robotics-first mindset, Lake Drive became a model for transitioning MIS to outpatient settings.

Qualitative Outcomes

Corewell Health's da Vinci program in the ASC enabled the hospital system to deliver the right care in the right setting while expanding access. As a result, Corewell Health improved the following:

- **Patient experience:** The RAS ASC improved accessibility for patients, particularly those who faced challenges traveling to larger, downtown hospital campuses.
- **Provider satisfaction:** Surgeons and staff reported increased job satisfaction, attributed to the collaborative environment at the ASC and the expanded opportunities for training and growth in robotic-assisted surgery programs.
- **Patient access:** Locating robotic systems in the community setting improved access for underserved populations, reducing barriers such as transportation and long wait times for surgical care.

This strategic move also maximized financial outcomes and enhanced the overall efficiency of the hospital system. Today, the Lake Drive ASC ranks third in robotic surgical volume across the region and has achieved the following:

- **807** open procedures avoided
- **18,752** minutes in the OR saved
- **460%** increase in lower-acuity procedures*
- **$5.6M** in incremental revenue* generated by adding 173 high-acuity procedures
- **1,101** high-acuity procedures* capacity generated

*From 2019–2023

Background

Corewell Health operates with the vision of a future where healthcare is simple, affordable, equitable, and exceptional. This vision is shared by its 65,000+ team members working across 21 hospitals and more than 300 outpatient locations in Michigan. One way Corewell Health delivers on its mission is by expanding access to minimally invasive care through RAS.

Corewell Health (formed in 2022 through the merger of Spectrum Health and Beaumont Health) began offering RAS with da Vinci in the Grand Rapids area in 2006. Robotic-assisted surgical systems were first placed in Corewell Health's downtown facilities, Butterworth and Blodgett. Today, Corewell Health has 13 robotic surgical systems at its Grand Rapids surgery sites—19 when regional hospitals are included—with plans to acquire two more.

By 2017, with three da Vinci systems operating across Corewell Health's Grand Rapids facilities, the leadership team had yet to assess whether they'd seen a return on their investment. Once they dug into their data that year, "sure enough, we saw our outcomes were better," shares Todd Cooper, robotics program manager at Corewell Health.

From shortened LOS to fewer SSIs, data indicated robotics was where Corewell Health needed to focus its time, energy, and finances. To the surprise of some leaders—considering the investment in RAS systems—data revealed positive margins on these procedures. "At that point, we decided to expand robotics," adds Cooper.

"We've seen LOS shortened, fewer SSIs, and conversions to an open incision pretty much cut in half when RAS approaches are tried first."

Todd Cooper
Robotics Program Manager
Corewell Health

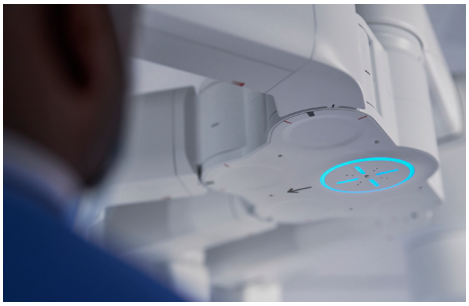
Access and scheduling challenges emerge

While Corewell Health's investment in robotics improved surgical outcomes, challenges arose. Growing demand for MIS through RAS led to scheduling inefficiencies for lower-acuity procedures, limited OR access for higher-acuity cases, and bottlenecks in inpatient throughput.

Dr. Gabriel Gallardo, who began performing surgery with da Vinci in 2017, encountered these challenges firsthand. Joining Corewell Health in 2018, he was an early adopter of a robotics-first approach. Drawn to the technology for its ergonomic benefits and ability to simplify procedures like hernia repairs, cholecystectomies, and appendectomies, Dr. Gallardo embraced robotics.

For Dr. Gallardo, RAS makes complex cases more manageable and helps avoid open surgeries. In theory, this should have increased the volume of MIS. However, ineffective scheduling and limited OR availability led to access challenges. In response, Dr. Gallardo became a strong advocate for increasing surgical volume and improving efficiency.

An early contributing factor to these challenges was that the RAS systems were often "held captive" in rooms used for non-RAS cases within the hospital's main OR. "The robotic-assisted surgical systems were pushed into the corner [of the OR] while other cases were going on," shares Cooper. Even with scheduling optimizations like "robot blocks," access issues persisted.



Changes had to be made to improve access

Corewell Health's hospital facilities became overwhelmed with outpatient procedures. These cases consumed valuable OR time that could have been allocated to higher-acuity cases, explains Cooper, leading to high patient wait times.

Corewell Health began gradually shifting surgery blocks from the hospital to its Lake Drive ASC, supported by an on-site da Vinci X® surgical system, to offset outpatient caseloads. The goal of relocating lower-acuity cases to the outpatient setting was to reduce patient wait times and expand RAS access.

