

Bronson Methodist Hospital's Rapidly Growing Robotic Surgery Program Uses State-of-the-Art Technology

By Gretchen Johnson

Three-D HD was touted as the “next gen immersive TV experience” at the Consumer Electronics Show in Las Vegas in January. At Bronson Methodist Hospital, 3-D, high-definition technology has been in place since 2008, and surgeons have been using it to perform minimally invasive surgery with the assistance of a robotic device called the da Vinci[®] S HD Surgical System. Twelve surgeons who practice at Bronson currently use the robot.

The da Vinci Surgical System, from Intuitive Surgical, is part of a rapidly growing robotic surgery program at Bronson that combines the benefits of laparoscopic surgery with enhanced graphics and motion capabilities. Its most common uses include hysterectomy, colon surgery, the treatment of gynecological cancers, prostatectomies for the treatment of prostate cancer, pediatric procedures and kidney surgeries. Bronson is the only hospital in Kalamazoo that offers

robotic surgery.

“The da Vinci system uses traditional laparoscopic instruments, held by robotic arms, under the direction of the surgeon who is at a console across the room,” explains Anna Hoekstra, M.D., M.P.H., gynecologic oncologist of the West Michigan Cancer Center. “It works with a 3-D visualization system, and it mimics the movements of the physicians’ hands and arms. It has seven degrees of freedom of movement for a more natural operating experience for the surgeon.”

Relatively new technology, the da Vinci Surgical System was the first robotic surgery system in its class when the FDA approved it for general laparoscopic surgery in the U.S. just nine years ago. For this reason, long-term studies on the device are not yet available and early research is limited.

“People who do a lot of robotic procedures believe that, as data emerges, the robotic approach will prove to be better

Brandon Rubens, M.D., and Robert Isacksen, M.D., with HealthCare Midwest Urology have been using the da Vinci Surgical System to treat prostate cancer and kidney problems.



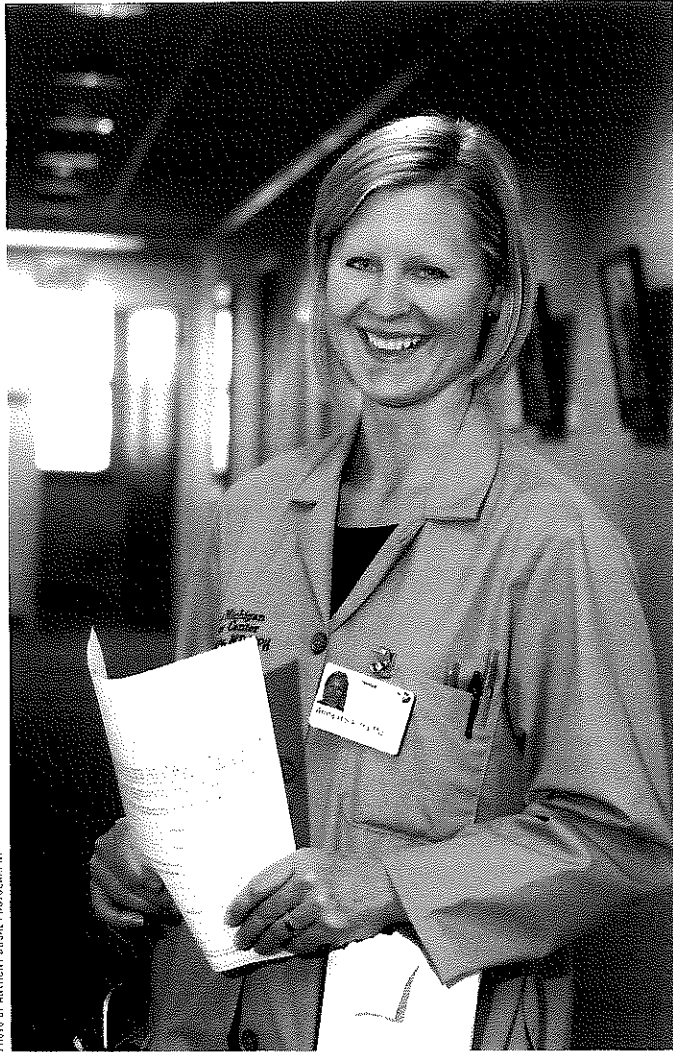


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Anna Hoekstra, M.D., M.P.H., with the West Michigan Cancer Center treats gynecologic cancers using the da Vinci Surgical System.

for preventing impotence and incontinence,” says Brandon Rubens, M.D., of HealthCare Midwest Urology, regarding the da Vinci Surgical System’s use for prostate gland removal for the treatment of prostate cancer.

