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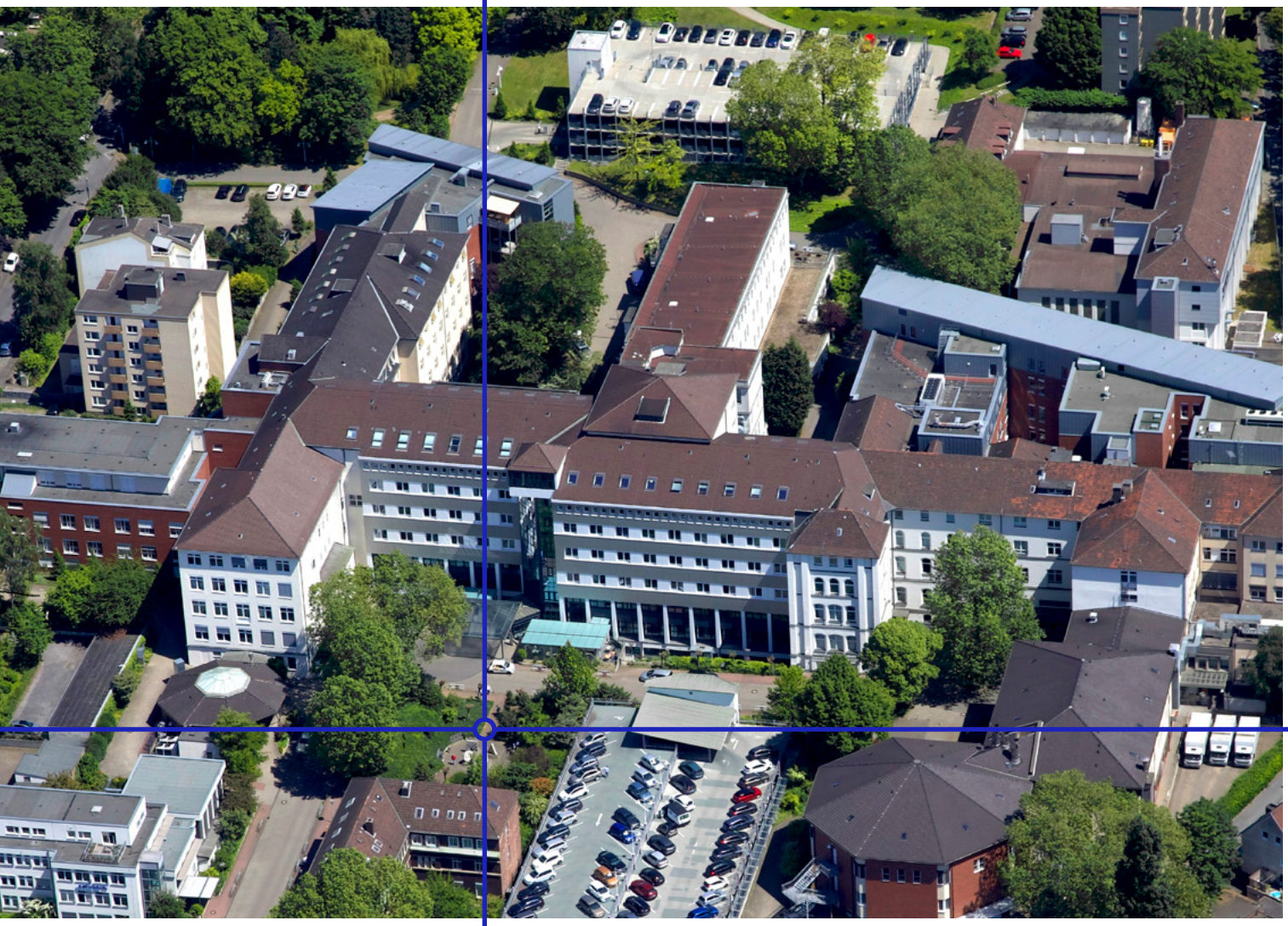


How Germany's Augusta Hospital built a pioneering da Vinci robotic assisted surgery program

INTUITIVE

CASE STUDY

Hospital

Augusta Hospital
Bochum-Mitte

Location

Bochum, Germany

Hospital beds

614 beds

Da Vinci program

- Established in 2010
- Two da Vinci X surgical systems in use
- 7,000+ da Vinci procedures (colorectal, general surgery, gynecology, urology)

Major themes

- Cancer surgery
- Benign surgery
- Technology reliability
- Care quality
- Cost effectiveness
- Industry collaboration

