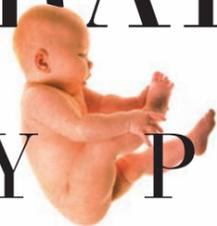


OPERATING IN TINY PLACES



WORDS BY MARYANN BRINLEY / PHOTOGRAPHS BY ANDREW HANENBERG

Painting a powerful image of his life's work, surgeon Joseph Barone, MD, says, "An infant's abdomen is about the size of a soda can. Picture what it's like trying to operate inside that soda can." This associate professor at UMDNJ-Robert Wood Johnson Medical School (RWJMS) understands all about operating in tiny places. Imagine a baby born with a congenitally blocked kidney or a child who needs a new bladder. Barone knows what it's like to use the standard, more traditional surgical approaches and tools in these cases, as well as why the robot in the operating room has made such life-saving repairs easier and more successful.

Just a few years ago, Barone and his colleagues relied upon open surgical techniques as well as endourology (using a small telescope to gain access to the urinary system) and laparoscopy (performed by passing a telescope through the abdominal wall). Since 2005, however, the daVinci robotic surgical system has put Barone and the urology group at RWJMS in the forefront of surgical innovation, "pushing the envelope," as he says, when they go inside infants and children.

A 1993 graduate of RWJMS, Barone admits, "Ten years ago, I didn't think I would be doing robotic surgery. I didn't have an interest in it but I saw the pendulum shift into robotics for adult surgery and we started applying it to pediatric cases in older children and then infants." The smallest infant he's operated on using the robot was just about 10 pounds. If he had used the old-fashioned "loop" lenses to get a clearer picture of the babies, the view would have been magnified two to three times normal. With the daVinci magnification, it was 10 times clearer. "The visualization is amazing."

Murali K. Ankem, MD, RWJMS assistant professor, and one of Barone's surgical associates,



JOSEPH BARONE, MD
ASSOCIATE PROFESSOR UMDNJ-ROBERT WOOD
JOHNSON MEDICAL SCHOOL



On Becoming a Surgeon: Practice Makes Perfect

On July 8, training medical students and physicians to become skilled robotic surgeons got easier with the arrival of the first robotic surgery simulator (RoSS™, from Simulated Surgical Systems, LLC). This training tool allows anyone to practice robotic surgery, over and over and over again. “What makes this different from a standard simulator is the ability to see the surgery site in 3D as opposed to 2D. When you do straight laparoscopic surgery, you lose depth perception. The RoSS adds that extra dimension. It’s like a flight simulator. You sit in it, look through a telescope at a 3D image of the area and practice skills like suturing, knot-tying, and tissue cutting,” RWJMS surgeon Joseph Barone, MD, says. “It also teaches you how to identify anatomic structures, keeps score, telling you how many mistakes you make as well as how proficient and accurate you are.”

RWJMS was the first medical school in the country to obtain a RoSS, with funding from the Blanche and Irving Laurie Foundation and the Karma Foundation through the Robert Wood Johnson University Hospital Foundation. “We worked out an agreement to be first,” Barone says. Before RoSS, training to use the da Vinci robotic surgical system, the only one approved by the U.S. Food and Drug Administration (FDA), had to be done in one-day sessions right at the manufacturer. “Taking a course of just six to eight hours doesn’t mean you are competent enough to go into the operating room,” Barone explains. “Studies have shown that it might take 20 or more cases before an attending surgeon becomes comfortable performing robotic surgery so this is a way to shorten that learning curve. Our goal is to provide our medical students and residents with opportunities to practice – multiple times.”

The da Vinci robot is being used for gynecologic, chest, urologic and general surgeries. Barone, who believes that it’s not practical or cost-effective to learn on the actual da Vinci system, would also like to offer the simulator to physicians in the community who could potentially use it for training and credentialing. “There are no national standards now for earning your credentials to do robotic surgery except for that one day at the manufacturer.” Hospitals could also test their surgeons’ competency on the robot by having them perform a series of tasks before they are given robotic privileges. “It takes a lot of time to become proficient on the robot.”



MURALI ANKEM, MD
ASSISTANT PROFESSOR UMDNJ-ROBERT
WOOD JOHNSON MEDICAL SCHOOL

also often sits at that da Vinci robotic platform console for delicate procedures in the operating room. Ankem doesn’t hesitate a second to point out the robot’s many advantages:

“The instruments used in straight laparoscopic surgery don’t bend. There is no angulation at the wrist. But the robotic wrist has six degrees of freedom. It is very facile, intuitive and it will bend better than your own human wrist.”

A surgeon like Ankem is physically located a short distance away from the actual patient during a procedure but always in complete control. “This robot does not act independently but is 100 percent under the control of the surgeon. You cut and reconstruct with precision and it’s all done in three dimensions” (3D). Suturing, Ankem explains, especially in a child, is remarkable because stitches are six times smaller than regular sutures, done with 3D visualization and magnified 10 times, which takes the reconstruction part to a unique level of accuracy. “The results are just excellent,” Barone adds.

These surgeons report that patients come from New York and Pennsylvania as well as New Jersey. “We’ve created new bladders with the robot, done kidney and ureteral reconstructions as well as taken out kidney or parts of them. Basically any surgery where you need to enter the abdomen in an open fashion can be done with the robot.” Barone recalls a child who was born with a congenital problem that caused incontinence. “This is a pretty challenging type of robotic surgery. We took his appendix, connected one end up to the belly button and the other end to the bladder, to create a conduit for the child so he would no longer leak urine. It was pretty exciting.” Children with urinary tract problems like this one can be kept in diapers

when they are little but once they reach school age, the incontinence becomes really difficult socially as well as physically. “A child is looked down upon in school for being incontinent and even adults don’t always know how to deal with it,” Barone says.

Ankem, who started his medical journey back in India at Ranga Medical College, did his urology fellowship in Australia and also trained at Madison Medical School at the University (with Ankem). He is passionate about the value of robotic surgery. “Most of the pain from any surgery comes from those big incisions,” he says. “The incisions we do inside the body are not really painful at all. The pain comes from cutting the muscles and sewing them together.” He believes that minimal incisions or keyhole surgery offer the best outcomes for patients and is happy when he can tell people that, after their procedures, they will need only three or four band-aids. There won’t be any 10 inch incision site. “Patients heal faster, go home quicker, use less pain medication and the surgery, overall, is medically superior.”

This team is now working towards single-site surgery which will require only one, small incision in the belly button. Together, Barone and Ankem have done approximately 25 cases using only one incision and they hope to adapt the approach using the da Vinci to a single port entry. “Right now when you do robotic surgery, you need to make four or five little incisions to put the robotic instruments in. In the very near future, we’ll just use the belly button and leave a nearly invisible scar.”

Since last summer, with the arrival at RWJMS of the first robotic surgery simulator (RoSS™, from Simulated Surgical Systems, LLC) for training purposes, the team is positioned for even more innovation. (See “On Becoming a Surgeon: Practice Makes Perfect.”) “What I find exciting is that we are one of the few centers in the country using robotic surgery in children. This is a far better way to do surgery on children and it’s going to catch on nationwide.” ■