INTUITIVE

Case Study: Driving Volume and Value Through Site-of-Care Strategies

Community Health Network, Inc., Indianapolis, Indiana

Hospital
Community Hospital North (CHN)

Hospital bed size
348

Ambulatory surgery center (ASC)
Community Surgery Center North

Challenge

Community Health Network (Community) was experiencing inpatient bed capacity and throughput challenges at Community Hospital North (CHN), which spilled into surgical patient flow and OR access.

Community had an active, growing robotic surgery program with six da Vinci® systems located at four hospitals, including Community Hospital North (CHN). To prioritize patient care, high-acuity cases had scheduling priority on CHN's da Vinci systems. Surgeons who wanted to use the system to perform lower-acuity procedures had difficulty scheduling time on the systems, reinforcing the challenges to bed capacity and patient flow through the surgical care pathway.

Solution

To address these OR and hospital challenges, Community implemented an outpatient surgery program with a da Vinci system at Community Surgery Center North (CSCN), located close to the hospital.

Outcomes

Supporting a great patient experience: The CSCN robotics program helped the hospital minimize the COVID-19 pandemic's impact by making it possible for patients to receive robotic surgery without entering the hospital. Patients surveyed gave the surgery center a 96% satisfaction rating.

Bridging clinical and financial ROI: Enabling lower-acuity surgeries to shift to the ASC increased throughput at the main hospital and expansion of its hospital-based surgery program. By 2021, the improved availability resulted in a 7% increase in hospital surgeries, including approximately 150 high-acuity cases from new surgeons in 2021.

- Surgeons who performed surgeries on the da Vinci system at CSCN also brought more than 800 nonrobotic procedures per year to the ASC.
- Shared ownership of the ASC and increased hospital surgical volume made it possible for Community to both improve revenue and extend minimally invasive surgery with da Vinci to more patients.

Satisfying physicians and care teams: Surgeons and CSCN care team staff expressed high satisfaction in being able to perform robotic procedures at the ASC.

"Minimally invasive surgery usually allows fast recovery time for patients....I'm really pleased with how fast they leave. Now I routinely tell my robotics patients that they're most likely going to leave the same day."

Sylvia Ertel, MD
Obstetrics & Gynecology

Background

"Exceptional care. Simply delivered." Community's mission is also the promise clinicians and executives make to patients. The IDN provides care through more than 200 sites and affiliates throughout Central Indiana. One way they fulfill this promise is by seeking out innovative approaches to support surgeons and expand minimally invasive care options.

Community began offering robotic surgery with da Vinci in 2005. By 2016, the IDN had six da Vinci systems in four hospitals and was performing more than 1,500 robotic surgeries a year. As more surgeons began using the da Vinci systems, scheduling challenges emerged. CHN, a busy 348-bed hospital with a robust multispecialty surgical program, saw constant demand for its da Vinci systems. Because priority-based, patient-centered scheduling gave preference to higher acuity cases, surgeons trained to use da Vinci systems for cases such as benign hysterectomies and hernia repairs found it difficult to schedule time on the systems.

In 2018, Community turned to its strategic arm, Visionary Enterprises Inc. (VEI), to explore solutions. VEI is a fully owned, for-profit subsidiary of Community that works with the IDN and affiliated physicians to improve healthcare delivery. VEI's efforts include supporting surgical program growth through joint ventures and shared ownership with surgeons and anesthesiologists in ASCs.

Dr. Sylvia Ertel, an OB/GYN who has been performing surgery on da Vinci systems since 2008, was one of the surgeons operating at CSCN, where she has performed all outpatient surgeries for many years. She was also one of the surgeons most keenly affected by difficulties in scheduling time on the da Vinci in the hospital's ORs. Her positive experience with outpatient surgery at CSCN, combined with her OR scheduling frustrations, inspired Ertel to become a vocal champion of offering robotic surgery at CSCN.

"I love the surgery center," says Ertel. "At the hospital, scheduling is more difficult. And anything can happen—a colorectal case in front of you can run longer, or an emergency case can come in. Plus, patients must transfer to the med surg unit, where nurses are busy taking care of patients who are very sick. In contrast, there are fewer patients at the surgery center, and postop care is very focused."

Dr. Indy Lane, a fellow OB/GYN, joined Ertel in advocating for a da Vinci system at CSCN. VEI's Vice President of Surgical Services, Natalie Christy, listened to their proposition. "They were challenged for time on the robots because lower-acuity cases weren't prioritized for scheduling. So, all GYN surgeons who wanted to use the da Vinci systems were competing for a small amount of time available."

