

## SURGICAL SKILLS CENTER

### Simulation Training at Stony Brook

Under the chairmanship of Todd K. Rosengart, MD, the mission of the Department of Surgery at Stony Brook University is to provide exceptional clinical care encompassing “leading edge” technologies, to serve as a first-tier educational program, and to make innovative strides in basic science and clinical research. The educational programs at Stony Brook University, the development of the Education Division within the Department of Surgery, and now the new SBUMC Surgical Skills Center play significant roles in achieving this mission.

Through the initiative and efforts of Apostolos K. Tassiopoulos, MD, the SBUMC Surgical Skills Center (SSC) was inaugurated in January 2011. The SSC is an 1800-square-foot facility located at the heart of Stony Brook University Hospital, in close proximity to clinical care areas and operating room suites. It is an ideal environment for advanced surgical education that provides opportunities for engagement in surgical activities, for pre-surgical planning, and for drop-in practice. Accessible 24/7 (via ID card access) to all residents and faculty, the SSC enables residents and medical students to practice in a stress-free environment not only surgical technical skills, but also pre-operative and post-operative patient care scenarios, thereby enhancing educational experiences in surgery.

Surgical attending faculty and staff with experience in surgical simulation education are available on a daily basis at the SSC for guidance with training modules and skills development. Currently available training modules range from **basic open skills** (eg, knot tying, suturing, IV access, central line and chest tube insertion) and **fundamental laparoscopic skills** (eg, camera navigation, controlled intracorporeal cutting, transfer drills, and laparoscopic suturing) to **advanced open surgical skills** (eg, inguinal hernia anatomy and repair, sutured and stapled intestinal anastomosis, vascular anastomosis, arterial endarterectomy and bypass, open aortic aneurysm repair) and **advanced patient care skills** (eg, advanced trauma and cardiac life support, various surgical clinical care scenarios).

Three *high-end haptic virtual reality simulators* are also available for training in laparoscopic advanced skills, laparoscopic cholecystectomy, laparoscopic colon resection, angiographic vascular anatomy, and a wide array of basic and advanced endovascular skills (eg, navigation of endovascular catheters, angioplasty, and stenting). The SSC utilizes cutting-edge audio/video technologies and software in order to maximize the utility and productivity of the activities it hosts and provide opportunities for performance review, effective debriefing, and meaningful feedback to trainees.

Our simulation curriculum focuses on the development of surgical and clinical skills early on in the training process, while the emphasis at senior levels of training is on the development of leadership skills, effective communication and collaboration, practice building skills, critical assessment of patient safety issues, and thorough understanding of systems-based problems and quality assurance protocols.

Residents are provided with protected time each Thursday morning to participate in simulation exercises. Moreover, for two months at the beginning of the academic year, surgical residents participate in weekly boot camp activities, organized by training level, that are facilitated at the SSC. This two-month surgical boot camp is particularly effective in providing incoming interns with a background in basic surgical skills, while giving more senior residents the opportunity to refresh previously acquired skills and gain, through simulation, an introduction to more advanced techniques/procedures/protocols. As our residents have found great value in participating in these boot camp sessions, the Department’s Education Division is currently working on expanding training

modules to procedural simulation and teams training, such that our simulation training program incorporates all three Phases of the ACS curriculum organized by PGY training level.

Inasmuch as the SSC is intended to serve as an effective context for clinical skill development, it is anticipated that, over time, it will enable residents and faculty to improve instructional practices through engagement in simulation activities. As the SSC becomes further established, faculty will appropriately train and prepare senior surgical residents to act as teachers/instructors. Chief residents rotating on the General Surgery, Trauma, and Vascular services will be expected to meet with more junior residents and medical students to run simulation education sessions. For their part, students and junior residents will actively participate in these sessions, providing feedback as to enhancing the experience of learning through simulation.

Under the direction of Dr. Tassiopoulos, the Vascular Division at SBUMC has taken strong initiative in the development of the SSC and has advocated for making it an integral aspect of surgical training for fellows, residents, and medical students. As the program director for the ACGME-accredited vascular fellowship and integrated residency training program, Dr. Tassiopoulos is deeply interested in exploring the many affordances that simulation education has for clinical skill development and for meeting competency-based objectives with respect to fellows, residents, and medical students.

Recognized for his work in surgical education and simulation, Dr. Tassiopoulos is currently developing research protocols that will help integrate educational research to the ongoing work of the Department of Surgery. One of the primary objectives of Dr. Tassiopoulos's work is to examine how surgical/clinical skills developed in the context of simulation transfer to the OR and to day-to-day clinical care. Along with colleagues in the Vascular Division and the Department of Surgery, Dr. Tassiopoulos begins this exploration by integrating the surgical simulation curriculum with the resident didactic/core curriculum, and by improving associated assessment methods measuring learner development overall and in specific domains of interest. Once the curriculum and assessment methodologies have been established and refined, the intention is to consider skill development in the OR and in the SSC, and how skills learned in one context migrate and contribute to learning and performance in the other.

The Division of Vascular Surgery currently houses a well-established Vascular Research Lab where investigators are involved in a number of clinical trials, including new diagnostic and therapeutic strategies for management of venous disease, optimal treatment of claudication, early detection of aortic aneurysms with novel ways of calculating rupture risk, and minimally invasive techniques for management of iatrogenic vascular trauma. The development of education research protocols will further strengthen the Department's research mission.

Surgical simulation has emerged as a training tool with enormous potential for teaching, learning, and research. The SBUMC SSC provides residents and medical students the opportunity to be a part of this rich, dynamic process, and to work collaboratively in making meaningful contributions to the field of surgical simulation education.

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