Interprofessional Immersive Simulation Center

The Interprofessional Immersive Simulation Center — UT IISC™ — located on Health Science Campus, is a highly sophisticated simulation center that provides education of health-care professionals in the areas of skill development (including professionalism and communication skills), interprofessional team training; electronic learning; and competency assessment.

The UT colleges of Medicine and Life Sciences, of Nursing, and of Pharmacy and Pharmaceutical Sciences have worked collaboratively with other health and non-health related disciplines at the University to develop the center that promises to revolutionize some aspects of the way health-professions students at UT learn about the human body and taking care of patients.

The use of simulation in health education is growing as increasing numbers of studies demonstrate the effectiveness of simulation training in improving safety outcomes and learner confidence. Requirements to include simulation at all levels of education are now becoming a standard in some health-professional accreditation standards, and irrefutable evidence now supports the hypothesis that training with simulated models and patients leads to improvement in clinical skills as compared to learning in the traditional classroom setting.

The new approach will result in graduates who are best prepared for delivering safe, high-quality health services and for enhancing the health of northwest Ohioans.

Many simulation centers use high fidelity adult human simulators, but UT has simulators that reflect ages and ranges of neonates, young children, pregnancy and birthing as well adult patients.

Medical students use the simulation center routinely and nursing students, for example, now complete two simulations in each semester of their programs of study. Future plans call to increase the number of interdisciplinary experiences once renovation of the center and installation of new equipment is complete. In addition to formal skills development sessions, there is an interprofessional “open lab” that students use to practice their skills in their free time.

In operation since July 2010, the center provides training for more approximately 1,000 students and resident physicians a month, a number that will grow substantially in future years. The center is also used by area health-care institutions and students from other schools.

The simulation center features a three-dimensional, ceiling-to-floor computer-design wall. Students and faculty members wear sophisticated 3-D glasses that allow the 3-D graphics generated on a three-dimension screen to be seen.

The technology allows students to gain better understanding of how certain anatomical structures interact and disease processes develop. For example, a project completed by an interprofessional group of students, led by a master’s student, allows students to “fly” from the oral cavity of a patient suffering from chronic obstructive pulmonary disease down through the lungs to a point where gases are exchanged in alveoli. The experience links the physiologic changes of a healthy to a diseased lung and the disease’s impact on a person’s daily activities.
The simulation center also features new immersive technology called an i-Space TM, a three-dimensional virtual reality environment.

The i-Space TM is basically a small theater in a larger room. Using mathematical formulas, the i-Space TM creates a three-dimensional objects from two-dimensional MRI data. Three-dimensional images are projected onto three walls and the floor to create images of the anatomical and physiological structures being studied. Inside this virtual immersive environment, faculty members and students, wearing wear sophisticated 3-D glasses, see and walk around medical images that are “floating in the air” and magnify, manipulate and rotate them to get different three-dimensional views of the organ or pathology.

Sensors tracks the movements of people in the i-Space TM, and computers make necessary video and audio adjustments, helping to create the best virtual environment in which to learn, to explore and research health and non-health phenomena, and to create innovation that have real-world applications.

The center’s goals are to:

- Advance clinical skills education and competency assessment;
- Provide national and global leadership in improving patient safety and clinical quality;
- Transform the learning environment for health professionals;
- Advance interdisciplinary education and team training;
- Promote interdisciplinary collaboration in behavioral and human factors research;
- Develop reliable and valid educational and clinical competency assessments and outcome measures;
- Create industry partnerships to develop and test new processes, products and devices and advanced simulation;
- Exceed accreditation requirements; and.
- Conduct human factors research and enhance human performance.

As it looks to the future, center will work to break down the traditional educational silos between medicine, nursing, pharmacy, allied health and public health as UT’s four colleges with health education programs develop curricula and educational modules that ensure students learn together as a team.

The center also will work to position itself as a community and regional asset, providing unique educational and research opportunities that attract talented students, faculty members, scientists, emergency first-responders, and health-care professionals from other hospitals in the region.

Potential research opportunities range from the study of the best methods for development of clinical skills to the impact of simulation training on clinical outcomes. A major research goal is to enhance human performance resulting in increased efficiencies, safer and more cost-effective health care. New medical and surgical products, including communication technology, could be tested using University and community health professionals.

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Criterion Three, core component 3c
Student Learning and Effective Teaching
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The University is currently having discussions with Department of Defense to conduct research at the facility. Two projects have been approved, but await funding. Discussions are under way with the Human Effectiveness Directorate at Wright Patterson Air Force Base in Dayton, Ohio, involving joint studies into human effectiveness.

Fund-raising plans are under way to develop addition capacity for the center, including establishment of a space that will be called the Progressive Anatomy & Surgical Skills Center that will provide a state-of-the-art surgical training center for students, resident physicians, surgeons and health-care practitioners at UT and at hospitals throughout the region. The proposed center calls for establishment of surgical simulation training suites, fresh tissue labs, virtual operating suites and a museum for plastinated tissue models.

Future plans also call for space for the Advanced Clinical Simulation Center and the Virtual Immersive Reality Center.

The close proximity of the facility to several other significant University physical resources — the Ruth Hildebrand Clinical Skills Center, the Center for Creative Instruction, the Department of Neuroscience, and the UT Medical Center creates a dynamic, innovative and productive area that will foster creativity and innovation.