Future surgeons practice techniques with new simulation teaching tool

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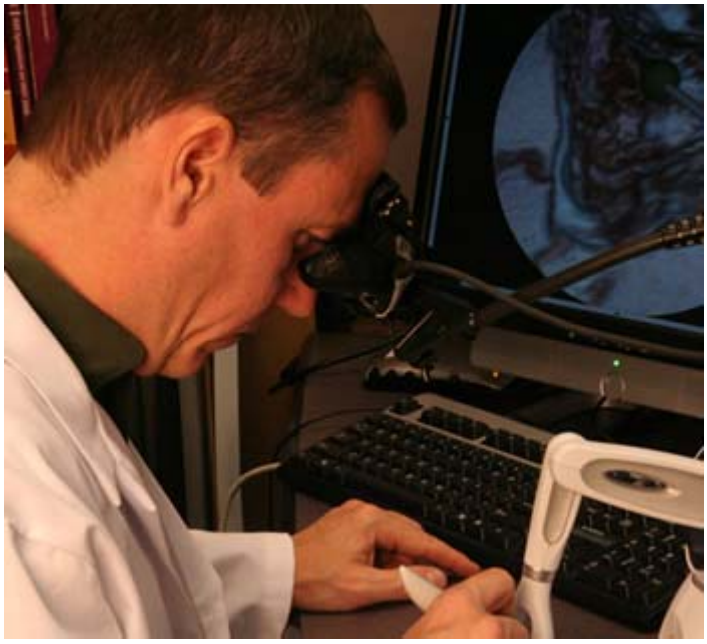
National award for special contributions to medical education recognizes Ohio Supercomputer Center, Nationwide Children's, Ohio State innovation: The next generation of surgeons – many who grew up playing video games – are using real-time, interactive computer simulations to learn the difficult and delicate surgical techniques associated with the temporal bone in the human skull.



The system, called the Virtual Temporal Bone Project, received the prestigious 'Dr. Frank H. Netter Award for Special Contributions to Medical Education' from the Vesalius Trust for Visual Communication in Health Sciences during the annual meeting of the Association of Medical Illustrators, July 16-20, in Indianapolis.

Developed as a collaborative project between physicians and researchers at Nationwide Children's Hospital, The Ohio State University Department of Otolaryngology and the Ohio Supercomputer Center, the Virtual Temporal Bone simulator creates a true-to-life experience encountered in ear surgery. The temporal bone contains the structures for hearing and balance.

For example, a binocular viewer replicates the view that a surgeon would see

through a microscope during surgery, and a force-feedback device creates the pressure and resistance experienced during surgery. Drilling sounds are modulated based upon the pressures and area of bone being removed. As an educational tool, the system can provide an open-ended dissection of the virtual temporal bone, assist with identifying critical structures through an intelligent tutor, and capture the resident's performance.

"The high production values, the incorporation of multiple sensory modalities - sight, sound and touch- and the ease of distribution make the Virtual Temporal Bone a unique learning object with tremendous potential impact in the field of medical education," said Bill Andrews, associate professor and education program coordinator of the medical illustration graduate program, Medical College of Georgia, and a member of this year's award selection committee.

The project's lead investigators, Don Stredney, director of the Interface Lab and a research scientist in biomedical applications at the Ohio Supercomputer Center, and Gregory Wiet, MD, a pediatric otolaryngologist, head and neck surgeon with Nationwide Children's, have begun a multi-institutional validation study involving multiple national otolaryngology training programs. The goal of the study is to determine if students who are taught this kind of surgery, using the simulator, achieve better surgical results compared to traditional methods.

"Being selected as a recipient of the Netter Award showcases the impact virtual simulations can have on training our future medical professionals," said Stredney, who also serves as an adjunct instructor in biomedical informatics and otolaryngology at The Ohio State University. "Without a virtual simulation environment, medical residents would learn this surgery by working on cadaveric specimens and apprenticeships in an operating room. We've created a safe, cost-effective way to learn fundamental techniques that could not only obviate the initial need for physical bone, but present a greater diversity of bone specimens to enhance training."

"With this type of training, surgeons are not only learning with their eyes, but also with their sense of touch," added Dr. Wiet, who also serves as associate professor of otolaryngology and as adjunct faculty in biomedical informatics at The Ohio State University College of Medicine. "This could be an important tool in the learning process for surgeons to develop all their senses in order to guide their surgery."

The Virtual Temporal Bone Project is funded by the National Institute on Deafness and Other Communication Disorders, The National Institutes of Health.