The mission of the PennState Hershey Clinical Simulation Center is to improve patient outcomes by providing effective programs that promote and enhance clinical competence, teamwork skills, and interdisciplinary collaboration. To advance the field of healthcare simulation, the Center conducts innovative research in simulation theory, practice, and technology.
MESSAGE FROM SIM CENTER
LEADERSHIP

Elizabeth Sinz, M.D., Director
John H. Moyer M.B.A., Administrative Director

The Simulation Center’s 2010-11 Year in Review is our first. Now that we have been in the new facility for just over a year, we want to share some of what is new and exciting in simulation. This is a time of growth and innovation, common characteristics of the simulation community here at Penn State Hershey. We think you’ll agree that the scope of simulation activities this year illustrates an impressive level of new thinking about education.

Every department that utilized the old Sim Lab is expanding its use in our new facilities. For example, the medical school has moved all OSCE sessions to the Sim Center. The Pediatric Advanced Life Support course was relocated, as were many of the remaining AHA activities.

Departments that had not used the old Sim Lab are enjoying the new facility. For example, John Potochny, M.D., implemented the video display of microsurgery sessions for surgical sub-specialists who utilize microscopic techniques, and even provided a live feed from the microscope to a large classroom so learners could follow the procedure in real time; he also taught a multidisciplinary course on the management of plastic surgery patients.

Fort Indiantown Gap and the Sim Center are sharing equipment, facilities, technical expertise, and specialized teaching faculty. A mutually beneficial arrangement between the Sim Center and Emergency Medicine provides additional opportunities for all students thanks to a sharing agreement for the Lion Reach mobile classroom/simulator.

Two separate Sim Center grants focus on nontraditional students. One grant from the Agency for Healthcare Research and Quality focuses on developing a framework for assessing practicing physicians for their Maintenance of Certification requirements using simulation. A second grant will assess the utility of simulation to provide patients and their caregivers practice in managing PICC lines before they go home from the hospital.

You’ll read about a medical school organization whose mission is inter-professional cooperation, and how a First 4 Minutes exercise was used to demonstrate that objective to the medical and nursing students.

One of the strongest attributes of the Penn State Hershey Clinical Simulation Center is its multidisciplinary mission. As we move forward, we have the opportunity to learn from each other whether we are teaching, testing, or doing research on the cutting edge of patient safety. We hope that this report will inspire you to help create new opportunities for our students.
Simulation Center wins a Penn State Future Funds Grant

In January, Dr. Sinz was awarded a College of Medicine Future Funds Grant for the purchase of a pelvic exam simulator. This will help our medical students learn and practice pelvic exam skills.

Simulation Center Conducted Fall and Spring Instructor Courses (photo, below)

“Teaching with Simulation: An Instructor Course” is a comprehensive five-day course that teaches participants to recognize when to use simulation and to design and evaluate simulation sessions. Expert faculty, who are engaged in sim-based teaching and curriculum development, lead this intensive and interactive course. The next instructor course will be offered in May 2012.

For those with minimal experience in simulation, the Sim Center is developing a fall 2011 “Introduction to Simulation” course that will provide the basic start-up concepts, orientation, and a resource list for people who are interested in applying simulation to their own educational interests.

An advanced course in sim-based assessment will be offered in September 2011. Contact Sally Rudy at 717-531-5813 for information.

Institute of Healthcare Improvement Open School uses First 4 Minutes to Encourage Multi-Disciplinary Teamwork (photo, right)

Medical and nursing students have organized as an Institute of Healthcare Improvement (IHI) Open School chapter. They have worked with Public Health Policy graduate students at main campus to present annual seminars that foster interdisciplinary cooperation. A favorite seminar activity is the First 4 Minute challenge. The winner turns in the best resuscitation and teamwork performance.

“The students in the IHI Open School will be tomorrow’s leaders in improving patient safety through interdisciplinary teamwork and collaboration.”