Background

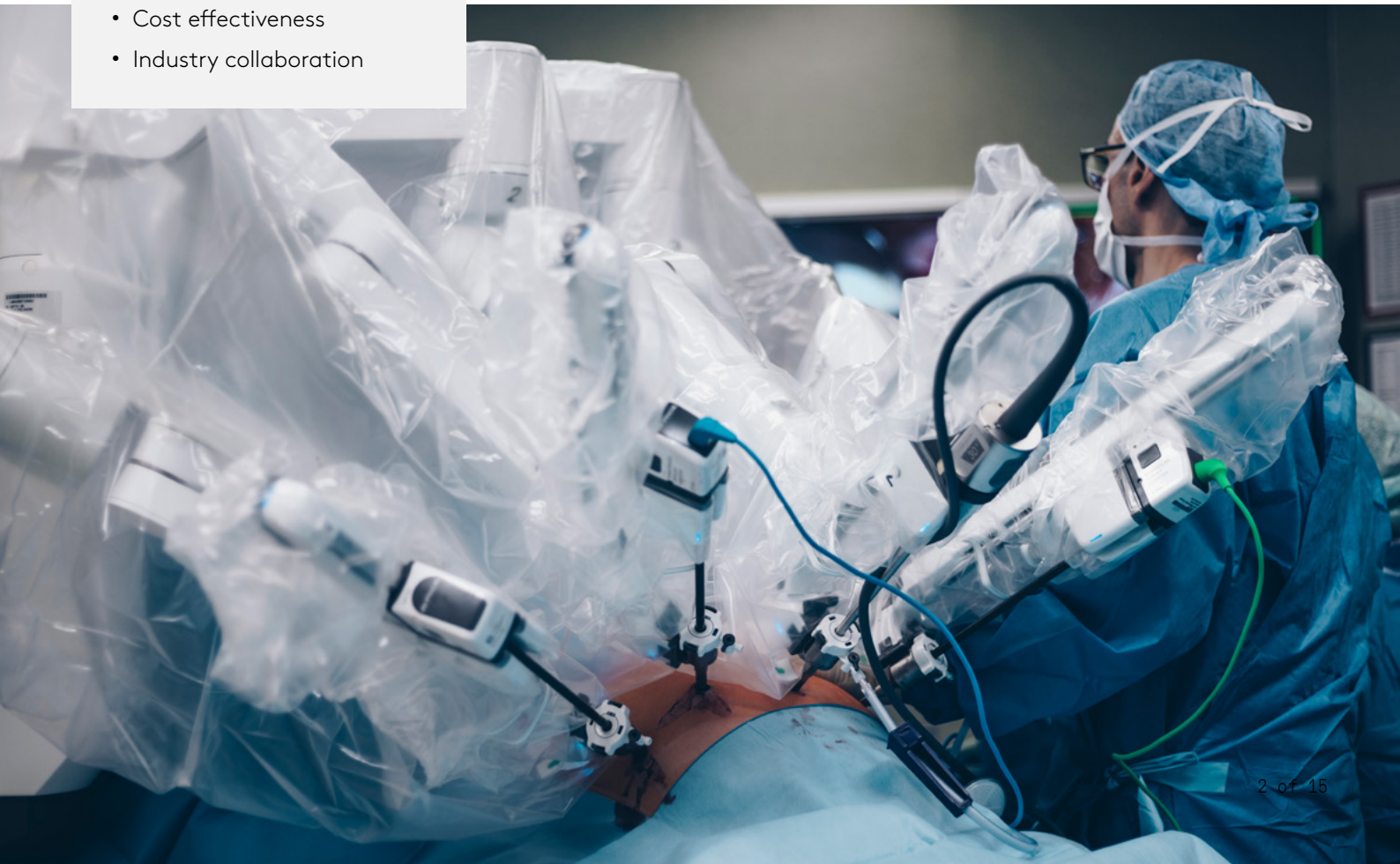
Augusta Hospital Bochum-Mitte (Augusta) is a non for Profit hospital in Bochum, Germany that's highly committed to future-oriented medicine and care.

Story

Augusta was one of the first German hospitals outside a university setting to adopt da Vinci robotic assisted surgery in 2010, beginning with urologic surgery before moving into colorectal and general surgery the same year. In 2023, the hospital began offering da Vinci surgery for gynecological conditions. Augusta has always put great importance on OR efficiency—even before the da Vinci surgery program began—an emphasis that continues today.