Considerations

While patient access to minimally invasive care for low-acuity cases made a good argument for placing a da Vinci in the surgery center, there were other considerations that Christy and the VEI team needed to address before the idea could move forward.

Patient safety: The team needed to determine which patients and surgeries were appropriate for robotic surgery in an outpatient setting—and who could perform them. While the surgery center is located on the same campus as the hospital, as with all surgery center care, there was still a concern for access to resources in case of intraoperative complications.

Financial concerns: The proposal had to make financial sense for the surgery center, the hospital, and the larger IDN, considering operative costs and lower reimbursement rates for the surgery center.

Hospital OR volume: The IDN needed to carefully evaluate the impact of shifting surgical volume to the ASC and how it would affect the hospital's OR traffic and economics.

Christy, surgical leadership, and Intuitive came together to address the considerations and determine the viability of robotics in the ASC.

"I really think that, going forward, we're going to see more and more robots. I really think we're going to start seeing it in all the ambulatory settings. I know there are ways of making this cost effective. If it's an ambulatory setting that's already doing things straight stick laparoscopically, the robot's just going to be another tool designed to help improve outcomes for their patients."

Jon Joseph Jansen, MD
General Surgery

Determining feasibility

Intuitive brought the Community team—including Christy, Ertel, and Lane—on a site visit to a hospital outpatient department performing robotic surgery. Dr. Jon Jansen, an early pioneer of laparoscopy in general surgery, also joined the team attending the site visit. Jansen had been performing surgeries at CSCN since 1994 and was interested in finding out if robotic surgery was possible in an ambulatory setting. "I was interested in robotic surgery for hernia repair," said Jansen, "but I do most of my practice in the ambulatory setting, and I did not want to have to take my patients back into a hospital setting to use the robot for an outpatient procedure."

After the site visit brought home the feasibility of robotic surgery in an outpatient setting, the Community team began building its own vision and strategy to stretch this potential further into an ASC setting. This included analyzing the hospital's da Vinci scheduling data and determining which cases could shift to the ambulatory setting, such as lower-acuity gynecology and general surgery cases.

Another factor driving this initiative was the recognition that the hospital's main ORs had real capacity issues and far more need for the da Vinci systems than there was time available. "We needed to add something to the campus to alleviate some of that burden and move out those cases that didn't have to be done in the hospital," said Christy.

OR pressure put a strain on the hospital's bed capacity and throughput. Even before COVID-19, bed capacity for inpatient surgical patients was a consideration. "Hospital leadership welcomed ideas to create space for the surgeries and patients that had to stay in the hospital," said Christy.

2x

The ASC program attracted two times the expected case volume in the first year.

7%

The hospital's annual surgical volume rose after the ASC robotic surgery began.

Christy had data on the hospital OR and throughput issues, along with surgeon input and projected procedure volumes. The data allowed Christy to work closely with hospital and surgery center leadership to create a pro forma outlining financial impacts to the surgery center, hospital, and network. "We were able to show in the pro forma that optimizing site of care with these procedures had the potential to bring additional volume and revenue," said Christy.

With shared ownership in CSCN, shifting cases to the surgery center offered economic opportunity to the network and allowed the hospital to attract new surgeons and higher-acuity cases to backfill the procedures shifted to the surgery center.

Foreseeing operational needs

With ASCs, every minute and resource counts. The right steps and workflow are crucial to performing surgery in an economically and operationally lean setting. Knowing that robotic procedures can take a little longer than open and laparoscopic surgeries, Christy and the surgeons knew they would need to address preop, intraop, and turnover times.

With these tactics in mind, the team set out goals in a business plan to bring a da Vinci system to CSCN. The business plan accepted by Community and VEI executive leaders laid out the steps required to achieve the following goals:

- Enhance the overall patient experience
- Alleviate access issues for benign gynecology and general surgery surgeons
- Perform 150 cases in the first year at CSCN
- Complete two or more procedures per day when the da Vinci is in use
- Realize shared profitability for all CSCN owners

Implementing the plan

Shared ownership between Community and CSCN enabled the surgery center to acquire one of the network's existing da Vinci surgical systems. VEI worked out an operating lease agreement allowing CSCN to buy and move the system to the surgery center. At the end of December 2018, the surgery center learned that the system would be in place at CSCN in 30 days. The team moved fast to be ready for the center's first case, implementing steps that included:

Establish criteria: Medical staff established surgeon-credentialing standards and patient-selection criteria for procedures performed on the CSCN's da Vinci system. The boards set patient and anesthesia profiles consistent with those for laparoscopic surgeries.