—Greg Caputo, M.D., Chief Quality Officer
Partnership between the Sim Center and Fort Indiantown Gap

Through a reciprocal understanding, the Sim Center gained access to the Gap’s impressive inventory of simulation equipment and 30,000 sq. ft. of indoor/outdoor simulation training space. In return, the U.S. Army is given access to specialized faculty and experienced technical support. This year Emergency Medicine Drs. Kevin King, Lawrence Kass, and Scott Goldstein staged a realistic mass casualty and disaster scenario at the Gap for Emergency Medicine residents. It featured triage, stabilization, treatment, and evacuation. A highlight was massive bleeding from traumatic amputation. Robert Shotto, manager of operations for the Simulation Center, provided a weekend of on-site training at the Gap, instructing the 28th Division on the use and maintenance of high-fidelity mannequins.

“Without this reciprocal cooperation we simply could not offer our residents effective training for mass disasters. The Simulation Center’s agreement with Fort Indiantown Gap is a true win-win.” —Dr. Kass

In May, Craig Himmelwright, director of Service Operations for Draeger Medical, Inc. presented the Simulation Center with a donated anesthesia machine. This top-of-the-line unit is the same as used in most United States hospitals. (photo, below)

“This gift is essential for training our residents on the same machines that they will use in practice.” —Dr. Berend Mets, chair, Department of Anesthesiology
Recognition

American College of Surgeons Accreditation

The Simulation Center was re-accredited by the American College of Surgeons (ACS). Through accreditation, the College recognizes centers that have achieved the highest quality clinical leadership, surgical curriculum, and program administration. Penn State Hershey received its first ACS accreditation in 2007.

American Society of Anesthesiologists

The Sim Center is also one of only twenty-five simulation programs endorsed by the American Society of Anesthesiologists (ASA) and among just seven institutions approved by both the ASA and ACS.

“Achieving accreditation from these important organizations demonstrates our leadership position in education and our role in training clinical providers to deliver high quality, safe care for our patients,” —Dr. Sinz
**Research**

**Bosseau Murray, M.D, Anesthesiology**, and **John Moyer** collaborated with **Piezo Resonance Innovations, Inc.** (PRI) on their successful National Institute for Health (NIH)-funded grant. PRI developed the technology for enabling an epidural needle to rapidly vibrate, increasing its ability to penetrate resistant objects. This technology will improve epidural insertion through calcified tissues in elderly patients, improving patient safety.

**Dr. Murray** is developing an epidural simulator featuring an innovative haptic interface. *(photo, right)*

**Dr. Sinz** and the Simulation Center are participating in a multi-university research grant from the Agency for Healthcare Research and Quality entitled “Creating Simulation-Based Performance Assessment Tools for Practicing Physicians.” The Sim Center will work with ten other leading simulation centers to create a methodology for the assessment of board-certified anesthesiologists and to create a template for recertification. While the research is initially focused on anesthesiology, it is hoped that what is learned about assessments will be applicable to other specialties.

The Simulation Center conducted a study “During Chest Compressions, Does Gender, Weight, and Height Differences Have an Impact on the Effectiveness of CPR?” Data was generated by 150 fourth-year medical students during their Communication and Leadership Island course. Each student performed CPR, and their technique was assessed and later correlated to the participant’s height and weight. The results indicated that providers who positioned themselves directly over the patient obtained the best results, regardless of their physical characteristics.

The Simulation Center is creating innovative patient education through a grant from the **Franklin H. and Ruth L. Wells Foundation.** Through the program, soon-to-be-discharged patients and their families are provided hands-on simulator practice with PICC lines and other devices that patients need to operate at home.
Community Outreach

The Simulation Center Hosts the Rotary Group Study Exchange (GSE) Program. (photo, below)

Local Rotary clubs around the world swap study groups for up to six weeks in the host country. This year young professionals from Malaysia and Singapore toured the Simulation Center, the Hershey Chocolate Factory, The Hershey Story, and the Milton Hershey School.