Key takeaways

- **Clinical** – Multidisciplinary program enabling MIS access for cancer and benign cases
- **Operational** – Highly efficient program that takes advantage of data analytics to continuously improve
- **Financial** – Proven value of da Vinci surgery across a broad spectrum of procedures
- **Strategic** – High case volume and reduced length of stay, which increased bed availability.



A 160-year history of innovating to improve patient care

The word “pioneer” conjures up images of daring adventurers. Yet many, if not most, pioneers are practical thinkers with a gift for staying open to new ideas, the ability to look beyond traditional thinking, and a healthy measure of courage. That, in a nutshell, is the character of the Augusta Hospital team and explains how it was able to create a thriving, multidisciplinary da Vinci robotic surgery program at a time when few German hospitals offered robotic-assisted surgery.

A tradition of looking ahead

Augusta Hospital was founded by the people of Bochum in 1864. The idea of a hospital founded by Bochum's citizens to serve its people remains etched in the hospital's culture today. It is echoed in the words of CEO Thomas Drathen, "Augusta attaches great importance to providing patients with the best possible care." He added, "This also includes the use of appropriate modern methods. This strategy was reinforced with the introduction of the da Vinci surgical system."

Setting a course for robotic-assisted surgery

From Augusta hospital's mission statement:
The tradition of the Augusta Hospital, a facility of the Augusta Evangelical Foundation, is the consistent orientation towards the future of medicine. Continuous progress in all areas of medicine enables the connection of new procedures for the diagnosis, prevention and treatment of diseases.

The patient who trusts the staff of this hospital can be sure that they are highly committed to future-oriented medicine and care. He can trust that all modern and established treatment methods are used and that the medical technology corresponds to the latest developments.

"Part of my negotiations with hospital management was that I was willing to start a da Vinci surgery program here," said urologic surgeon Professor Doctor Burkhard Ubrig, who came to Augusta in December 2009 and serves as chief physician of the urology clinic.

Priv. Doz. Dr. med. Benno Mann, chief physician of the clinic for general and visceral (gastrointestinal oncology) surgery, remembers Prof. Dr. med. Ubrig' s negotiations. "We were looking for a urologist who could do minimally invasive surgery, and all the candidates told us we needed a robotic system," said Mann. "The CEO at the time decided to buy the system. Two days later, he came to me and said that I needed to use it, too. It was expensive and there was no sense owning it if we didn't use it every day. I was not so convinced, because in Germany at the time, the da Vinci was really only used by urology surgeons. But I agreed to look into it."

As a urology surgeon, Ubrig didn't need convincing. He had been performing laparoscopic surgery almost daily since 2002 and believed the da Vinci system would advance minimally invasive care. "I was convinced from 2006 on that the next step to improve surgery outcomes was to use da Vinci," said Ubrig. "I strongly believed—and I do today as well—that the robotic system added decisive quality to minimally invasive surgery. I believed that I could perform minimally invasive surgery more precisely, much quicker, more safely, and more reliably with the robot. And I thought that the robot would make it possible for other surgeons on my team to do complex, minimally invasive surgeries."

Buying a da Vinci system in Germany in 2009 was a bold step, but Augusta's management felt the timing was right. Information about robotic surgery was spreading, and patients were beginning to look for da Vinci surgery, which was only available at a few German hospitals. Augusta acquired its first system, a da Vinci Si, in 2010 and quickly began integrating it into the hospital's processes.

"When we first saw the da Vinci, we were afraid," admitted OR nurse Sylvia Lewald-Nowak, who has been with the da Vinci surgery program from the beginning. "It was such a big machine," she said, "and we were afraid of making mistakes."

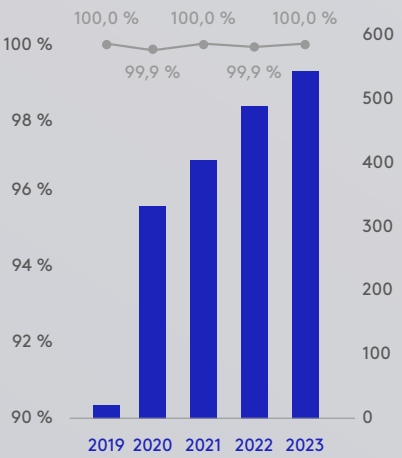
"We have been using da Vinci surgical system for 14 years plus now and our systems have always been used very intensely to the near maximum. Over all these years and all these thousands of surgeries I can hardly remember 2 events with a system down and this could be managed without the need for conversion and caused no harm to our patients. Also, the backup by clinical representatives and service personnel has been extremely reliable and helpful. All of these factors are very reassuring and contribute to us being able to offer maximum safety to our patients", says Prof. Dr. med. Ubrig.