In 2020, the COVID-19 pandemic further strained Corewell Health's hospital facilities, which required increased capacity for higher-acuity and complex procedures, leading the hospital to prioritize sending more outpatient cases to ambulatory settings.

Fast-forward to 2024: While Butterworth and Blodgett Hospitals still perform the highest volume of RAS, **Lake Drive ASC now ranks third in RAS volume across the region.**

Solutions and interventions

Da Vinci systems at the ASC enabled the team to deliver the right care in the right setting.

Providing favorable care

"When the first da Vinci system was placed at Lake Drive, everyone was excited," says Pamela Davis, instrument coordinator at Corewell Health. Unlike larger hospitals, where scale can dilute team dynamics, the smaller team size at the ASC fostered closer collaboration and improved efficiency in adopting the new technology.

"The nature of healthcare has swung to a heavy focus on the ambulatory center."

Brett Pfeiffle
Nurse Manager Surgical Services
Corewell Health

Once the ASC gained access to a robotic surgical system, surgeons also began preferring the outpatient setting to hospitals. "Having a da Vinci system in our ASC is a draw for surgeons," says Cooper. And not only existing surgeons.

New surgeons coming out of residencies—trained in robotics—actively seek out RAS programs. "That was another impetus for us placing da Vinci systems at these sites—to attract new surgeons," Cooper explains.

Expanding access for patients

Adding a da Vinci Xi system to the ASC setting makes it easier for patients to access minimally invasive care. Due to transportation limitations, traveling to downtown hubs can be burdensome for many patients. Accessible sites like ASCs provide quicker, simpler, less anxiety-producing care.

You don't have to drive downtown into busy, larger cities or worry about parking, which can be intimidating, especially for seniors, explains Brett Pfeiffle, BSN, RN, CNOR, a nurse manager at Corewell Health. "The simpler you make it, the better for everyone."

With a da Vinci Xi system on-site, patients also have greater access to procedures that previously had limitations in ASC settings. For example, laparoscopic ventral hernia repairs due to their technically challenging nature,

often produced suboptimal results, explains Dr. Gallardo, sometimes even requiring conversion to open surgery mid-procedure.

"Robotic technology addresses limitations," says Dr. Gallardo, explaining how robotics makes complex procedures like these more feasible, expanding the use of MIS.

Multiplying efficiencies

Leadership recognized that having an RAS system in an outpatient center made it possible for the hospital to accept more higher-acuity patients and complex procedures.

"The da Vinci system is outperforming what we do laparoscopically and definitely over open incision procedures," says Cooper. "Once we saw the volume of cases we could handle with a robotic system at the ASC, we added a second one in 2022."

The second RAS system (the da Vinci Xi) was purchased through a traditional business plan, backed by sufficient case volume and a strong track record to justify the investment. Cooper estimates that 6% to 8% of laparoscopic surgery volume will convert to RAS when a new da Vinci system is added.

Barriers to implementation

Leveraging da Vinci systems in the ASC setting enhanced access and efficiency, but achieving optimal performance required strategic planning and execution, effective stakeholder engagement, and continuous evaluation to achieve sustainability improvements in minimally invasive surgical care. With this mindset, they addressed several challenges along the way.

Allocating space: Lake Drive overcame space challenges by selecting two ORs as dedicated RAS rooms based on size and layout. Other specialties (such as orthopedics) were assigned to different rooms to ensure efficient RAS rooms for patient access.

Managing surgeon apprehension: Dr. Gallardo explains that surgeons can be apprehensive about transitioning from laparoscopic to robotic surgery, as it takes time to build efficiency. More experienced surgeons often face a steeper learning curve when adapting to robotics, can be discouraging. To Dr. Gallardo, this underscored leadership's responsibility to normalize the technology's use and drive momentum among surgeons.

Navigating staff learning curves: Leaders at Lake Drive turned the staff's initial lack of knowledge about RAS systems into a positive learning opportunity, fostering enthusiasm for the new technology. They encouraged excitement with messages like, "You get to learn this new, great, fancy technology," and, "This will benefit our patients and community." This approach ensured the system was well received from the start, recalls Pfeiffle.

Optimizing resources: Lake Drive's robotics program had to adapt to meet growing demands and navigate talent shortages. Initially, two scrub techs and an RN pursued FA training, leading to a "robotic float pool" that assigned FAs based on RAS case needs. Over time, each site transitioned to dedicated FAs.

To further improve efficiency and address staffing challenges, Lake Drive later moved to a setup with an FA and circulator for RAS cases, replacing the previous model that included a scrub tech. This transition reframed the FA role as an expanded responsibility rather than managing dual tasks. The outpatient robotics program became a key selling point for nurses and scrub techs considering the FA path.

