

THE RISE OF ROBOTICS

by Jamie Loveland

Almost a decade ago, surgeons at UPMC began looking for better ways outside of minimally invasive surgery to achieve the same kind of results as a traditional open approach for patients. They learned they could use robotic surgery to perform complex procedures. Robotic surgery is a computer-assisted surgery that uses state-of-the-art technology to allow surgeons to perform surgeries through small incisions with additional precision and control.

Over the next several years, UPMC surgeons published various high-profile articles showing that the robotic surgery approach is just as safe and feasible as traditional open surgery for that of the liver and pancreas. Robotic surgery was quickly adopted by other clinical specialties, and today, UPMC is one of the largest centers for robotic-assisted surgery in the United States.

The implementation of new technologies has always posed a challenge for physicians in every specialty. With robotic surgery, UPMC surgeons have found that the learning curve is quite steep, with considerations ranging from mastery of the basics of camera and clutch control to advanced aspects including suturing and needle driving. "Taking that length of time to learn these surgical techniques was not satisfactory," said Herbert J. Zeh III, MD, chief, Division of Gastrointestinal (GI) Surgical Oncology, UPMC CancerCenter; co-director, UPMC Pancreatic Cancer Center; co-director, UPCI GI Oncology Program.

UPMC surgeons set out to develop a program that could teach other surgeons across the country and internationally how to learn techniques using a robot within a shorter period of time. In 2014, the UPMC Center for Advanced Robotics Training (CART) was formed to do just that.

"Surgeons learn best when they have a comprehensive program. We wanted to create a mechanism by which we could more confidently train surgeons and in turn, give them the confidence to adopt these skills and translate them into their own clinical practices," said Umamaheswar Duvvuri, MD, PhD, director, Head and Neck Robotic Surgery.

Currently, the CART program is available in multiple specialties including Ear Nose and Throat (ENT) surgery, thoracic surgery, surgical oncology, and cardiac surgery.

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Hands-On Learning

The intensive, hands-on course provides surgical teams training both on-site at UPMC facilities and virtually. From Florida to California, China to Belgium and the Netherlands, surgeons from all over the world have participated in the program.

CART provides participating surgeons and their support staff with expertise through personalized pathways, much like private lessons in robotics. The program has two components; one to introduce surgeons to robotic surgery who have no prior experience and the second to help those with robotics experience to refine their skills.

Using a simulator, participating surgeons learn to use the robot much like pilots learn to fly. As they practice, the simulator gathers data which helps to track the surgeon's progress and determine how many more cases they may need before they move to the next step of the training program. Surgeons also practice by sewing on artificial organs or cadavers and then progress to watching video clips compiled from various surgical cases. Lastly, the training moves to the bedside, where surgeons are proctored and mentored by UPMC experts.

“The care of the surgical patient is so important, because there is so little room for error. The days have passed where physicians are learning on patients. That's not acceptable anymore. CART is providing physicians with an opportunity to work directly with our experts to take their skills to the next level,” said Dr. Duvvuri.

Engagement between participating surgeons and program experts continues long after the program has ended. UPMC experts are readily available to address questions and review cases for participating surgeons; trainees are also able to return to UPMC to sit-in on additional surgeries at any time. In some cases, UPMC experts will travel to other institutions to proctor surgeries, conduct lectures, and provide additional training.

Training the Whole Team

Though CART is focused on providing surgeons the necessary technical skills, an added benefit is the emphasis it places upon training surgical assistants and operating room nurses.

“Robotic surgery is a very intricate process. Someone is managing the patient and you also have the robot itself. Having someone who is familiar and able to navigate between the two is critical. I go over the entire robotic system with the surgical staff — from pushing the power button on the robot to docking it and I explain how all of the different pieces work together,” said Jennifer Bonfili, BSN, RN, Robotics Clinician.

Emergency planning is also critical. UPMC operating room nurses review with the surgical teams what to do if there is an emergency and how to go from doing a surgery robotically to a traditional surgery should the situation arise.

CART is a classic example of improving quality of care by facilitating improved training for our own physicians, nurses, and trainees. Surgeons, nurses, residents, and fellows across a number of different specialties within UPMC are currently participating in the CART program to help give our own patients the best possible, cutting-edge care they deserve.

A Paradigm Shift

Technology is always changing and there will always be new surgical devices and techniques. CART is leading the way when it comes to changing how surgeons think about incorporating new technology into practice.

Experts at UPMC want CART to serve as a prototype for the way surgeons are trained. In being able to track the progress of trainees coming through the program, UPMC experts hope this will show the tangible impact the program has on decreasing learning curves, heightening awareness of the culture of safety, and helping to reduce complication rates.

“We want CART to serve as a paradigm for the way we train surgeons. We don't want surgeons to go back to trying to learn this on their own in the OR. Instead, this program should serve as a laboratory for how we train surgeons, both UPMC surgeons and surgeons from around the world.” said Dr. Zeh.