Eisenhower and UCLA Partner

CUTTING-EDGE ROBOTIC SURGERY

It sounds like the stuff of science fiction — using a robot to perform surgery long-distance (what's called "telesurgery"). Yet this amazing technology already exists, and Eisenhower Medical Center — a leader in robotic-assisted surgery — is involved in cutting-edge research to advance its potential even further.

"We're working with the Center for Advanced Surgical and Interventional Technology (CASIT) at the University of California, Los Angeles (UCLA), to develop remote laparoscopic surgery between UCLA and Eisenhower Medical Center via an Internet connection," says Lance Patrick Walsh, MD, PhD, an Eisenhower Urologist and Co-Principal Investigator on this research project funded by the Telemedicine & Advanced Technology Research Center and the United States Department of Defense.

"This project has tremendous implications for how we can train surgeons in laparoscopic robotic surgery," shares Dr. Walsh. Minimally invasive, robotic-assisted surgical techniques provide significant advantages for patients, but new laparoscopic surgeons face steep learning curves, and expert mentors are concentrated in relatively few centers. With a telesurgical system like the "laparobot" being developed by UCLA and Eisenhower, however, an expert can do "telementoring"— interactively teach surgical techniques to trainees at different locations.

Telesurgery could also mean that patients one day will no longer have to travel to hospitals with sophisticated robotics surgery programs or physicians or who are robotics experts to receive the most advanced treatments. For emergency procedures, telesurgery could enable surgeons to provide immediate care to patients who might not survive a long-distance trip to a major hospital.

It is important to realize that robotic surgery does *not* put a robot at the controls. The surgeon is *always* in control of every aspect of the surgery with the assistance of the robotic surgical system, which eliminates tremor and magnifies the surgical field through a three-dimensional image. The tiny robotic instruments can make all the movements of the human hand in a very small space — greatly improving the surgeon's dexterity and range of motion compared to traditional laparoscopic surgery.

Despite being technologically advanced, however, robotic surgery still has certain limitations, Dr. Walsh notes. That's why another component of the UCLA/ Eisenhower research project holds such promise. "When doing robotic-assisted surgery, I can see the tissues

Board Certified Urologist Lance Patrick Walsh, MD, PhD, stands with the *da Vinci® S HD™* Surgical System. Dr. Walsh is working with UCLA on research to develop remote laparoscopic surgery between UCLA and Eisenhower Medical Center via an Internet connection.

I'm operating on, but there's no tactile ('haptic') feedback," he explains. "There's a technical advantage to gauging how hard or supple tissue is, to know the appropriate tension to put on the instruments when I'm dissecting or suturing."

The UCLA/Eisenhower research team is developing a tactile feedback system that can be integrated with commercial robotic surgical systems, such as the industry-leading *da Vinci®* Surgical System in use at Eisenhower. It will enable the surgeon to sense the force being applied and "feel" tissue characteristics.

"This will significantly improve the quality of surgery," explains Dr. Walsh. "In prostate cancer surgery, for example, our goal is not only to remove the tumor but also to spare surrounding nerves so the patient maintains potency and continence. Compared with traditional open surgery, robotic surgery already shows a quicker return to potency and continence."

"But, if we're able to further spare trauma to tissue, that could lead to superior outcomes, and, that's the bottom line," Dr. Walsh adds. "This research has real implications for improving patient care, and we're leading the pack in research and development of this technology."

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