Balancing budgets and expectations: Hospital procedures typically have higher margins due to higher reimbursement amounts in the inpatient setting. Moving cases to the ASC initially meant taking a slight financial hit, says Cooper, but it also created an opportunity to backfill higher-acuity hospital patients over time. To continue addressing surgeon demand for RAS access moving forward, hospital leadership is developing a 10-year roadmap for RAS needs, explains Cooper, including adding a formal budget for new da Vinci systems and replacements, which was previously not earmarked.

Best practices to drive more efficiency

To Pfeiffle, aligning with the future of healthcare requires shifting focus away from purely laparoscopic approaches to robotics, transitioning more patients from inpatient to outpatient settings, and equipping outpatient facilities with RAS systems.

Further best practices include:

- **Formal training:** Training is essential to implementing robotics in any setting, including ASC, says Dr. Gallardo. Effective training should address all levels, from staff to leadership, to ensure everyone is aligned. Dr. Gallardo also urges that training be treated as part of regular work, not as extracurricular tasks.
- **Operational alignment:** To improve access and efficiency, staffing, facilities, and equipment must grow at the same pace to prevent bottlenecks or delay access to MIS, says Dr. Gallardo.
- **Combined procedures:** Dr. Gallardo points to the effectiveness of combined MIS. This collaborative approach can potentially reduce surgical time, minimize recovery periods, and decrease the physical toll on patients by consolidating multiple procedures into a single procedure and anesthesia session.
- **Group choreography:** Corewell Health focuses on instrument choreography and peer comparisons among surgeons to improve proficiency. Cooper explains how, as a competitive group, surgeons don't want to be seen as outliers. These comparisons have helped surgeons align their practices over time, improving efficiency.
- **Mentorship:** To Dr. Gallardo, surgeon mentorship plays a key role in driving efficiency with robotics. "Supporting a new surgeon learning RAS, including having an experienced partner available during cases to assist, creates a safety net and fosters confidence," he says. The same principle of mentorship extends to the entire team, be it surgeon to surgeon or scrub tech to scrub tech, adds Dr. Gallardo.
- **Periodic reviews:** Regular evaluations during the first six months or year of implementation of a new da Vinci system will help identify and address any challenges, ensuring smooth adoption of the new technology, says Dr. Gallardo.

"Hospital leadership have a more proactive approach, and making plans in advance is encouraged versus being reactionary ... our robotics program has benefited from that methodology."

Brett Pfeiffle
Nurse Manager Surgical Services
Corewell Health

- **Intuitive resources:** Partnering with Intuitive also drives efficiency. "Our Intuitive rep was here for every single case in the beginning, and they're always willing to run right over," says Davis. "Intuitive reps have been great partners in this journey, and that has made all the difference," adds Pfeiffle. "It can be a challenge being an outlying facility without the rescue support hospitals have. Sometimes, the only lifeline you have is the rep, and we feel grateful to have good coverage here."

Impact

Significant benefits have been experienced—by both patients and providers—thanks to the implementation of the da Vinci systems at Corewell Health's ASC, including:

"Surgeon and patient feedback is extremely positive in our ASC setting; larger institutions quite often do not rank as well as our OR turnover times and patient likelihood to recommend metrics."

Brett Pfeiffle
Nurse Manager Surgical Services
Corewell Health

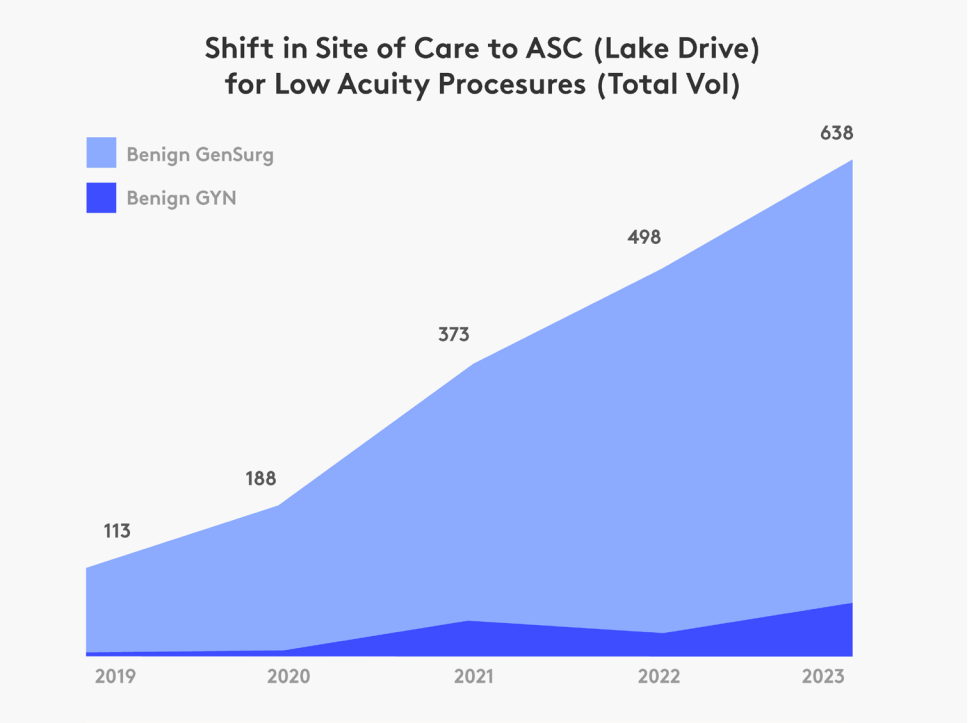
- **Increased surgical access**
- **Improved patient outcomes**
- **Expanded health equity**
- **Optimized site of care**
- **Higher team satisfaction**
- **Maximized cost savings**
- **Surgical volume and revenue growth**

