

ACS 2022 Surgeons and Engineers: A Dialogue on Surgical Simulation Meeting

Promoting Technology and Collaboration

Novel Laparoscopic Spatial Training System

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Background: Laparoscopic simulation is an essential part of the modern surgical curriculum because it provides opportunity to learn and practice various surgical skills and tasks before exposure to patients in the operating room, thereby lessening the risk of trainee errors. The two types of simulators in common use are the low-cost physical box trainers, and the much more expensive virtual reality simulators. The American College of Surgeons developed a program called the Fundamentals of Laparoscopic Simulation (FLS) Surgical Simulator Method which includes five basic tasks performed in a box trainer. The Novel Laparoscopic Spatial Training System more effectively targets the development of the FLS core skills of two-handed coordinated movement (development of non-dominant hand), tactile perception/ force sensitivity, and three-dimensional depth perception. It is user friendly and cost effective.

Technology Overview: The Novel Laparoscopic Spatial Training System will provide enhanced training outcomes compared to the FLS system. It will expose the trainee to all aspects of laparoscopic surgery beyond the current five basic tasks performed in the FLS box trainer. The system will incorporate graduated levels of difficulty to aid in trainee skill development for easily reconfigurable tasks. It will also measure speed and precision of movement. Electronic interactive devices in the laparoscopic box trainer can be connected to a personal computer to facilitate various learning activities. These tasks are automatically recorded and timed providing user feedback.

Potential Application in Surgical Simulation and Education:

- Improves training outcomes compared to the FLS system.
- Detailed design of the system components and models is considerable cheaper
- The design and implement several new models and tasks which more effectively target and develop the core skills of two-handed coordinated movement (development of non-dominant hand), tactile perception and force sensitivity, and three-dimensional depth perception.

Potential Opportunities to Collaborate: They're opportunities to collaborate with medical schools and training institutions. There is opportunities to improve and learn new techniques in surgery.