The fear dissolved after Dagmar Busch, another OR nurse, and two surgeons, Prof. Ubrig and Dr. Heiland traveled to Ingolstadt Hospital for two days of training. "The hospital staff was very friendly and open," Sylvia Lewald-Nowak said, "and they welcomed our questions. So we immediately felt more confident. We also had an Intuitive representative with us in the OR for the first cases, which was important."

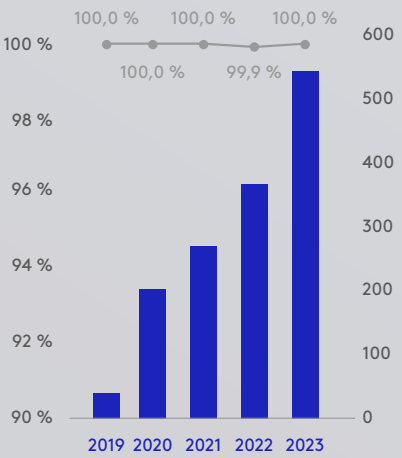
Augusta already had an active, highly efficient laparoscopic surgery program, which helped the team's transition. "We were used to watching the surgery on the monitor," said Sylvia Lewald-Nowak "and we had already learned to prepare the instruments for the surgeon's next steps. So, while the setup for robotic was different, the transition was fairly easy for us."

Ubrig agreed, "With our expertise in laparoscopic surgery, we did not have a lot of problems. We got the processes running very quickly with the help of Intuitive. And the kind of help that the company offered us was, at the time, unique. The constant presence of the clinical reps, the proctoring process, and the wet-lab training was all really helpful."

Da Vinci System X #1 Uptime
Augusta Bochum



Da Vinci System X #2 Uptime
Augusta Bochum



Da Vinci procedures

Da Vinci Uptime (%)

Overcoming challenges

Integrating a new surgical modality into the hospital's processes was not without challenges, however. "We had nurses assigned to da Vinci surgery, but they were not always available," said Ubrig, "so all nurses needed to learn to work with the da Vinci surgical system. And we needed to be sure staff understood the sterilization processes. Intuitive could not have been better, but we needed to do a lot of the work, too."

One of the biggest challenges was gaining the anesthesiologist's trust. Patient positioning with the da Vinci Si differed from open surgery or laparoscopy. Access to the patient is more limited, which made the anesthesiologists wary. "We visited other da Vinci programs with our anesthesiologists, which helped build trust," said Ubrig. "Over the years, anesthesiologists have gained so much trust in the da Vinci clinical processes that they have reduced the invasiveness of their procedures. They use fewer i.V. lines, and they don't need central i.V. lines anymore. They don't take arterial blood pressure measurements, except in special cases. That's a good thing for the patient because it's less invasive, but it also shows that there's a lot of trust in the process."

Prof. Dr. med. Burkhard Ubrig

The program also faced issues with longer operation times. "In the beginning, the da Vinci procedures took more time than open surgery and as much time as conventional laparoscopic surgery," said Ubrig. "In the early days, we sometimes overstretched our OR times, so we had to keep everyone motivated to accept this for the sake of the patients and the future. Later, with routine, we became faster with the robotic assisted surgery than with many kinds of open surgeries.

Expanding to colorectal and general surgery with da Vinci

Augusta began by offering da Vinci prostatectomies but quickly expanded to performing pyeloplasties, partial nephrectomies, and other urologic procedures. During this time, Mann traveled to observe another general surgery program using da Vinci. Though still somewhat skeptical, he thought the principles made sense. "But then when we started doing it, I was convinced quickly, very quickly," said Mann.

While urologic surgery with da Vinci was becoming acceptable in Germany when Augusta purchased its first system in 2010, colorectal da Vinci surgery was rare. "At European and international conferences, people said we were pioneers, that what we were doing was exciting," said Mann. "In Germany, it was completely different. We were told it was completely crazy. It was only in the last five or six years that all but one or two university clinics and almost all the big hospitals began using da Vinci systems in a multidisciplinary way."

Mann and Dr. Gintautas Virakas and their team began performing left-sided sigmoid rectum surgeries, which they did exclusively for the first two years before adding right hemicolectomies and gradually expanding to upper GI procedures. In 2014, the clinic began performing esophagectomies with the da Vinci, which is now the standard approach. Today, the program performs surgeries involving the full upper and lower gastrointestinal tract and biliary system.

