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UW Medicine

Surgery Synopsis

INSIDE:

ISIS: Improving Quality of Healthcare Through Enhanced Educational Techniques

What is ISIS?

The Institute for Simulation and Interprofessional Studies (ISIS) established in 2005 and now in its eighth year of operation, has pioneered simulation education and training at the University of Washington. The goal of ISIS is to provide leadership in the use of simulation technologies to improve the quality of healthcare education, patient safety, and outcomes. ISIS is able to accomplish this goal by bringing state-of-the-art technology and expertise under one organizational structure.

ISIS enjoys broad multi-disciplinary leadership. **Carlos A. Pellegrini, MD,** Professor and Chair, Department of Surgery, serves as the Chair of the ISIS Board of Directors and **Brian Ross, PhD, MD,** Professor in the Department of Anesthesiology, is the Executive Director. Membership of the ISIS Board includes other faculty and administration from the Department of Surgery, other School of Medicine Departments, the School of Nursing, and hospital administration. ISIS connects departments and programs throughtout UW Medicine, School of Nursing, School of Pharmacy, and the Physician's Assistant Traming Program (MEDEX). ISIS provides training in the areas of procedural and patient management skills, interprofessional education, and team communication. ISIS has established itself as a national leader in healthcare simulation training. It is endorsed by the University of Washington and was one of the first 10 simulation centers accredited as a Level I Education Institute by the American College of Surgeons (ACS).

ISIS is involved in many other programs and with other entities. For example, ISIS has extensive collaborative relationships with UW-affiliated hospitals: Seattle Children's and Valley General. In addition, ISIS has collaborative programs and ventures throughout the state, the WWAMI region, nationally and internationally.

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ISIS is a constantly evolving and growing endeavor. As medicine and technology evolve so does ISIS, though always with steadfastness to its goals. Following is a snapshot of some of the activities, programs, and research occurring in ISIS at this moment in time.

ISIS Provides Extensive Residency and Medical Student Training

ISIS has become an essential part of many residency programs at the University of Washington because of its ability to provide procedural and patient management skills training. For the Department of Surgery, ISIS serves a primary role by providing regularly scheduled skills-based courses for open, laparoscopic, and endoscopic technical skills. In addition, ISIS cadaveric training (at the Harborview facility) has dramatically expanded procedural-based teaching of UW residents by allowing learners to practice complex surgical procedures before applying them in the operating room.

ISIS began at facilities located at UW Medical Center's (UWMC) Surgery Pavilion with a 2,000 ft^2 space. It has now expanded to Harborview Medical Center's (HMC) Ninth and Jefferson Building (8,000 ft^2), and Northwest Hospital's (NWH) Community Health Education and Simulation Center (8,900 ft^2). Within these facilities ISIS is equipped with a fully configurable virtual operating room complete with surgical towers, booms, lighting, and anesthesia equipment; skills labs; computer models for laparoscopic and gasteroenterology training; and classroom/conference areas. Additionally, the ISIS-Harborview location has a nine-station wet lab space for proctored cadaveric trainings and practice. Residents, Fellows and Faculty are provided 24/7 access to the ISIS skills lab at the UWMC and HMC locations for independent training and practice.

Fully equipped virtual OR facilities allow for practice of scenario-based training in a realistic environment.

To provide perspective on the scope of ISIS training: in 2012, ISIS provided training to more than 12,000 learners (totaling over 54,000 learner hours) from over 30 departments and programs within UW Medicine and across the five-state WWAMI region (Washington, Wyoming, Alaska, Montana, and Idaho).

Residents, Fellows, and Faculty are provided 24/7 access to the ISIS Skills lab for practice.

The surgical simulation training takes students from basic to complex surgical skills. Monthly training courses for residents and medical students include: medical student introduction to Surgery Skills (knot tying, suturing), Open Surgical Skills for Residents (instrument handling, wound closure), and Vascular Surgery Skills Training (small vessel repair), among others. ISIS additionally provides access to residents completing their **E**mergency coverage, **V**acation, **A**cademic time and **T**echnical **S**kills (**EVATS**) rotation. EVATS was established by the UW Department of Surgery in 2003, and encompasses a six to eight week period of training. The Department of Surgery has developed a set of specific tasks for each skill set. During this rotation, residents are expected to devote a portion of their time to technical skills practice in ISIS.

Research and Development Activities

Like many academic simulation centers, ISIS seeks a reputation for excellence in curriculum development and delivery, but perhaps most unique to the ISIS program is its

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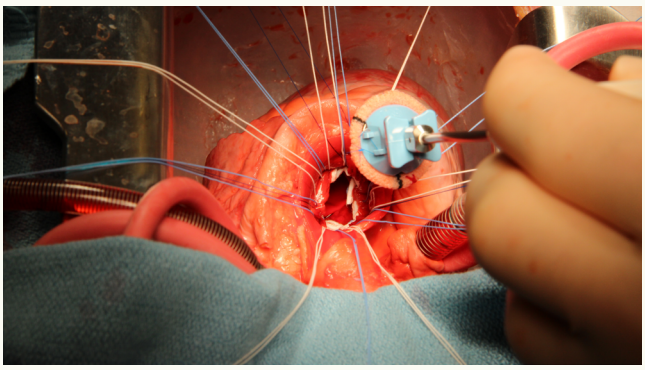
robust research and development (R&D) efforts. Co-chaired by **Mika Sinanan, MD, PhD,** Professor, General Surgery and Dr. Thomas Lendvay, Assistant Professor, Urology, Seattle Children's Hospital, the ISIS R&D Committee supports research opportunities relating to simulator and curriculum validation, skills and technology assessment, surgical robotics, and training via telemedicine and virtual environments. The resulting efforts have supported exciting innovations in team communication, as well as surgical training in robotics and cardiothoracic surgery.