With **less resource utilization** and **shorter LOS,** Corewell Health is on a path to becoming **a more sustainable health system** and **broadening access to MIS for patients** in the Grand Rapids community.

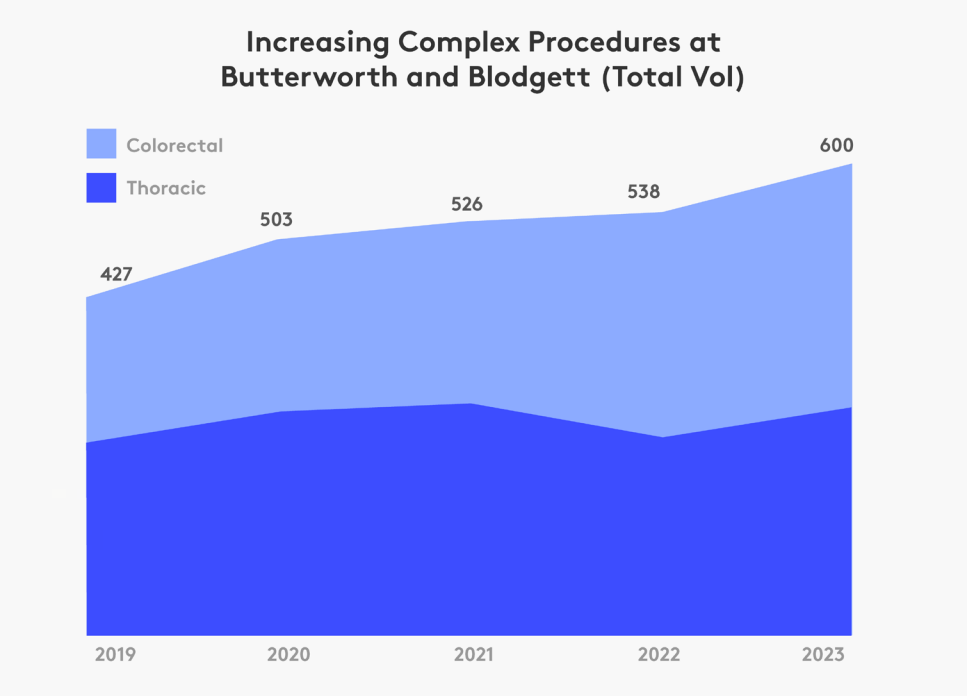
These improvements make their vision of a future where health is simple, affordable, equitable, and exceptional well within their grasp. Further data breaks down the impact of RAS in the ASC setting.

Increased access to MIS

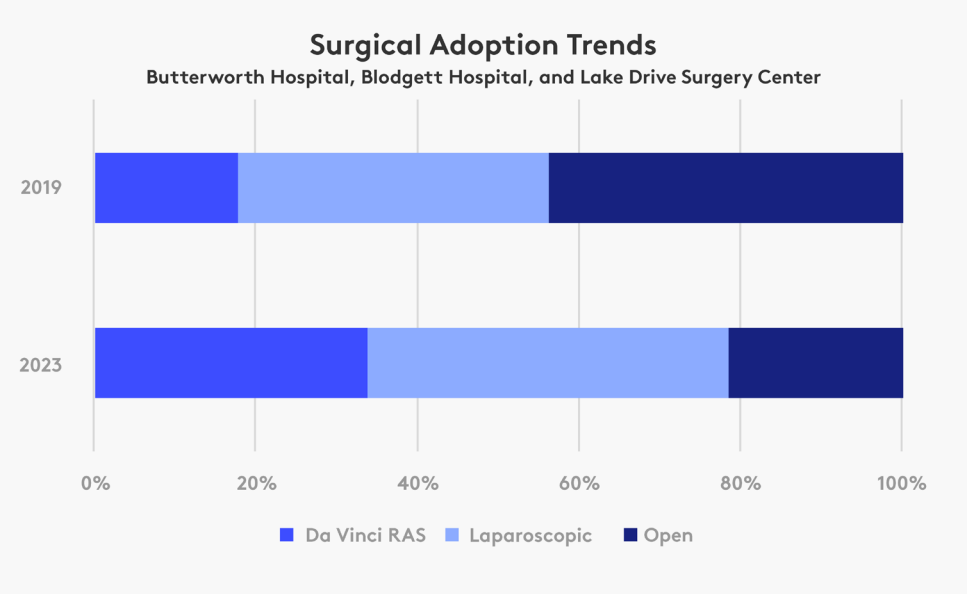
Corewell Health's Lake Drive ASC has seen **a significant increase in lower-acuity da Vinci procedures** in benign general surgery and gynecology since 2019, with procedure volume increasing by 460% over four years.



