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Simulation in robotic surgery: The challenges and opportunities

Jeffrey Berkley

Mimic Technologies Inc., USA

According to the 2009 report by the Institute of Medicine titled “To Err is Human – To Delay is Deadly”, preventable medical errors in the United States have been increasing on the order of 1% each year to exceed 100,000 deaths per year. Simulation training has been identified as one means of reducing errors and the adoption of simulation has been especially rapid in the field of robotic surgery. However, there are plenty of challenges to integrate simulation into a hospital’s overall robotic training protocol. Demands on a surgeon’s time, efficient use of training content, and the institution’s willingness to enforce simulation testing are all important factors that affect the value that can be derived from simulation training. Berkley’s lecture will address many of the current limitations and opportunities presented through simulation with a review of the research and a preview of new simulation technologies that will soon be available.

Biography

Jeff Berkley is the founder of Mimic Technologies, which was the first company to establish the market for robotic surgery simulation. Since the beta release in January of 2007, Mimic’s da Vinci simulation has become the most rapidly adopted simulation platform with the largest installation base of any digital surgery simulator. He is well known as a leader in the fields of haptics, surgery simulation, and real-time finite element modeling. He has published and served as a reviewer for various journals such as IEEE Transactions on Visualization and Computer Modeling, Virtual Reality, and the Electronic Journal of Haptics Research and Medical Imaging. He brings over twenty years of experience in the mathematics, engineering and healthcare disciplines that utilize virtual reality applications. While obtaining his Masters of Science in Biomedical Engineering from Northwestern University, he also worked for MusculoGraphics, where he developed his first real-time finite element analysis models. He continued to advance his real-time algorithms while receiving his PhD in Mechanical Engineering from the University of Washington’s Human Interface Technology Laboratory. He founded Mimic Technologies upon graduation, where he then applied his knowledge of haptic feedback and continuum mechanic-based tissue modeling to surgery simulation. He also served in the Naval Reserves for eight years as a medical corpsman where he received experience in field medicine and nursing.

jeff@mimicsimulation.com

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