In

In Johns Hopkins Bayview's new operating rooms, robotic-assisted techniques are bringing surgery "back to the future"—combining the skill and dexterity of a surgeon's hands with the convenience and cosmetic advantages of laparoscopic procedures. This technology offers patients who need pelvic surgery the best of both worlds.

"There is a long tradition in gynecologic surgery of using minimally invasive options," says Victoria Handa, M.D., co-director of the Johns Hopkins Women's Center for Pelvic Health and director of the Johns Hopkins Fellowship Program in Female Pelvic Medicine and Reconstructive Surgery. "Our latest efforts are focusing on ways to adopt procedures that were traditionally performed through abdominal incision into those that can be performed laparoscopically. Robot-assisted procedures are an example of that trend."

Symptoms of uterine and vaginal prolapse:

- pelvic pressure or discomfort that decreases when lying down
- a bulge or protruding segment through the vaginal opening
- painful intercourse
- recurrent urinary tract infections
- urinary incontinence
- constipation

Since January, surgeons at Johns Hopkins Bayview have been using a robotic approach to perform certain types of pelvic procedures, including hysterectomies and sacrocolpopexy (a procedure to correct uterine or vaginal prolapse). When performing a robot-assisted procedure, the surgeon sits at a console to look at a 3-D view of the operative field and control surgical instruments via three moving arms. A fourth arm holds the camera that allows surgeons to see the 3-D images.

For patients, the robot offers all of the advantages of minimally invasive surgery—less pain, smaller incisions, less blood loss, shorter hospital stays and a potential decrease in recovery time. For physicians, it allows greater precision than laparoscopic techniques because it provides an enhanced degree of freedom in the movement of the hands and wrists.

When performing robotic-assisted sacrocolpopexy, for example, surgeons make five half-inch incisions across the waistline.

Good Hands

Robotic assistance brings pelvic surgery patients the best of both worlds

Using the robotic arms, they sew and tie synthetic mesh straps to the wall of the vagina and near the tailbone to provide support for the pelvic organs *(see illustration)*. This procedure is highly effective for women who have severe prolapse and would have traditionally required an open procedure with a five-inch abdominal incision.

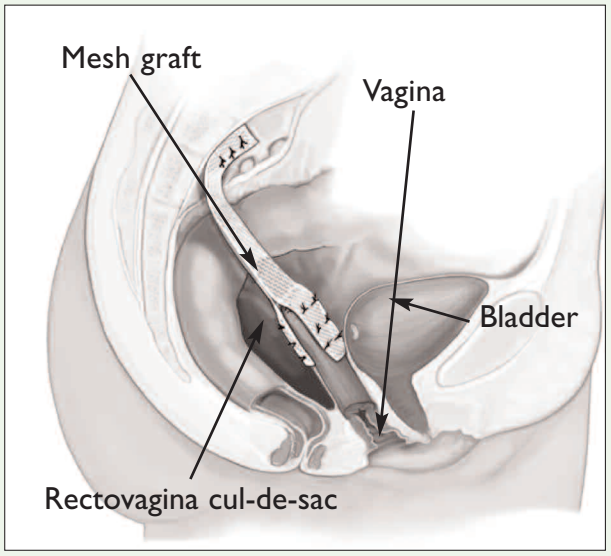
"At Johns Hopkins Bayview, we only use the robot for a narrow range of pelvic floor surgeries in which we feel it is most beneficial to patients," Dr. Handa explains. "Our surgeons already are well-established experts in performing these procedures using traditional and minimally invasive approaches. We also are fortunate to be working closely with Johns Hopkins researchers who are investigating ways to train physicians in robotic methods and most effectively integrate them into practice." *(see sidebar)*

Victoria Handa, M.D.
Co-director of the Johns Hopkins Women's Center for Pelvic Health

—Kim Fabian

Laparoscopic pelvic procedures, including those performed with the robot, may NOT be appropriate for women who:

- have a body type that makes it difficult to reach the affected area
- have a weak heart or pulmonary disease and cannot be tilted into a position with their feet above their head
- have significant scar tissue from previous procedures
- cannot tolerate general anesthesia



Side view of the female pelvis after a sacrocolpopexy. The mesh graft holds the vagina in a normal position.

Embracing Technology, Enhancing Technique

Since 1997, a team of faculty members at Johns Hopkins University's Engineering Research Center for Computer-Integrated Surgical Systems and Technology (CISST ERC) have been on a mission to significantly improve surgical technologies and training for physicians, like pelvic floor surgeon Victoria Handa, M.D. One of their current areas of focus is the surgical robot.

"This machine gives surgeons the ability to have very high dexterity and visualization in a minimally invasive approach," says Russell Taylor, professor of computer science and director of the CISST ERC. "Currently, the robot serves as an extension of the surgeon's hands. We'd like to make even more information available to the surgeon by integrating CAT scans, MRI images and ultrasound images to see beyond the surface and improve accuracy and outcomes."

CISST ERC team members work in partnership with physicians, including Dr. Handa and other surgeons, through the entire research process—from defining problems and opportunities to developing solutions that enhance the ability of a surgeon to treat patients more accurately, safely, effectively and in a less invasive fashion. They also are studying how to train surgeons to use the technology most effectively.

For more information about robotic pelvic procedures, call the Johns Hopkins Women's Center for Pelvic Health at 410-550-4406. Appointments are available at Johns Hopkins Bayview Medical Center, Johns Hopkins at White Marsh, Johns Hopkins at Green Spring Station and Johns Hopkins at Odenton.