As a result, Corewell Health expanded access to higher acuity da Vinci procedures, such as colorectal and thoracic. At two of their primary inpatient facilities, Butterworth and Blodgett, procedure volumes grew by 40% over four years.



In addition to growing da Vinci procedures, the increased capacity and access provided by Corewell's strategy helped to enable growth in total surgical volume and expanded access to MIS for patients in Grand Rapids. Total surgical volume grew 16% compounded annually from 2019 to 2023 within Butterworth, Blodgett, and Lake Drive. Over the same period, the proportion of surgeries performed with an open technique decreased from 48% to 20%, driven largely by the increase in da Vinci adoption over this time period.



Expanded patient access

Adding da Vinci systems to smaller locations outside of major downtown hospitals **brought in more people** who might not have robotics access, says Pfeiffle, who sometimes saw people drive three to five hours to access Lake Drive's services.

The availability of more robotic surgical systems also helped **reduce patient waiting** times, notes Dr. Gallardo.

Improved patient outcomes

Clinical outcomes weren't just maintained at the outpatient center when compared to inpatient; they were improved.

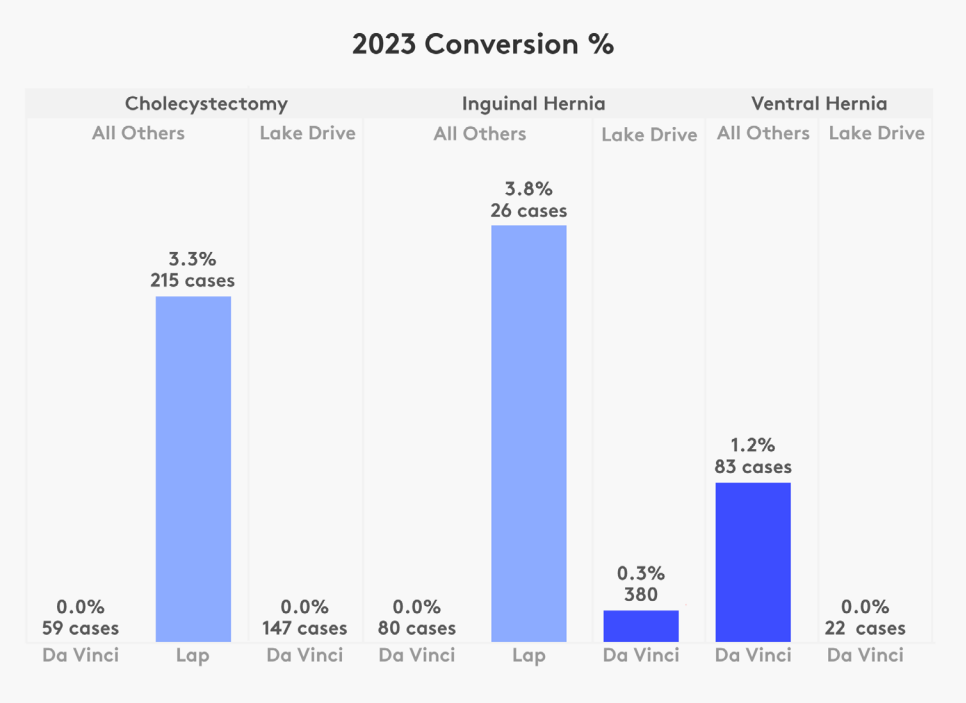
Patient outcomes were significantly better for colon and rectal resections when leveraging the da Vinci system, including shorter LOS, lower SSI rates, and decreased conversion rate to open surgery.

Colorectal Outcome	RAS	LAP	OPEN	RAS v. LAP p-value	RAS v. OPEN p-value
Hospital Length of Stay	4.7 days	13.0 days**	9.7 days**	<0.001	<0.001
Surgical Site Infections	0%	2.2%	8% **	0.083	0.007
Conversion rates to Open	3.7%	8.8%	n/a	0.070	n/a

** Statistically significant, not case matched
*Discharge year = 2023

Given that open techniques increase the risks and complications for patients, avoiding conversion to open surgeries is imperative.