The Simulation Center Hosts the World Affairs Council’s Global Health Series

The Simulation Center joined with the Penn State College of Medicine Global Health Center and the World Affairs Council of Harrisburg to host the council’s summer health seminar entitled “High Tech Health.” Matthew Moyer, M.D., gastroenterology, gave a presentation on surgery that accesses the body through natural orifices, eliminating infection and scars. Dr. Sinz provided an overview of health care simulation, and a tour of the Sim Center.

Spartan Academic Medical Experience (photo, above)

Each year the Simulation Center hosts the Spartan Academic Medical Experience (SAME), a Milton Hershey School program to give gifted students a five-
week, in-depth experience in various areas of academic medicine. This year seven students were mentored by the Sim Center staff over a two-week period.

“The Simulation Center is always one of the most popular segments of the students’ experience. It's high-tech, yet the theory of simulation learning is intuitive, so the students grasp what is going on from the first day.” — John Moyer

Derry Township Middle School Students Learn Physics in the Simulation Center (photo, below)

Derry Township Middle School students visit the Simulation Center as part of an intuitive introduction to physics. Dr. Sinz demonstrated physics of the cardiovascular system, including concepts of fluid, volume, and viscosity. This intuitive approach to physics is strategically provided before the students begin learning physics at school. It introduces real world applications of physics, particularly in health care.

An Outstanding Middletown High School student was mentored in the Simulation Center as part of the SEPA CREST Program.

The Collaborative Research Experiences for Students and Teachers program (CREST) encourages area youth to choose science as a career choice. CREST is funded by a $1.3 million Science Education Partnership Award (SEPA) grant from the National Institutes of Health.
Staff Outreach

Dr. Elizabeth Sinz is founder and past president of the Society of Simulation in Healthcare (SSIH) and remains active in the society. This year she was SSIH committee chair for certification, chair of the Beverley Anderson Scholarship Fund (to assist in bringing people to the meeting who may not be able to pay on their own), and provided reviews of research abstracts for the society. At the society’s annual meeting, Dr. Sinz was honored by receiving a Presidential Citation for her ongoing work.

Dr. Murray co-chaired a section of the Research Summit Meeting “The Path to Better Simulation Systems: Integration of Systems Design,” at the International Meeting on Simulation in Healthcare (IMSH). Also at IMSH he was a panel member for the workshop “Looking Ahead to 2021, Aligning the Long-term Views of Health Care Stakeholders.”

Dr. Potochny, and Mitchell Flurry, M.D., plastic surgery resident, presented a poster at IMSH that described their successful seminar on “Managing the Microsurgery Patient.”

Dr. Sinz, Sally Rudy M.S.N., R.N., and John Moyer presented a poster at IMSH that described the First 4 Minute program and its role as last year’s organizational goal.

Robert Shotto is on the newly formed Simulation Administration and Management Committee of the American College of Surgeons. He is helping to define how the College can be a resource to Simulation Centers that it accredits. He is also a simulation consultant to the American College of Chest Physicians, advising the College on its expanding agenda in simulation.

Mary Santos, M.D., director, surgical simulation, is involved with the Association for Surgical Education on issues related to the assessment and evaluation of learners, instructors, and curriculum. She is also a member of the Education Committee of the American Pediatric Surgery Association.

John Moyer is the Large Center Administration representative to the SSIH Committee on Technology and Standards. He is working to develop a library of reference documents as a resource to simulation center directors and administrators.
DR. POTOCHNY’S MICROSURGERY COURSE
MEDICAL EDUCATION

In April, Paul Haidet, M.D., medical education, and Martha Levine, M.D., pediatrics, pioneered a new use of standardized patients in a Department of Humanities Medical School course for medical students. During this course, ten fourth-year medical students had the opportunity to conduct a medical history with a standardized patient who was trained to portray clues that provided important narrative context around their illness. Such narrative context is often not explored by physicians and has been found to be an important source of medical errors in diagnosis and treatment. The Penn State experience was designed to portray some of the common emotional clues that patients present with and give the students communication experience in dealing with such clues. As part of the simulation, students used a new technology, called “stimulated recall” to deepen their skills and improve medical communication.

