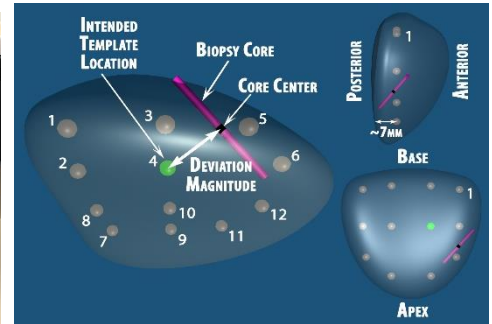
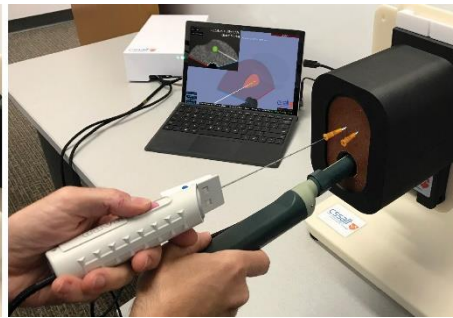
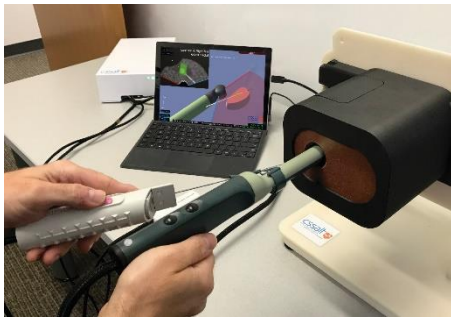


Mixed Simulator of TransRectal and TransPerineal UltraSound Guided Prostate Biopsy Fact Sheet

University of Florida Center for Safety, Simulation & Advanced Learning Technologies



This robust, turnkey mixed reality simulator simulates part of an anatomically correct rectum, prostate and perineum for practicing, learning, teaching and debriefing transrectal ultrasound guided (TRUS) and transperineal (TP) prostate biopsy (PBx). Designed for austere environments, it does not require wireless or internet access or wet fluids; 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 a military-spec padded case 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/mixed-simulator-of-transrectal-transperineal-ultrasound-guided-prostate-biopsy/>

Procedures:

- TRUS side-fire (decubitus, supine, etc.): *Templated, targeted, saturation, cognitive fusion with sagittal and optional transverse insonation planes*
- TRUS end-fire (decubitus, supine, etc.): *Templated, targeted, saturation, cognitive fusion with sagittal insonation plane*
- Transperineal prostate biopsy (supine): *Templated, targeted, saturation, cognitive fusion with sagittal and transverse insonation planes*

Components:

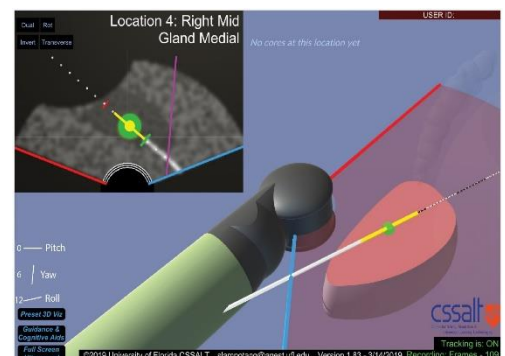
- Virtual model of the anatomy of the prostate, urethra, bladder, seminal vesicles
- Tracked interoperable instruments: TRUS probe, needle, virtual camera
- Common SMMARTS modular stand for use with other modular anatomies
- Automated scoring and replay system
- Cognitive aids, 3D visualization and instructional materials such as online videos

Technology:

- Adheres to SMMARTS (System of Modular Mixed and Augmented Reality Tracking Simulators) rapid simulator development platform specs
- Quick-release placement and indexing of SMMARTS-compliant anatomies to SMMARTS platform
- Anatomically correct virtual and physical models in the prostate library, based on medical imaging scans of real humans
- Precise sub-millimeter tracking of all tracked tools
- High-durability simulated tissue can be rejuvenated in-situ for indefinite re-use
- Three insonation planes are simulated in the BK 8818 TRUS probe: sagittal side-fire, transverse side-fire, sagittal end-fire

Features:

- Toggle visibility of anatomical structures
- 3D visualization of prostate and template locations
- Ultrasound probe with 6DOF
- Tactile feedback of perforating prostate
- Virtual lesion placement



- Cognitive aids for locations of colored dots in template
- Cognitive aids for probe and needle orientation
- Debriefing with instant replay of past procedure
- Needle stop line coaches insertion of biopsy needle
- Patient groans in pain if TRUS moved with needle in