

Endovascular Simulator for Research, Development, Training and Treatment Planning

Vascular disease ultimately affects every organ in the human body. The treatment of vascular disease whether it involves the heart, brain, periphery and every other organ in the body has been steadily evolving from traditional surgery to more minimally invasive endovascular techniques. The advances in endovascular technology has already fundamentally altered the way we treat coronary artery disease, cerebral aneurysms, carotid stenosis, abdominal aortic aneurysms among numerous other disease processes.

Simultaneously, medical training of students, residents, fellows and physicians has been undergoing a transformation as the "see one, do one, teach one" model has become obsolete. The acquisition of good clinical judgment is derived from experience with difficult scenarios frequently resulting from complications during procedures and this experience is often preceded by poor clinical judgment. For surgeons, interventionists or any proceduralist there is a cost to acquiring a level of expertise that is considered mastery. This cost is the collateral damage in human quality of life.

We strive to reduce this collateral damage by replicating the vascular system from the heart to the aorta, cerebrovasculature and the peripheral vasculature. This replicator allows for the performance of endovascular procedures under real life fluoroscopic conditions with the actual access devices and implants that are utilized in clinical settings. It is fundamentally different than the current generation of endovascular simulators that model the performance and behavior of wires and catheters with computer software in a user interface that has no relevance to clinical procedures. These simulators are essentially glorified video games.

B. Barry Lieber,
Professor, Department of Neurological Surgery
Stony Brook University Medical Center