OPPORTUNITY FOR NEW TRAINING DEVICE

Surgeons use extra-corporeal membrane oxygenation (ECMO) to provide artificial oxygenation to blood cells. This practice helps save failing hearts and lungs during a surgery and the skill is difficult to perfect without practicing on real patients. The goal is to create a trainer that helps surgeons perfect a difficult skill without practicing on real patients. Honing these skills will lead to better outcomes.

PRINCIPAL INVESTIGATORS

Pramod Chembrammel, PhD, a research scientist from Health Care Engineering Systems Center at University of Illinois Urbana-Champaign; Dr. Matthew Bramlet, Director of the Advanced Imaging and Modeling Program at Jump Simulation and Assistant Professor of Clinical Pediatrics at University of Illinois College of Medicine at Peoria; and Dr. Jai Raman, Professor of Cardiothoracic Surgery at Rush University Medical Center.

OUTCOME

Extra-Corporeal Membrane Oxygenation (ECMO) is a technique that provides mechanical support to a failing heart and/or lungs using a pump to circulate blood through an artificial lung back into the bloodstream of a patient. Improvements to the heart-lung bypass support have resulted in growing use of the technique. However, many health care teams are unfamiliar with the utilization of this treatment and there are no simulation platforms to help train physicians on the fundamental steps of access, cannulation, and connection to ECMO. With the help of a grant from Jump ARCHES, an OSF Innovation program, we have developed the ECMO Training Simulator to aid in the quick deployment of this procedure for failing heart/lungs.

- The simulator includes a customized mannequin with underlying tissue-like vasculature that can be used to practice cannulation (monitor flashback of blood), stent replacement and other endovascular procedures such as angiogram/angioplasty.
- It can be scanned using ultrasound or X-ray, permitting trainees to acquire or improve the skills required to perform ECMO.
- The task trainer is controlled by a software model of human physiology which can simulate various conditions during a surgery and ECMO.
- The device will soon include a life-like blood simulant that is circulated through the vasculature by means of a pumping system. The substance contains pigments that changes color from deep red, simulating impure blood to lighter red which simulates oxygenated blood.
ADVANCING SIMULATION

OSF Innovation has the power to dramatically change the health care industry by leading the development and use of simulation technology and services in health care. We rely heavily on simulation to train and develop our clinicians, cut health care costs and ultimately transform how we deliver care.

OSF Innovation, through Jump Simulation and the University of Illinois, is expanding the use of simulation to observe, rethink, retool, redefine and test solutions to ensure better care for all. Our access to subject matter experts in engineering, research, data collection and analytics, design and investments is a unique offering in the health care simulation space and allows us to quickly bring new ideas from concept to reality.

ABOUT JUMP ARCHES

Jump ARCHES (Applied Research for Community Health through Engineering and Simulation), a collaborative effort between the University of Illinois College of Engineering and University of Illinois College of Medicine at Peoria focuses on providing solutions to the biggest problems in health care. Jump ARCHES supports select teams of clinicians and engineers working together to develop new tools that enhance clinical outcomes at OSF and medical education at facilities like Jump.

Requests for Proposals for Jump ARCHES grant funding are open to OSF HealthCare clinicians and faculty members at the University of Illinois College of Engineering at Urbana-Champaign and College of Medicine at Peoria.

For more information on this program and other Jump ARCHES projects, visit www.jumpsimulation.org or contact:

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