Assign a dedicated operational lead: Ashlie Young, RN, was selected to lead the robotic surgery care staff team. Young worked at CSCN as a coordinator, had extensive training, and was well-versed as a robotics coordinator across multiple surgical specialties. Her experience would enable her to scale coordination, case support, and best practices as the robotics program was being built.

Select the right care team members: Shifting to robotic surgery presented a steep learning curve to OR team members—and there was a short, 30-day runway. "You're only as strong as your weakest team member," said Young, "so it was important that every team member feel invested in making the program work."

Bring in Intuitive resources: Intuitive's OR consultation team, Genesis, brought in several learning and services resources for the CSCN team to use on program aspects that included:

- Training OR staff on da Vinci system connections, draping, and instrument use, as well as communication best practices and troubleshooting.
- Performing first-case dry runs with surgeons, including docking, instrumentation setup, coordination during procedure steps, and takedown.
- Working with Young, the OR team, and instrument room staff on fast setup and room turnover, including creating da Vinci-specific accessory trays and proper system positioning for every case. The CSCN team duplicated these efforts to improve workflow efficiency in nonrobotic procedures as well.
- Optimize room turnover time by finding parallel tasks in takedown and setup.

Engage proactive surgeons: Ertel and other surgeons made sure to be in the OR room from start to finish during initial cases. The surgeons rolled up their sleeves in setup and turnover tasks, giving OR staff confidence in understanding surgeons' preferences and how they could work together to optimize case times.

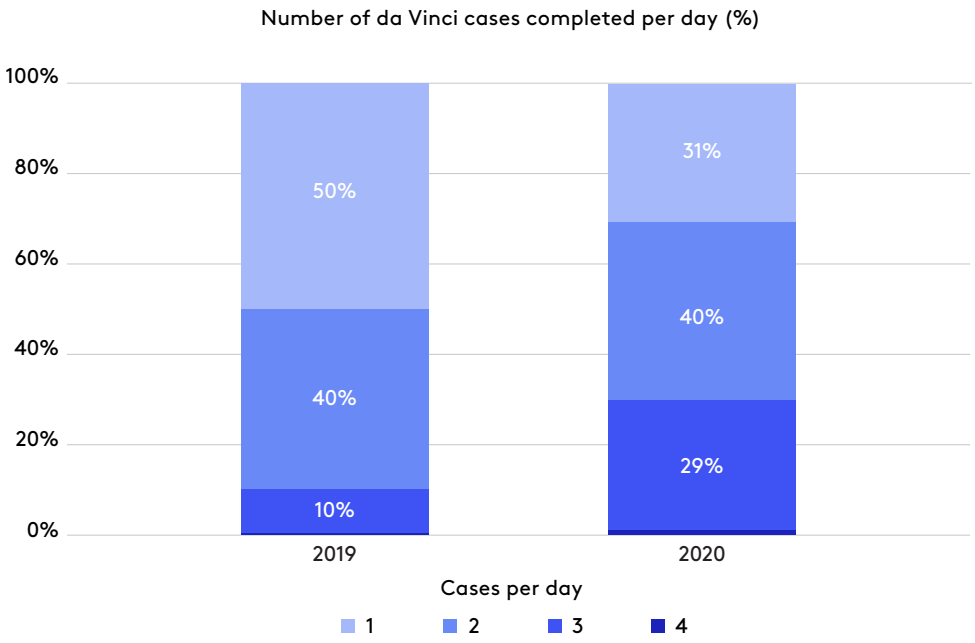
Coordinate with anesthesiologists: Surgeon and anesthesia coordination helped make the surgery shift possible, implementing protocols such as transverse abdominal pain (TAP) blockers to help with postop pain management, especially for lower abdominal procedures like hernia repairs and benign hysterectomies.

Focus on room turnover efficiency: CSCN was used to doing many nonrobotic surgery cases per day and understood that prep for the next case begins as the last one ends. The team mirrored those practices in robotic cases, also incorporating what they learned from the site visit and the Genesis team.

Getting good to get fast

Between 2019 and 2021, the surgery center team worked hard to catalyze the shift in cases to the ASC and create an efficient model for ambulatory robotic surgery. The first few months of cases went smoothly. The team was able to reduce room turnover times by 20 minutes within a relatively short time. But improving speed wasn't the team's focus. As Jansen put it, "First the nurses and techs need to get good and comfortable. Get good with the technology, get good with handling it. Start to develop muscle memory for getting the robot into position, draping the robot, getting the robot docked—to the point that it starts becoming second nature. And then then we start working on efficiencies."

