3D Mixed Simulator Helps Improve Catheter Placement Training for Medical Students, Clinicians

Simulator Uses Ascension Sensors to Track Needle Placement

Burlington, VT (October 3, 2012) – A 3D mixed simulator developed by researchers at the University of Florida is helping medical students, residents, faculty and staff gain valuable experience in placing a central venous catheter without risk to patients. The simulator, which combines physical and virtual elements, uses Ascension sensors to track and record needle placement, and can be viewed at: http://simulation.health.ufl.edu/research/cvl_intro.wmv.

Health care professionals typically insert a central venous catheter -- a long, thin tube also known as a central line -- into a major vein to gain access to the central circulation. It can be used to administer medicine, obtain blood samples or monitor central venous pressure.

The Institute for Healthcare Improvement, an independent not-for-profit that promotes best practices in medicine, recommends inserting these catheters in the vein beneath the clavicle, a technique known as subclavian central venous access, to lower the risk of infection. Training and supervision are needed to insert a needle safely and accurately with this approach.

The University of Florida (UF) in collaboration with Ascension Technology has developed a new simulator to teach placement of central venous catheter lines. With over 5 million central lines placed each year, finding a safe and effective training aid for this common procedure is of keen importance to the medical community. The UF simulator uses a 0.9 mm magnetic sensor in the tip of an introducer needle to track its path into the venous system and visually display deviations into nearby anatomy.
With the University of Florida’s 3D mixed simulator -- a model of a human torso, neck and head -- students and residents can practice placing a needle into either the subclavian vein or the internal jugular vein while avoiding the nearby arteries or lungs. A sensor in the needle tip detects arterial punctures and lung strikes, and also displays the distance by which artery and lung puncture was avoided, making it possible to use an automated scoring algorithm. The sensor allows recording and playback of the needle’s path.

“Based on previous experience with externally placed trackers, we needed a sensor that would allow us to track the tip of the needle internally,’ said Dr. Samsun Lampotang, Professor of Anesthesiology at the University of Florida and Director of the Center for Safety, Simulation & Advanced Learning Technologies. “The needles used for venous access are small. It was really helpful to find the Ascension sensors because they are tiny enough to fit inside the needles.”

Lampotang and his colleagues have completed a learning outcome study indicating that the simulator improves residents’ performance in subclavian central venous access. They have submitted the results for peer review and publication.

The simulator is currently being used to train clinicians at the University of Florida and has been used in vascular access workshops in the United States, the Netherlands and Germany. The University of Florida researchers are working to make it available commercially, and have applied a similar design to build mixed simulators that also use Ascension sensors for ventriculostomy, regional anesthesia, radiofrequency lesion and spinal instrument implantation.

For more information about the simulator, contact Dr. Samsun Lampotang at slampotang@anest.ufl.edu

###

**About Ascension**

Ascension Technology Corporation, an NDI company located in Milton, Vt., is a world leader in magnetic and optical tracking solutions for medical, biomedical and commercial applications. News about Ascension trackers in biomedical research is available at www.ascension-tech.com, or from Joanna Harrington at: 802-893-6657, ext. 44.