The da Vinci systems consistently outperformed laparoscopic surgery at Lake Drive with a **0% conversion rate for cholecystectomy, inguinal hernia, and ventral hernia repairs.**



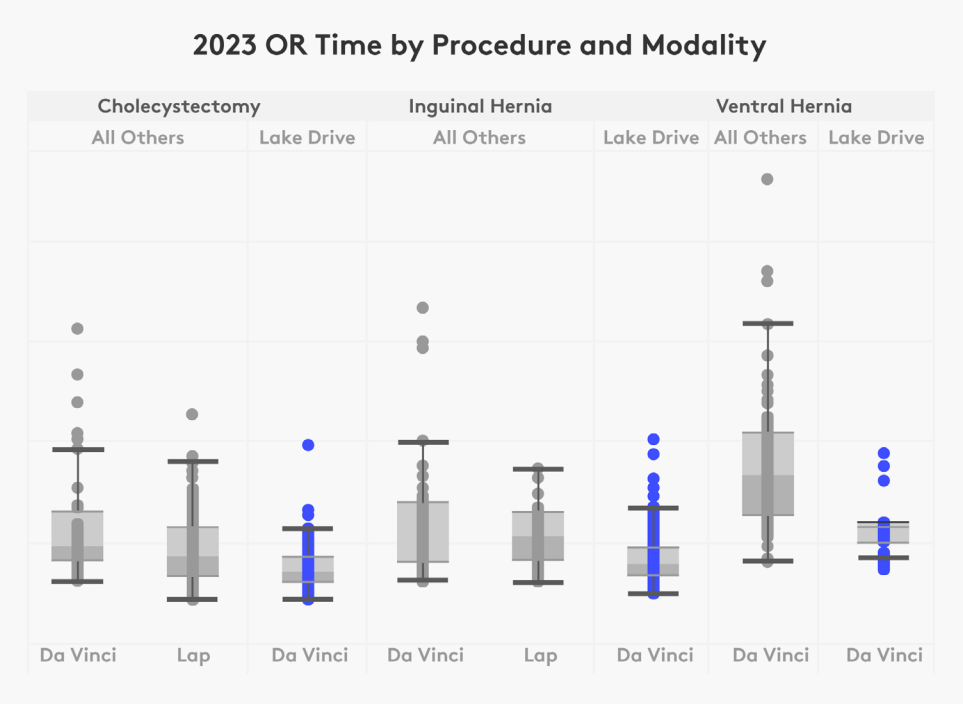
Overall, the increased adoption of da Vinci systems at Butterworth and Blodgett for **colorectal surgery and lung resection** led to a total of **807 open procedures** avoided at the two hospitals between 2019 and 2023.

Open procedures avoided (2019–2023) (CR, lung resection, thymectomy)

Hospital Name	Open Procedures Avoided	Open Adoption	dV Adoption	Lap Adoption
Butterworth	327	-11%	+7%	+4%
Blodgett	480	-8%	+27%	-19%

Optimized site of care

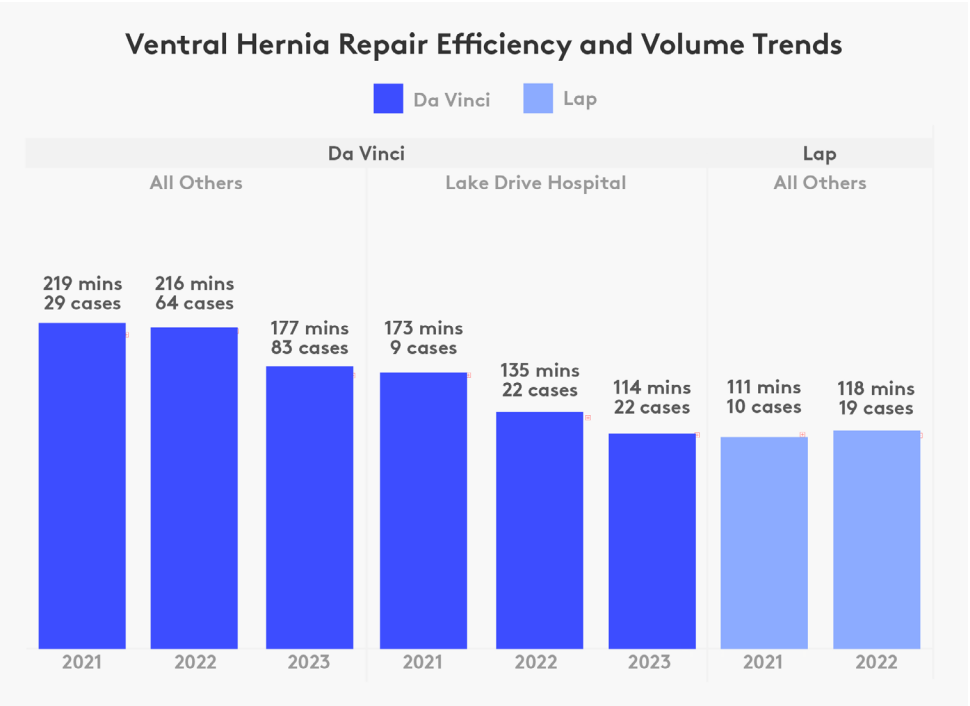
Data indicates that Lake Drive shows less variation in OR times for minimally invasive procedures, such as cholecystectomy, inguinal hernia, and ventral hernia repairs, than Corewell Health's main hospitals, suggesting **optimized efficiency.**