Figure 1:
ASC da Vinci Cases Per Day



In the first year, CSCN performed two or more procedures per day on 50% of the days. By the start of year two, this number increased to 70% of the days.

Best practices to drive more efficiency

The CSCN team was already highly skilled at preop and postop patient care. As the number of robotic cases grew, the OR team built proficiency that allowed them to refine the intraoperative phase of the case, as well as the room setup and turnover. In its first year, the CSCN program's room turnover time was seven minutes faster than the hospital's. The surgeons, robotics coordinator, and OR team identified and reinforced best practices that included:

- **Maintaining intraoperative staffing:** The group determined that a three-person OR team ensured consistency in assigned tasks and steps of the procedure, regardless of the procedure being performed.
- **Refining coordination between OR staff and instrument room:** Scope and instrument turnover was crucial, so alignment meetings with sterilization first thing in the morning helped set expectations for the initial case and follow-on case needs.

- **Minimizing excesses:** The lead coordinator worked with the OR staff to ensure that the surgery tray only contained what surgeons would use during the case, which helped avoid costs created by supply excesses and unnecessary sterilization.
- **Reducing the number of instruments used:** As surgeons increased their case numbers, they began to find ways to reduce the number of instruments they used to perform procedures. For example, Jansen found ways to reduce instrument usage from four instruments to three when performing hernia repairs.

Achievements

The CSCN team completed more than 1,000 robotic surgeries from 2019 through 2021. By the end of 2021, CSCN's da Vinci system was being used by 17 gynecologic and general surgery surgeons. Specific program achievements include:

- **Business plan maximized:** The program attracted two times the expected case volume in the first year (300 actual vs. 150 expected). By 2021, the volume had climbed to more than 430 cases per year.
- **High utilization achieved:** In the first year, CSCN performed two or more procedures per day on 50% of the days. By the start of year two, this number increased to 70% of the days (Figure 1).
- **Improved throughput allowing incremental volume:** CHN was able to accommodate more strategic surgeons and cases in its market. This resulted in a 7% increase in surgeries, with more than 150 thoracic, colorectal/bariatrics cases per year, including nonrobotic cases as well (Figure 2).
- **Shared financial benefit:** With shared ownership, the IDN was able to realize financial benefit for each case shifted to the surgery center. And with more throughput available at the main hospital, incremental cases replaced the cases that had shifted to the ASC.

96%

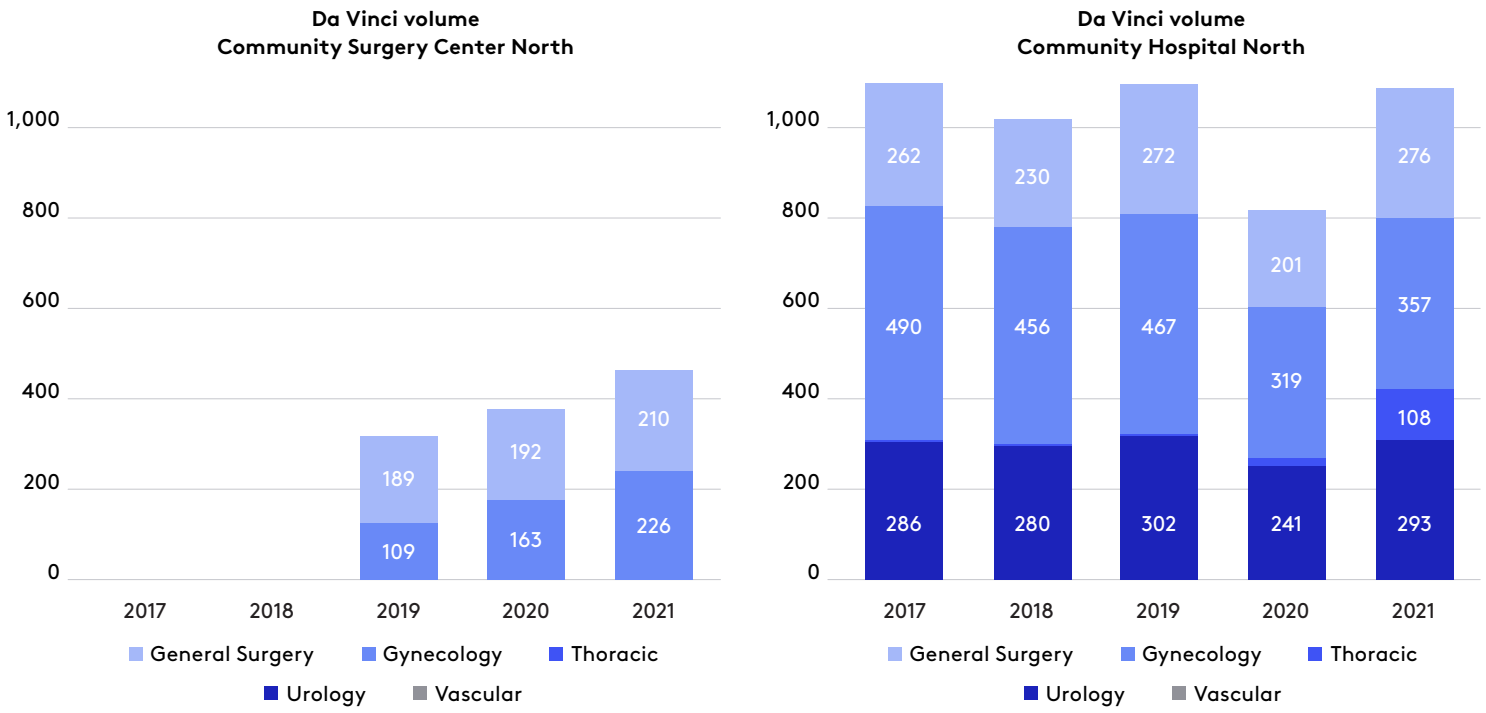
Patients reported a high satisfaction rating with CSCN services in 2021.