Improved Patient Safety by Simulator Based Training in Cardiac Surgery

Education for cardiothoracic surgery is exceedingly complex and has traditionally been limited to on-the-job training in the OR. Training only in the OR results in increased procedure times, longer time to proficiency for learners, and potential risk to patients.

Additionally, in such a high-stakes environment, the ability to properly assess, learn, and perform a procedure is often compromised due to the stressful situations a surgeon may encounter. To mitigate these realities, **Nahush Mokadam, MD,** Associate Professor, Cardiothoracic Surgery, partnered with the Agency for Healthcare Research and Quality (AHRQ) and the University of North Carolina on the *"Improved Patient Safety by Simulator Based Training in Cardiac Surgery"* project.

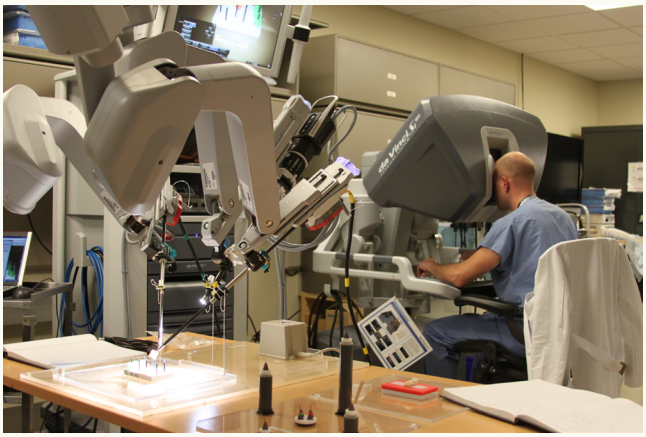


The Ramphal cardiac simulator allows learners to practice complex surgical skills using porcine tissue.

This multi-institutional pilot-study provides cardiothoracic residents and fellows the opportunity to perform and assess complex cardiac procedures in a safe learning environment. Using porcine heart muscle, the high-fidelity Ramphal Cardiac Surgery Simulator provides residents with a realistic "beating heart" model to perfect technique and practice cardiac surgical procedures. By employing competency-based simulation, as well as removing the patient from the training environment, both the speed of skill acquisition and patient safety are improved.

Virtual Reality Warm-Up for Robotic–Assisted Surgery

Simulation training has been a reliable teaching method for skills acquisition, but rarely has it been used for priming existing skills. ISIS is changing that.



A resident practices skills using the Da Vinci surgical robot.

Athletes, musicians, dancers all warm up before performances, yet surgeons do not do a formal warm-up before doing surgery. With Department of Defense (DOD) funding, Dr. Thomas Lendvay and team created a robotic surgery skills curriculum including both virtual reality and reality-based robotic surgery modules to test how surgical simulation could be used to elevate or "prime" surgeons for enhanced surgery performance. The project was one of ISIS' first collaborative efforts with Madigan Army Medical Center. Preliminary results show that subjects who warmed-up had a performance boost over those who did not warm-up prior to the assigned task.

Improving Patient Outcomes: The Central Venous Catheter Project

Research and Development efforts continue to increase patient safety throughout UW Medicine. In 2006, a consensus of hospital leadership, medical leadership, and educational experts in ISIS identified Central Venous Catheter (CVC) placement as a key focus for improving patient safety.

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UW Medicine concentrated its effort on the development of a comprehensive CVC training program, incorporating e-learning and simulated skills training into an educational model centered on improved patient outcomes. Beginning July 1, 2010, UW Medicine mandated that anyone placing a CVC line in a UWMC or HMC patient must have first successfully completed ISIS CVC testing. To date, this interdisciplinary project has trained and tested over 1,200 residents, fellows, attendings, and healthcare professionals in the Departments of Anesthesiology, Radiology, Surgery, Family Medicine and Internal Medicine. In addition to placement skills training, the online module includes training for nurses and non-MDs in central line care and management.

Since implementing the CVC training program, UW Medicine hospitals have seen a dramatic decline in central line associated blood stream infections (CLA-BSI). The program is also credited with a reduction of hospital costs (estimated at over $580,000/year), as well as improved patient outcomes and satisfaction. ISIS hopes to use the CVC program as a guide for implementing future patient safety initiatives.

A resident completes Central Line simulation testing in ISIS.

ISIS Provides Team Training

According to reports by The Joint Commission (TJC), over 70% of hospital-related deaths and sentinel events across the country are associated with communication errors. Since no surgery is performed solely by the surgeon, these deaths and events include team communication errors before, during and following surgery.

In response to these data, ISIS has dramatically increased its curriculum development efforts in interprofessional and team training. In conjunction with UWMC and HMC, ISIS is providing training and implementation support for **T**eam **S**trategies and **T**ools to **E**nhance **P**erformance and **P**atient **S**afety (**TeamSTEPPS**) across UW Medicine entities.

ISIS uses simulated scenarios to practice team communication concepts.

TeamSTEPPS was developed by the DOD and AHRQ and targets improved patient outcomes by improved communication and teamwork skills. In 2009, ISIS and the University of Washington were named by the AHRQ as a National TeamSTEPPS Training Resource Center. ISIS serves as one of only five national centers and the only center on the West Coast. Since its designation as a national center, ISIS has trained over 350 TeamSTEPPS Master Trainers from over 15 national and international hospitals, clinics and healthcare programs.

ISIS is having a major impact upon the quality of healthcare training, patient safety and outcomes and is a tremendous resource; not only to the Department of Surgery, but across disciplines. We invite you to learn more about ISIS at **www.isis.washington.edu**.