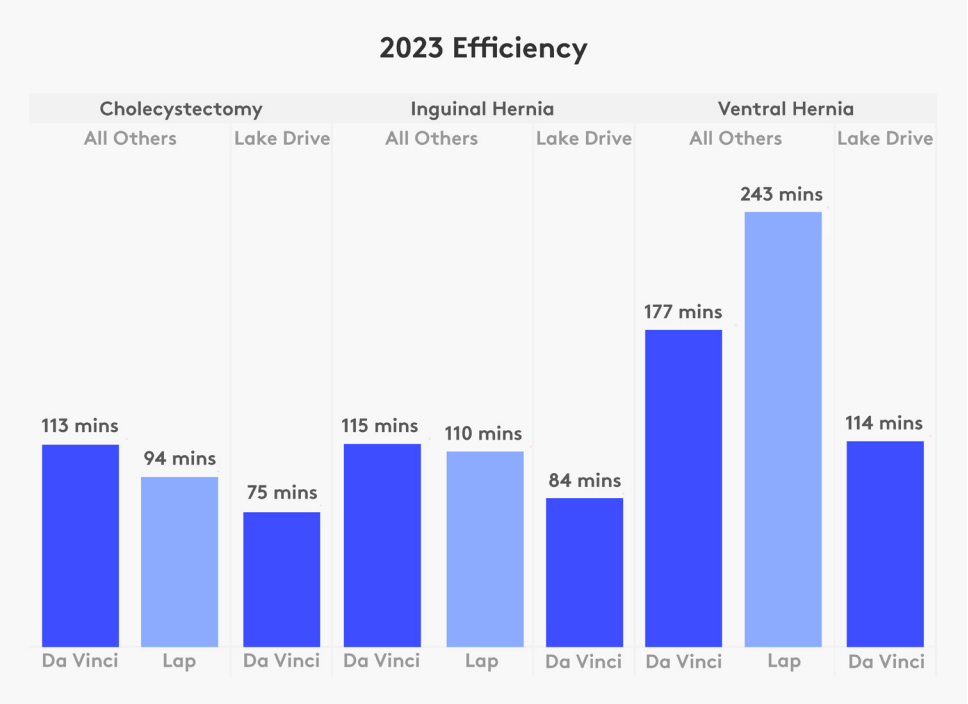
*Discharge year = 2023

Lake Drive ASC also saw **higher efficiency in ventral hernia repairs** using the da Vinci system.

As the program has matured, OR times for RAS with da Vinci at ASC have continued to come down, reduced from 173 minutes in 2021 (across 9 cases) to just 114 minutes in 2023 (across 22 cases).



Based on time spent in the OR, Lake Drive also **outperformed Corewell Health's main hospitals and laparoscopic procedures** for cholecystectomy, inguinal hernia repair, and ventral hernia repair using the da Vinci system.

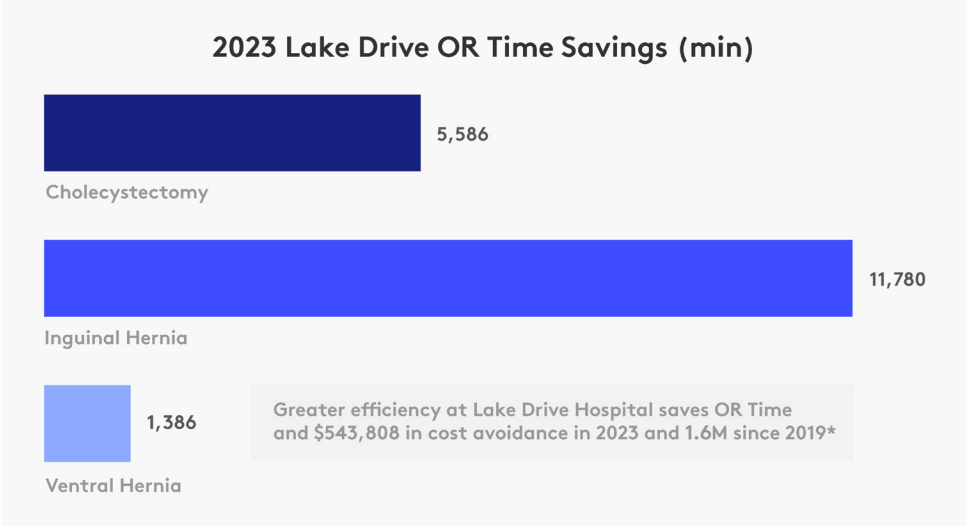


Financial Sustainability

Overall, Corewell's strategy created capacity for an additional 1,101 high-acuity inpatients from 2019 to 2023, resulting in **~$5.6M in additional revenue**.[1] By optimizing the site of care, Corewell successfully decanted low-acuity procedures to a lower cost setting and backfilled that capacity with more profitable high-acuity procedures.