- **Lower patient costs:** ASC cost of care is lower than the hospital's.
- **High patient satisfaction:** In 2021, patients reported that Community delivered on its promise of "Exceptional care. Simply delivered," with a 96% satisfaction rating for services at CSCN.
- **High care team satisfaction:** Staff satisfaction with working at CSCN was above the U.S. average at 82% over the year's spanning the program's implementation.
- **Alleviation during the COVID-19 pandemic:** While many hospitals were forced to cancel robotic surgeries during pandemic surges, CSCN was able to continue serving surgical patients who met the Community criteria for outpatient surgery.
- **Nonrobotic cases halo-effect:** Surgeons who performed robotic surgery at the ASC also brought more than 800 nonrobotic procedures per year to CSCN.
- **Optimized robotic time:** Accessibility to the da Vinci system enabled surgeons to build their experience quickly, which led to reduced operative times required to effectively perform robotics at the ASC. As an example, Jansen's data from the da Vinci system showed he was able to reduce his time on the console up to 30 minutes from 2019 to 2021 (Figure 3).

Because of the program's success, Community and VEI are replicating the CSCN robotic strategy across the system, opening another surgery program with da Vinci at Hamilton Surgery Center in 2021, with others anticipated in the future.

Procedure data from Intuitive system logs.

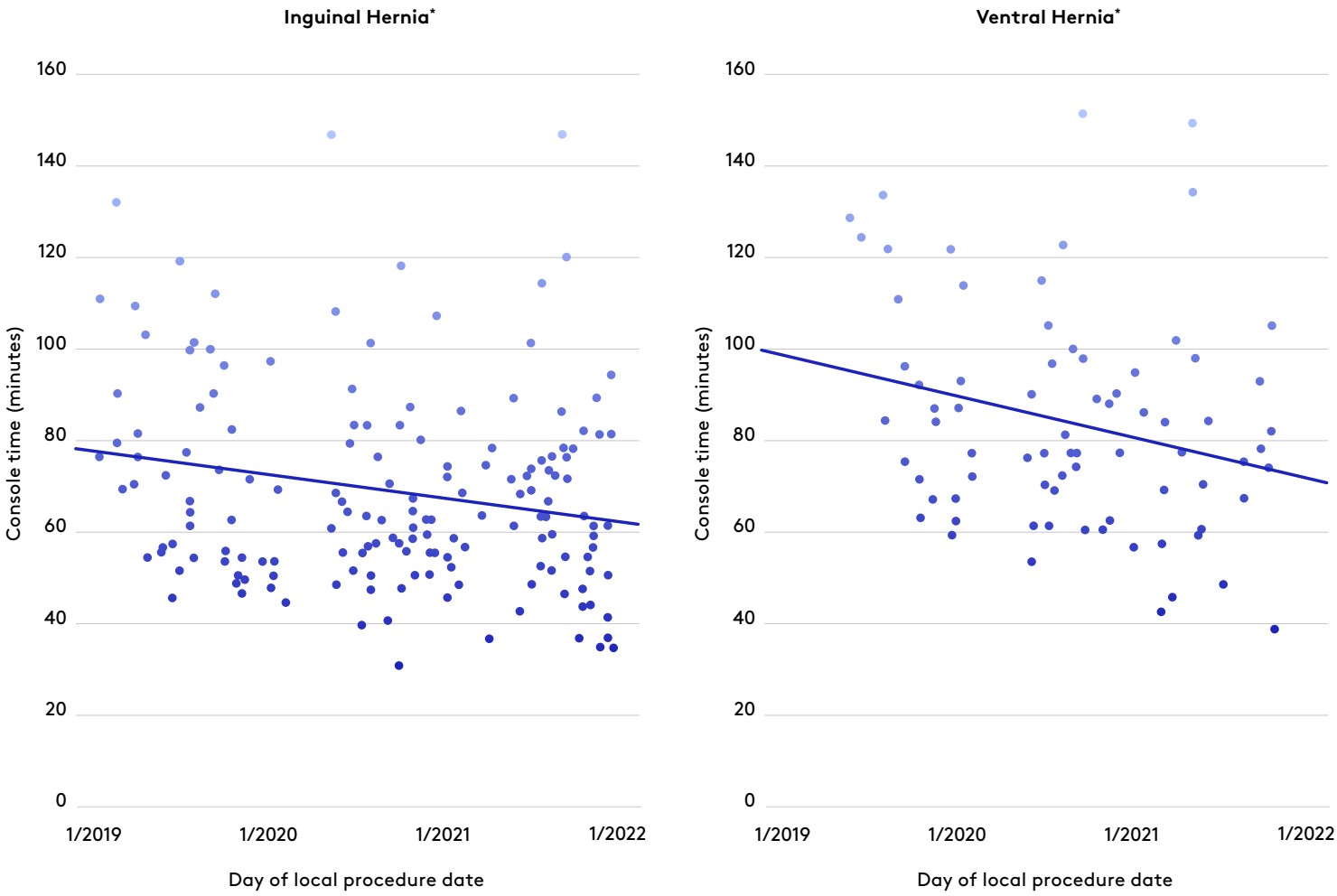
Figure 2: Surgery Volume



As robotic surgery volume at CSCN increased, CHN was able to accommodate more strategic surgeons and cases in its market.
This resulted in a 7% increase in surgeries, with more than 150 thoracic, colorectal/bariatrics cases per year, including nonrobotic cases as well.

Procedure data from Intuitive system logs.

Figure 3: Jansen Console Time



*Procedure data from Intuitive system logs.

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About

Sylvia Ertel, MD, is board certified in obstetrics and gynecology, has over 24 years of experience in the medical field, and was one of the first doctors to perform a laparoscopic hysterectomy at Community Hospital North. She graduated from New York University School of Medicine in 1998.