"There's a large group of operations, such as Whipple procedure, right and left hemihepatectomies, Klatskin tumors, that are difficult and potentially dangerous with laparoscopy," said Mann. "In a lot of the cases we are doing now, it was really da Vinci that was the precondition to doing them minimally invasively,"

Dr. Metin Mazgaldzhi exploring case reports on MyIntuitive, including instruments used, case length etc. with Lars Franke from Intuitive.

Augusta began performing complex incisional hernia repairs with da Vinci in February 2022. Dr. Metin Mazgaldzhi took on the challenge of proving robotic hernia surgery's value. "Not many surgeons perform minimally invasive complex hernia repairs laparoscopically because it's difficult to access the abdominal wall. You have to stand in an awkward position for a long time, which is exhausting," said Mazgaldzhi. "With the robot, you're relaxed, you don't have pain, and you have a stable view, so you can perform the operation as long as needed. And patients have the benefits of minimally invasive surgery."

Because the two da Vinci X systems were being used until 5 p.m. daily, there was no space in the schedule for hernia surgeries. "The administration told us that if we wanted to do robotic hernia surgeries, we could do them after 5 p.m." said Mazgaldzhi. And that's what he did. "I was coming in at 7:00 a.m., doing two colorectal surgeries, and then performing hernia surgeries after 5:00 p.m. That was good for the program," he said, adding with a laugh, "but not the best thing for my family."

"We were repairing complex hernias by open surgeries, with an average hospital stay of nine days," said Mann. "When we started doing them with the robot, we reduced hospital stays to 3.5 days." Hospitals receive the same reimbursement in a defined corridor of length of stay. Reducing the number of stays freed up hospital beds to enable more surgeries. However, the reimbursement for complex hernias in Germany is very low. Using the robot for these procedures is very helpful for patients but an economical challenge for the providing hospitals. This issue will gain importance within the near future since more and more hernia repairs will be shifted towards the outpatient setting, needing less resources from hospitals to do the surgery, which will be reflected in the reimbursement.

Moving into gynecologic surgery

In 2019, Augusta moved from a single da Vinci Si system to two da Vinci X systems, which brought enhancements, such as allowing surgeons to perform stapling and sealing from the console. The new systems also made it possible to perform more urologic, colorectal, and general surgery cases, and allowed expansion into gynecologic surgery in 2023.

Dr. Matthias Losch, chief physician of the department of gynecology, was among the first surgeons in Germany to perform da Vinci gynecologic surgery in 2015. "I was enthusiastic about doing da Vinci surgery because it was better for instrument movement than laparoscopy. With da Vinci, I can move the instrument like my hand. It's also better for visualization. There were better outcomes for my patients, also more comfort for me."

Losch began performing hysterectomies and myomectomies and moved into complex surgeries, including radical hysterectomies, sacrocolpopexies, and endometriosis operations. In April 2023, he came to Augusta specifically to be part of a multidisciplinary robotic surgery program at a hospital with two da Vinci systems.

Sylvia Lewald-Nowak (Nurse), Matthias Losch (gynecologist), Ali Taibouch (Surgical Technical Assistant)

Surgeon ergonomics, procedure quality, and career longevity

The fact da Vinci systems allow surgeons to perform long, complex surgeries from a seated position has made a difference to Augusta surgeons. "One of the motivations for using the da Vinci system was that I loved the ergonomics of it," said Ubrig. "I had been doing laparoscopic surgery for seven years. And I had to have surgery for Varicosis. I had a knee problem. I had a numb finger. All because I had been doing so many surgeries in awkward positions. So, the ergonomics matter for the surgeon, but it also reflects on the quality of the surgical process. Because if the surgeon and team don't have to take on awkward positions, they can focus on surgical precision and the patient's needs."

Matthias Losch (gynecologist) at the console, with his team

Mann agrees, "I'm older than 60, and I would not be able to operate for 13 or 14 hours a day without a substantial break. It's only possible because of the robot. My shoulders and back are completely relaxed.

"It doesn't matter whether you did open or conventional laparoscopy," Mann continued, "it's a big problem. A lot of surgeons are chronically out of work because of neck and spine problems. So, the economic point of view is fantastic. We need our surgeons to perform until at least age 65, maybe 70, and we cannot afford it if surgeons are out for weeks from neck and spine issues."

