USF and Simbionix to develop laparoscopic hysterectomy simulator

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$700,000 BIRD Foundation grant supports innovative collaboration

The Israeli subsidiary of Simbionix™, USA, and USF Health have received a two-year, $700,000 grant to develop a laparoscopic hysterectomy simulation module – advancing USF's momentum to build a center of excellence for computer-assisted surgical training and innovation.

The grant was awarded by the U.S.-Israeli Binational Industrial Research and Development (BIRD) Foundation, which promotes technological research and development collaborations between companies and organizations from the two countries – typically within private high-tech industries. Of the six grants recently announced by the BIRD Foundation, the grant to USF and Simbionix was the only one with participation by an academic institution.

Dr. Larry Glazerman, left, and Dr. Stuart Hart, work with the Simbionix LAP Mentor, a simulator used to teach medical students and physicians various types of laparoscopic procedures, at the USF Health Simulation Center at Tampa General Hospital.

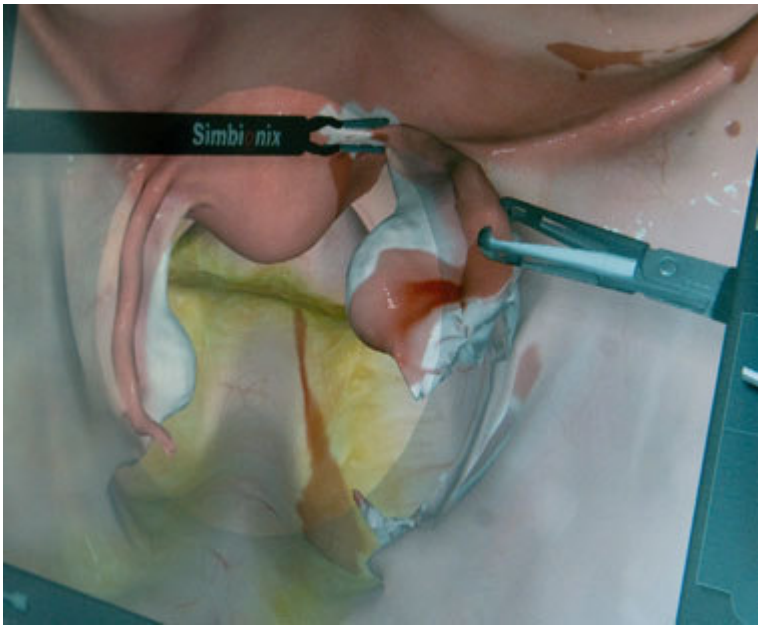
In developing the simulation training module, Simbionix Ltd. will partner with USF Health, whose College of Medicine faculty will help create the content for the module. Larry Glazerman, MD, MBA, and Stuart Hart, MD, of the USF Department of Obstetrics and Gynecology, are principal investigators for the project. USF will work closely with Sterling Williams, MD, vice president of education for the American College of Obstetrics and Gynecology, to validate content.

"The award of the BIRD grant provides a fantastic opportunity for us to work with Simbionix to develop the first laparoscopic hysterectomy simulation module for training GYN surgeons in minimally-surgery techniques," said Stephen Klasko, MD, MBA, CEO of USF Health and dean of the College of Medicine. "This project has the potential to have a huge impact on the quality of practice of gynecologists worldwide. Through us working together, our doctors, patients and the health of our communities will stand to be the winners."

Deborah Sutherland, PhD, associate vice president for Continuing Professional Development at USF Health, said the simulation model developed will be used to train both residents and practicing ob-

gyns. “We want to facilitate the cognitive and psychomotor skills needed to safely and efficiently perform laparoscopic hysterectomies,” Dr. Sutherland said. “The development of this module will be a first step in moving forward to assess and certify competence in the field.”