Jon Jansen, MD, is board certified in general surgery and treats patients of all ages. In addition to general surgery, he specializes in laparoscopic surgery and outpatient surgery, with a focus on gallbladder and hernias. He is a member of the Society of Laparoendoscopic Surgeons, American College of Surgeons, and Indianapolis Medical Society.

Natalie Christy is vice president of surgical services for VEI. Christy has served at Community Health Network since 2006, starting as a patient care technician and working as a registered nurse in the operating room. She spent several years in the OR before moving into leadership roles within VEI.

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 robotic surgery 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 surgery with a da Vinci system, up to and including death. Examples of serious or life-threatening complications, which may require prolonged and/or unexpected hospitalization and/or reoperation, include but are not limited to, one or more of the following: injury to tissues/organs, bleeding, infection, and internal scarring that can cause long-lasting dysfunction/pain.

Risks specific to minimally invasive surgery, including surgery with a da Vinci system, include but are not limited to, one or more of the following: temporary pain/nerve injury associated with positioning; a longer operative time, the need to convert to an open approach, or the need for additional or larger incision sites. Converting the procedure could result in a longer operative time, a longer time under anesthesia, and could lead to increased complications.

Contraindications applicable to the use of conventional endoscopic instruments also apply to the use of all da Vinci instruments.

For important safety information, including surgical risks and considerations, please also refer to 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).

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) 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.

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