In the field of urology, prostatectomies are one of the most common surgical uses for the da Vinci Surgical System. It is also effective for patients with obstructed kidneys. “Treating a ureteropelvic junction obstruction [UPJ obstruction] is significantly easier with the da Vinci because the surgery involves a lot of suturing, which can be difficult purely laparoscopically,” Dr. Rubens says. The da Vinci Surgical System is also used for radical and partial nephrectomies.

“We’re able to perform tasks such as suturing and tying knots, and it makes dissecting structures much easier,” Dr. Rubens says. “It makes laparoscopic surgery more like open surgery in that we have more range of motion with our instruments. The robot has varied instruments for specialized tasks that give us mobility like that of our own wrists and hands. Anything we can do laparoscopically is much easier with the robot.”

One of the reasons for the ease of use is the elimination of a “fulcrum effect” found in traditional laparoscopic technology, where movements are mirrored. With the da Vinci Surgical System, when you move your hand to operate, the robotic arm moves in tandem. “The surgeon can almost completely, independently, perform a surgery using the robot,” Dr. Hoekstra says. “In traditional laparoscopic surgery, there’s heavy reliance on a partner or an assistant.”

The da Vinci Surgical System looks like something from a science fiction film. It has three arms that are guided by the surgeon to perform various surgical tasks. A fourth arm is fitted with a camera and magnifies the surgical site 35 times. Sitting several feet away from the patient, the surgeon operates from a 3-D console equipped with video game controller-like instruments that mimic the body’s natural hand movements.

Compared to open surgery, benefits of robotic surgery include less blood loss and reduced trauma to the body because the incisions are smaller and tissue damage is lessened. Hospital

Physicians Who Perform Robotic Surgery at Bronson

Tempest Allen, M.D.
Bronson OB/GYN Associates

Paul Berkowitz, M.D.
Bronson Women’s Service

Michael Chen, M.D.
Colon & Rectal Surgery
Associates, PC

Anthony Gauthier, M.D.
HealthCare Midwest Urology

Anna Hoekstra, M.D.
West Michigan Cancer Center

Robert Isacksen, M.D.
HealthCare Midwest Urology

Michael Leinwand, M.D.
Bronson Pediatric Surgery
Services

Suresh Potluri, M.D.
HealthCare Midwest Urology

Joseph Riethman, M.D.
OB/GYN, PC

Zylkia Rodriguez, M.D.
Bronson Women’s Service

Brandon Rubens, M.D.
HealthCare Midwest Urology

Steven Wysong, M.D.
HealthCare Midwest General
and Vascular Surgery

Robert Isacksen, M.D., HealthCare Midwest Urology, received his medical degree from the University of Michigan. He completed his residency at Loyola University in Maywood, IL. He is board certified by the American Board of Urology in adult and pediatric urology.

Brandon Rubens, M.D., HealthCare Midwest Urology, received his medical degree from Loyola University in Maywood, IL. He completed his surgical and urology residencies at William Beaumont Hospital in Royal Oak, Michigan. He is board certified by the American Board of Urology.

Anna Hoekstra, M.D., M.P.H., West Michigan Cancer Center, received her medical degree from Rush Medical College in Chicago. She completed her residency at Advocate Illinois Masonic Medical Center and a fellowship in gynecology/oncology at Northwestern University Feinberg School of Medicine.



Tempest Allen, M.D., with Bronson OB/GYN Associates adjusts one of the da Vinci Surgical System's robotic arms as she prepares to perform a hysterectomy.

stays are shorter, and there is a quicker return to normal activity. Additional benefits vary by specialty, and as Dr. Rubens suggested, doctors have yet to see some of the outcome data. The field of gynecologic oncology has already seen published data regarding the use of the da Vinci Surgical System for surgical treatment of gynecological cancers. Dr. Hoekstra has published research regarding outcomes of robotic surgery, as well as the use of robotics in academic teaching programs in association with Northwestern University.