Engineers from Simbionix will visit USF Health to videotape faculty performing laparoscopic hysterectomies and also to observe live procedures in the operating room. “We are going to dissect the procedure down into each individual step that the engineers will then translate into the simulation,” said Dr. Glazerman, associate professor of obstetrics and gynecology and director of minimally invasive gynecologic surgery at USF Health.



The LAP Mentor's monitor depicts the user practicing removal of a fallopian tube and ovary. In simulated surgeries, the device can be programmed to cause complications, like excessive bleeding, so physicians can practice responding to the emergency in a risk-free environment.

According to the Centers for Disease Control (CDC), approximately 600,000 hysterectomies are performed yearly in the United States at a cost of nearly $5 billion. Hysterectomy, surgical removal of the uterus, is the second most common major operation in this country.

Instead of making a large abdominal incision, the physician performing laparoscopic hysterectomy is assisted by a video camera and long thin instruments inserted through tiny incisions in the abdomen. The physician uses the images from the video camera positioned inside the patient’s body to perform the procedure.

Despite laparoscopic surgery’s advantages in appropriately selected patients – less postsurgical discomfort and complications, quicker recovery times, smaller scars – obstetrics and gynecology has lagged behind other fields in adopting this minimally-invasive procedure. For instance, only 15 percent of hysterectomies are done laparoscopically compared to 95 percent of all gall bladder removals, Dr. Glazerman said. “We believe open-incision hysterectomy should be the last option instead of the first.”

Over the last decade, restrictions on residency work hours, improvements in medical management options, economic factors and ethical concerns (learning skills on patients) have led to fewer surgical cases for traditional apprenticeship training. At the same time, simulation has become more prevalent in resident training as innovative techniques have increased the types of surgeries to be learned and simulation technology continues to improve.

“Laparoscopic hysterectomy requires different skills than abdominal hysterectomy,” Dr. Glazerman said. “The bottom-line is that there’s a growing need to do a better job of training gynecologists how to do advanced laparoscopic procedures, and simulation allows risk-free repetition and

measurement of skill proficiency unavailable with conventional teaching methods."

USF Health's Dr. Hart, left, and Dr. Glazerman, principal investigator's of the BIRD Foundation grant, will collaborate with Simbionix engineers and the American College of Obstetrics and Gynecology, to develop and validate the laparoscopic hysterectomy simulation module.

Developing a laparoscopic hysterectomy simulation module that will recreate a real-world, three dimensional experience requires understanding how organs in the pelvis function in relation to one another and the integration of haptic feedback, said Dr. Hart, assistant professor of obstetrics and gynecology in the USF Health Division of Urogynecology and Pelvic Reconstructive Surgery.

Haptics are computerized tools that facilitate the sense of touch physicians experience when performing surgery. For instance, pushing the surgical instrument into the "virtual" uterus would yield the same initial give and then tension of the uterine tissue, Dr. Hart said. "It should be as close as you can get to surgery without actually being in the operating room."

Simulation training offers the advantage of allowing residents and fellows to experience and resolve unexpected complications of more complex hysterectomy cases, such as excessive bleeding or unintended damage to the bladder or bowel. "They can practice as much as needed for successful completion and must prove a level of competence before they graduate to operating on a real person," Dr. Hart said. "It all comes down to making surgery a safer experience for the patient."

Dr. Glazerman and CPD's Dr. Sutherland are founding members of the ACOG Simulations Consortium, which works nationally to develop and implement unique simulations-based curriculum as an adjunct to improve residency education and clinical competence.

Dr. Glazerman and Dr. Hart co-direct the USF Center for the Advancement of Minimally Invasive Pelvic Surgery. They helped launch and oversee the [1] Advanced Laparoscopic Gynecologic Surgery Conference, which attracts physicians from across the country twice yearly to learn the latest in minimally-invasive gynecological surgery techniques. The next conference is Oct. 9-10, 2010, at Lake Buena Vista, FL.

- Story by Anne DeLotto Baier, and photos by Eric Younghans, USF Health Communications

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