MICROSURGERY

Dr. Potochny established a micro-surgery training room in an OR suite shared with Comparative Medicine. The Sim Center outfitted the room with video conferencing, video feed directly from the microscope to a local wide-screen, and to the Sim Center’s audio-visual system.

Last summer Potochny organized a Saturday course on “Managing the Microsurgery Patient.” The course was held in the Sim Center, and included nurses from our ED, PACU, OR, SICU, and PICU. After discussing the general management of microsurgery patients, including pharmacology and flap monitoring, they participated in simulated microsurgery examples gathered from around the hospital.

Dr. Potochny conducted a survey before the course, and another immediately afterwards. The results showed that in six months the participants demonstrated they were able to retain this information.

ANESTHESIA

Maintenance of Certification for Anesthesia (MOCA): The MOCA course is accredited by the American Society of Anesthesiologists (ASA) and allows practicing anesthesiologists to meet the Society’s requirements for maintenance of competency. It is designed to refresh procedural and teamwork skills and management of important crisis events in anesthesia. The ASA is the only specialty group currently requiring practicing physicians to maintain their certification by engaging in a simulation-based course.

The Sim Center is among only a few dozen centers nationally that has been certified by the ASA to offer MOCA and is recognized as one of the more rigorous and demanding.

“The Simulation-based education component of the ABAs Maintenance of Certification in Anesthesia (MOCA) can be regarded as a cutting-edge use of the best educational approaches currently available to improve the performance of practicing anesthesiologists. I believe strongly in the value of such courses in improving medical practice and patient care.

In the future we are planning that all faculty in the Department of Anesthesiology at the PennState Hershey Medical Center will use the MOCA courses to help assure that each performs at the very highest possible level as part of the Department re-credentialing requirement.”

—Berend Mets M.B.,Ch.B., chair, Department of Anesthesiology

Scheduled Dates for the MOCA in 2011-12:
September 17, 2011; Nov 3, 2011; and March 10, 2012

To register, call Kathleen Gingrich, 717-531-4626.
PEDIATRICS

A pediatric group called the Advanced Pediatric Education Complex (APECx) is developing a robust training environment for pediatric skills. APECx is lead by Drs. Tim Palmer and Mary Santos and includes individuals with expertise and interest in preparing our students, trainees, and staff to expertly care for pediatric patients using simulation based methods. APECx has contributed to a wider appreciation for pediatric simulation and has been awarded Children’s Miracle Network funding of more than $60,000 for high fidelity mannequins.

Jen Phoenix, R.N., developed an innovative nurse competencies course, “Airway Management,” that includes a traditional competency evaluation integrated into a simulation session on managing an emergency.

Phoenix uses the Cerner Trainer Electronic Medical Record, loading mock patient scenarios which are accessed on the computers outside the patient room, prior to the session. After the emergency is contained and treatment is given, notes are placed into the EMR. Learners’ patient charts are then audited as part of the training. Phoenix finds that using an EMR makes her simulation training more realistic, and, as she says, “helps connect the correct brain pathways so the right sequences happen on the floors.”

Beyond airway management, Phoenix has designed the Room of Horrors (photo, below). She used the MIDAS database to find the most common pediatric errors and included them in the course of several sessions.
Recognizing the shared patient safety mission of the hospital and of the Simulation Center, Penn State Hershey is committed to integrating simulation into most departmental curriculum. The above graph demonstrates the successes with which we are achieving this objective.

Achieving Objectives

Total Center Hours (including setup)