Mixed Reality REBOA Simulator Fact Sheet
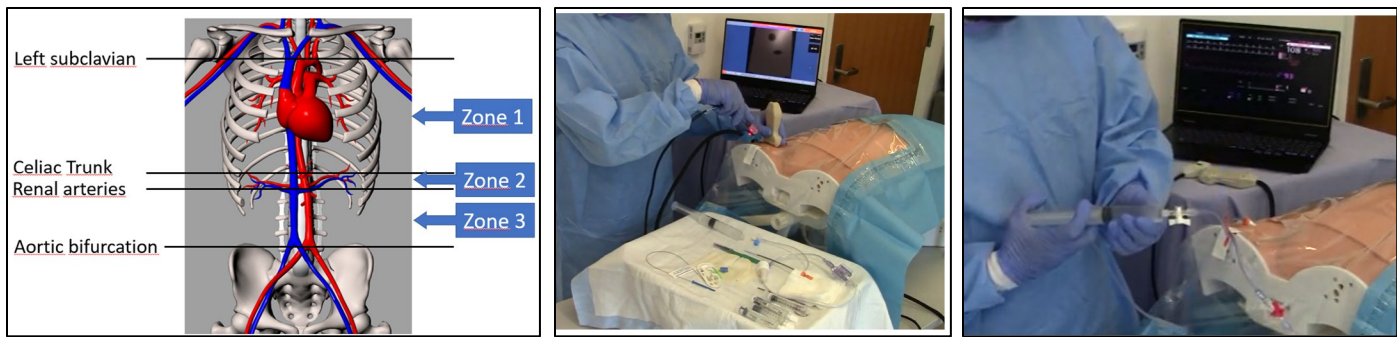University of Florida Center for Safety, Simulation & Advanced Learning Technologies

This turnkey, mixed reality simulator is for practicing, learning, teaching and debriefing resuscitative endovascular balloon occlusion of the aorta (REBOA) by the femoral artery approach with ultrasound guidance. Designed for austere environments, it does not require wireless or internet access; accepts 110/220V, 50—60Hz. It can be unpacked and set up by a person unfamiliar with it and be operational in 5-7 minutes. The portable simulator fits inside military-spec padded cases with inbuilt wheels and telescoping pull-handle that meets airline checked luggage size limits (L+W+H=60") and weighs less than 50 lbs.

https://simulation.health.ufl.edu/technology-development/augmented-reality-mixed-simulation/reboa-simulator/

Procedures:

REBOA via Right / Left Femoral Artery Access	Out-of-Plane/In-Plane/Oblique US-Guided
Right / Left Femoral Vein Access	Out-of-Plane/In-Plane/Oblique US-Guided

Components:
- Virtual coach for instructor-less self-study and mastery training
- 3D-printed bony structure physical mannequin
- Virtual model of the anatomy of the pelvis, thoracic cage, and aorta
- Tracked interoperable instruments: needle, ultrasound probe, virtual camera
- Measurement of the insertion depth and balloon inflation volume of the REBOA catheter, and detection of the Zone where the balloon is inflated
- Common SMMARTS modular stand for use with other modular anatomies
- Automated scoring and replay system

Technology:
- Adheres to SMMARTS (System of Modular Mixed and Augmented Reality Tracking Simulators) rapid simulator development platform specifications
- Quick-release placement and indexing of SMMARTS-compliant anatomies to SMMARTS platform
- Anatomic and physiologic parameters based on data from current literature
- Precise (0.2 millimeter) tracking of all tracked tools in six degrees of freedom

Features:
- Virtual coach for self-study and self-debriefing
- Adjustable view modes for realism and AARs
- Ultrasound probe with depth markers
- Anisotropy simulation for both needle and vessels
- Log-in feature with a specific ID for each trainee
- Validated by a learning outcome study
- Arterial pulsation and vein compression
- Cognitive aids for probe and needle orientation
- Simulated patient monitor
- Debriefing with instant records of the procedure
- Compatible with all Seldinger technique steps