Over the course of 2023, Lake Drive ASC **saved 18,752 minutes in its OR** across three procedures: cholecystectomy, inguinal hernia repair, and ventral hernia repair.

The time saved translated into **$543,808 in savings**.



*Savings based on $29/OR min. Data on File at Intuitive. 2019 Premier Data Analysis.

1. Based on Medicare reimbursement weighted average payment, excluding small bowel resection.

Procedures utilizing the da Vinci system saw **higher payouts** than laparoscopic and open techniques for benign general surgery and gynecological procedures. While costs for RAS systems are higher, the ASC setting at Lake Drive demonstrates operational efficiency, with reduced direct costs compared to other facilities for some procedures. This is an area of opportunity moving forward.

Because of the program's success in West Michigan, Corewell Health recently purchased a da Vinci 5® for one of the flagship hospitals in East Michigan. The investment allows them to transfer one of their older da Vinci systems to an outpatient center in the Detroit area. This initiative is the first of this kind in this area, partly due to the success seen at Grand Rapids. Further enhancements await Grand Rapids, too. "The way the volumes are continuing to climb, I could see even more adoption of RAS as the standard of care," says Cooper.

"There's no way we could ever go back."

This data comparison is not case matched for patient complexity and/or disease status and may not be comparable across these surgical modalities. The data analysis has not been peer-reviewed and published. Data presented here may or may not be reproducible and is not generalizable.

Dr. Gabriel Gallardo, MD
General Surgeon
Corewell Health

Dr. Gabriel Gallardo is a board-certified general surgeon with Corewell Health. Dr. Gallardo earned his medical degree from the Latin American School of Medicine in Havana, Cuba, and completed his general surgery residency at Michigan State University. His clinical interests include gastrointestinal surgery, complex ventral hernia repairs, diagnostic upper and lower endoscopy, and both laparoscopic and robotic surgery. Dr. Gallardo is dedicated to improving patient care and expanding access to advanced surgical treatments in outpatient and ambulatory settings.

Todd Cooper, BSN, RN
Robotics Program Manager
Corewell Health

Todd Cooper serves as the robotics program manager for Corewell Health, overseeing da Vinci® surgery programs across the health system, which spans 21 hospitals and more than 300 outpatient locations in Michigan. Cooper has been a champion of robotic surgery innovation since 2017 and has more than 25 years of healthcare experience, including leadership roles in surgical services and service line management. His background as a registered nurse, coupled with his business and community leadership experience, makes him a respected voice in advancing outpatient and inpatient robotic surgery strategies.

Brett Pfeiffle, BSN, RN, CNOR
Surgical Services Nurse Manager
Corewell Health

Brett Pfeiffle is the nurse manager of surgical services at Corewell Health's ambulatory surgery centers, where he oversees operations at the Lake Drive and South Pavilion locations. With more than 20 years of experience in surgical services, including more than 15 years in leadership and more than five years managing robotics programs, Pfeiffle brings operational expertise and a passion for advancing minimally invasive and robotic surgery in the outpatient setting.

Financial disclosure
The independent institution and its represented physicians quoted in this study have not received compensation from Intuitive for consulting and/or educational services.

Physician/hospital disclosure
The material presented represents the views and opinions of independent institutions and physicians based on their practice and personal experience performing RAS with the da Vinci surgical system. Their experience may or may not be reproducible and is not generalizable.

Important safety information
Serious complications may occur in any surgery, including da Vinci surgery, up to and including death. Serious risks include, but are not limited to, injury to tissues and organs and conversion to other surgical techniques which could result in a longer operative time and/or increased complications. For summary of the risks associated with surgery refer to www.intuitive.com/safety.

For product intended use and/or indications for use, risks, cautions, and warnings and full prescribing information, refer to the associated user manual(s) or visit https://manuals.intuitivesurgical.com/market.

Individual outcomes may depend on a number of factors—including but not limited to—patient characteristics, disease characteristics, and/or surgeon experience.

Da Vinci Xi/X system precaution statement
The demonstration of safety and effectiveness for the representative specific procedures did not include evaluation of outcomes related to the treatment of cancer (overall survival, disease-free survival, local recurrence), except for radical prostatectomy which was evaluated for overall survival, or treatment of the patient's underlying disease/condition. Device usage
in all surgical procedures should be guided by the clinical judgment of an adequately trained surgeon.

"Corewell Health recognizes that the direction is going to robotics, and they're aiming to be a leader and a destination of excellence for minimally invasive surgeries."

Brett Pfeiffle
Nurse Manager Surgical Services
Corewell Health

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