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ADVANCED SURGICAL TRAINING MODEL SET THROUGH ADJUSTMENT OF TARGET STABILITY
ID# 2024-071

HIGHLIGHTS

- The model is engineered to meet training objectives by facilitating variable tissue mobility.
- Incorporating advanced motion tracking for precise evaluation of tissue interaction and hand movements.
- Adjustable difficulty and support for diverse surgical tasks enhance adaptability across skill levels, promoting progressive learning.

OPPORTUNITY

The University of Alberta researchers have developed a simulation model designed to improve tissue mobility, realism in stretching, and a thorough assessment of tissue traction. This advancement utilizes synthetic tissues connected to various modifiable bases such as wood (stationary), rubber (mobile), and steel springs (vibrating) to replicate a wide range of tissue behaviors encountered during surgery, creating varying difficulty levels that can be adapted to the trainee's skill level.

Motion sensors are strategically positioned on the synthetic tissues, instrument handles, and tips of laparoscopic instruments. This setup ensures precise capture of tissue traction and hand movements, enabling quantitative evaluation. The model also supports loading different surgical tasks—such as dissection or cutting—on its dynamic base. This flexibility allows for adjusting task demands without significantly changing the procedures or tasks themselves, promoting progressive learning and skill refinement across various surgical training scenarios.

Lab scale testing of the simulation model was conducted at the Surgical Simulation Research lab in the Department of Surgery at the University of Alberta. Participants practiced suturing on a laparoscopic simulation station and were divided into experimental and control groups. Using our model, we created workload-adapted training by adjusting tissue size and stability parameters. The results showed a significant advantage in skill transfer when implementing a workload-adapted training protocol based on our model, significantly improving suturing time and total number of sutures per session.

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COMPETITIVE ADVANTAGE

- Cutting-edge design combined with practical utility
- Enhanced effectiveness for MIS training
- Seamless integration with current simulation platforms to deliver comprehensive metrics on tissue traction and manipulation.
- Supports various surgical tasks with adjustable demands

IP STATUS

- Patent pending

INVENTOR

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MORE INFORMATION

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