

Robotic Surgical Simulator

Lends a Guiding Hand to Surgeons

By Sharon Glazer



Drs. Neal Seymour and John Romanelli agree that the use of telerobotics in surgery will continue to advance.

Baystate Medical Center's newly acquired Robotic Surgical Simulator (RoSS) is a training system that uses virtual reality to closely approximate the look and feel of the *da Vinci* surgical robot.

RoSS teaches the body position, hand articulation, foot movement and coordination, and robotic field visualization required to perform robot-assisted surgery. Neal Seymour, MD, vice chair of the Department of Surgery and chief of General Surgery, notes that it doesn't teach all the skills needed to operate the complex robot, but says, "It's amazing how much like using the *da Vinci* console it is."

Surgeons at Baystate Medical Center have been performing robot-assisted minimally invasive surgery using the *da Vinci* system since its acquisition in 2005. The medical center obtained a newer, second-generation *da Vinci* system in 2008.

"Robot-assisted surgery pushes the envelope of what we can accomplish, especially in urology and gynecologic oncology," says John Romanelli, MD, FACS, director of Bariatric and Robotic Surgery. "We can offer minimally invasive procedures for more patients with a wider variety of problems."

How it Works

Surgical procedure modules like RoSS that use Hands-on Surgical Training (HoST) software, immerse the trainee in a virtual surgical scenario based on a real case performed by a master surgeon.

HoST guides the trainee through complex motions by giving performance feedback in the form of tactile sensations. The software operates like a checklist, only advancing to the next step when the current step is done correctly.

RoSS comes with a Basic Skills module that teaches skills such as tissue cutting and fourth arm manipulation, and a Basic Orientation module that develops competence in synchronous camera and arm movement, and proficient use of dominant and non-dominant hands. It also has a metrics tool that evaluates performance so that surgeons can track their progress.

“Having this training system places us as the top location in New England for surgical residency programs,” says Dr. Seymour, who also serves as director of the Baystate Simulation Center and Goldberg Surgical Skills Lab. “Only a handful of residency programs across the country allow residents to participate in robotic surgery, and we are the only ones in New England.”

There is a growing need to train surgeons to perform robot-assisted surgery. “This will give Baystate residents considering fellowships involving robotic surgery a leg up on their competition,” adds Dr. Seymour.

Validating RoSS Training

Baystate was able to procure the tenth RoSS manufactured through collaboration with RoSS developers, the Center for Robotic Surgery at Roswell Park Cancer Institute in Buffalo, and the University of Buffalo’s School of Engineering and Applied Sciences. Because of the Baystate Simulation Center’s reputation for making major contributions in the field of virtual reality devices and hybrid computer-driven simulators, RoSS developers approached Dr. Seymour to coordinate a multi-center study to validate its use.

Dr. Seymour helped develop a protocol for evaluating the simulator’s curricula, explaining, “We’re sorting out things like: What task difficulty is most appropriate for

the learner? How long are they permitted to train in a single session? What does good performance mean? And is it a reflection of something you would predict would be valuable when the trainee goes to the operating room?”

“Having *this* training system places Baystate as the **top location** in **New England** for surgical residency programs.”

Baystate Medical Center has one of the most advanced simulation labs in the U.S. in terms of inventory of equipment and training capabilities, says Dr. Seymour. “The American College of Surgeons Education Institute Consortium has identified us as a destination-to-see for institutions interested in developing a simulation center.”

Looking Ahead

Dr. Seymour stresses that the use of robots or telemanipulation devices to perform surgery that requires great precision or maneuvers that are difficult with conventional surgical tools is now commonplace. “Great advances will be made in telerobotics in surgery,” he says.

About a dozen surgeons at Baystate currently use the hospital’s *da Vinci* robots every day for procedures as varied as gastric bypass surgery, ovarian cancer surgery, hysterectomy, prostate cancer surgery, urologic surgery, and kidney surgery.

Refer a Patient
Baystate Health Link
1-800-377-4325