"In the treatment of endometrial cancer, we've studied perioperative outcome data that demonstrates improved outcomes compared to both laparoscopy and open procedures," Dr. Hoekstra says. "We're now taking that data further and studying perioperative pain. The only areas that our field is waiting for are long-term outcomes and recurrence data, to establish that there is no increase in recurrence of cancer or a worse overall survival rate from endometrial cancer and cervical cancer from robotic surgery when compared to other surgical modalities."

Common gynecologic indications for robotic surgery include endometrial cancer, cervical cancer and complicated hysterectomies. Dr. Hoekstra's research has shown other benefits when compared to traditional laparoscopic equipment, including a shorter learning curve for surgeons and a lower conversion rate to open surgery during the procedure.

Another robotic surgery advantage is its ability to enhance visualization during surgery, Dr. Rubens says. "With the robotic procedure, because we're inflating the abdomen with air, we're compressing the veins. We are able to see the tissue planes easier, and the 3-D imaging enhances that. You lose the tactile feedback from an open procedure, but the magnification and the reduced blood loss make up for it."

Robert Isacksen, M.D., Dr. Rubens' colleague at HealthCare Midwest Urology, agrees. "We're seeing the procedure in a highly magnified view and in a high-definition, 3-D image," he says. "That is as opposed to open surgery where we're looking at it from farther away in a poorly illuminated space with the problem of bleeding potentially obscuring our view."

Traditional laparoscopy provides only 2-D images. Dr. Isacksen says the typical blood loss for a robotic prostatectomy is 2 or 3 ounces. For an open surgery, the patient might typically lose 20-30 ounces.

"Reducing blood loss translates into a lower risk of requiring transfusion and, I believe, helps patients recover from surgery more quickly because they are not struggling with anemia during the recovery period," Dr. Isacksen adds.

After the robotic prostatectomy, most patients are discharged the day after surgery. This compares to a two-day hospitalization required for open surgery. "In addition, we're able to remove the urinary catheter sooner following a robotic prostatectomy, compared to the open surgery. The catheter is a source of discomfort and irritation for patients," Dr. Isacksen says. "With the robotic procedure, we can typically remove the catheter within five to seven days compared to 12-14 days for an open procedure."

Dr. Hoekstra says there are very few contraindications for patients to undergo robotic surgery. Some include pulmonary dysfunction, cardiac comorbidities and, sometimes, multiple prior surgeries associated with intra-abdominal adhesions. "Any cardiac or pulmonary indication that would prevent steep Trendelenburg positioning for several hours would exclude robotics as a surgical option," she explains.

Unlike other minimally invasive procedures, morbid obesity is not a contraindication for da Vinci Surgical System surgery.

"One of the benefits of robotic surgery over laparoscopy — and over open surgery — is that it's shown to be effective and efficient even for morbidly obese patients," Dr. Hoekstra says. "It is sometimes extremely difficult to perform laparoscopy on those patients, and the perioperative outcomes of patients undergoing robotics are better than with laparoscopy or open surgery, due to lack of wound infections and the ease of the surgery with robotics."

Dr. Isacksen, who performed his first robotic procedure at Bronson after the device was put online in March of 2008, now performs 98% of his prostatectomies using the robot.

"It's my opinion that this can lead to better results in terms of urinary control and possibly preservation of potency — although these benefits are not yet proven. As with all surgery, not all patients have a textbook recovery. Patients have to be advised of risks beforehand," Dr. Isacksen says.

Use of the robot among area surgeons continues to increase. Like Dr. Isacksen, physicians who have used the device often prefer it to other surgical options and believe it yields better results. Dr. Hoekstra says in gynecologic oncology the trend is moving away from open and laparoscopic surgery and toward robotics for the management of endometrial, cervical and some early ovarian cancers.

"I believe the surgeon's preference of this surgical modality and the positive perioperative outcomes are driving the increased use of robotics in my specialty," she says. "Besides all the benefits that we've been able to measure and publish, I think my overall gestalt is that, as a surgeon, I feel more comfortable performing procedures robotically than laparoscopically. It feels technically easier and therefore I believe it is safer for patients." ■