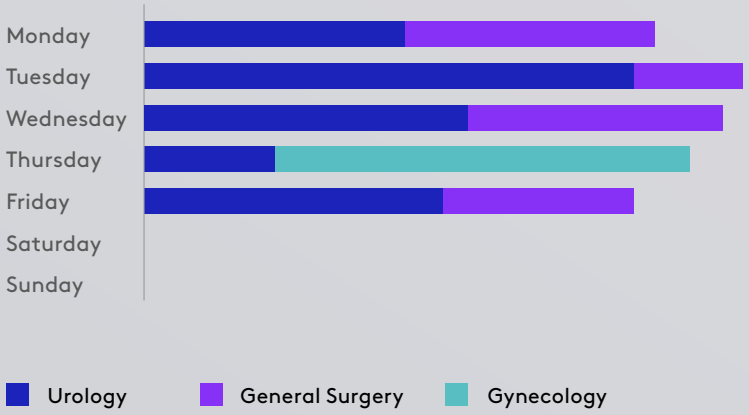
Mazgaldzhi goes even further on the importance of ergonomics. "I think in 10 or 15 years, there are not going to be many laparoscopists. It's too exhausting on your body. And with the da Vinci, it's a better quality of surgery because when I'm relaxed, I'm performing the operation more exactly, more meticulously. Plus, I'm getting better access to the structure, and I have the zoom function and the stability of the optics."

Managing a mature robotic surgery program

Intuitive does not market to patients, but patients have heard about da Vinci surgery from their doctors, friends, family, and online forums. As a result, many patients in Germany look for and ultimately choose hospitals that offer da Vinci surgery. That demand has kept Augusta's da Vinci surgery program busy enough that da Vinci surgeries run from 7:00 a.m. until 7:30 p.m. on many days. Surgeons hope for a third da Vinci system in the next year, which will help.

Another interesting finding was how well the hospital used data analytics: "Special attention is paid to the collection of key figures of operating room times. The availability of such data is usually very rare and distinguishes the OR management. These data enable the fact-based use and processing of KPIs (key performance indicators) for continuous improvement and demonstration of progress."

Da Vinci systems utilization, customer portal report
Augusta Kranken-Anstalt Bochum-Mitte, 2024 Q1



Source: Data analytics provided on My Intuitive Customer Portal, available to Intuitive Customers

"The hours make sense from an economic point of view, but it's not fun," said Mann. "And it's hard to convince consultants and trainees that one or two must be here. You need to have an extra team to accommodate the schedule."

The high demand has also put an emphasis on finding ways to increase efficiency, which is especially challenging in a hospital that was already known for its efficiency before the da Vinci program began. One action that had meaningful results was ensuring all OR staff were trained to support da Vinci surgeries.

"At the beginning, we had a dedicated da Vinci OR team," said Mrs Pia Runde, gynecology assistant doctor. "Then there was a team for urologic da Vinci surgeries and another for general surgery. Now, every OR staff member is trained in da Vinci. Of course, people have preferences, but everyone can deal with all specialties."

Sylvia Lewald-Nowak (nurse) and Pia Runde (gynecology assistant doctor)

Communication is another factor that all agree has been the key to efficiency. "It's a on going process," said Runde. "In our meetings or in the case observations, we always ask what is more efficient? If we do something different, will it be more efficient? As a team—anesthesia, surgeons, and OR staff—there's a permanent interaction and focus to become more efficient."

To ensure it was meeting its efficiency goals, the hospital engaged with Intuitive's Genesis team early on in its da Vinci program and again in September 2020. Because the Augusta team has maintained an intense focus on efficiency, the Genesis team's report made only minor recommendations to help improve inventory management and reprocessing. The OR teams earned high praise for the OR atmosphere and communication, "The Genesis team experienced a very friendly and collegial way of working in the OR. Information and instructions were communicated clearly, completely, and factually. The interface communication was always characterized by a high degree of patient safety." Augusta hospital in Bochum is among the very few Genesis reference centers in Germany and welcome hospitals from other German speaking countries to share best practices and demonstrate operational excellence.

Looking ahead

The da Vinci surgery program at Augusta is effective, efficient, and growing. When asked what could make the program better, the surgeons and OR staff could only express a strong hope for a third da Vinci system to manage the demand and allow them to perform more da Vinci surgeries.

Disclosures

The Augusta Bochum Hospital has received compensation from Intuitive for consulting services.

This material has been developed with, reviewed and approved by independent individuals who are not Intuitive employees

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