TITLE: Modular Central Venous Access (CVA) Simulator: Patient Outcomes and Return on Investment Following Mandatory Training

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FACULTY MENTOR DEPARTMENT

Anesthesiology

RESEARCH PROJECT DESCRIPTION

This is an observational educational cohort study conducted to determine if mandatory central venous access (CVA) training (conducted May through July, 2018) using a simulator equipped with augmented reality (AR) visualization, an integrated tutor for self-study, and self-debriefing reduces the complication rates (e.g., iatrogenic pneumothorax; arterial puncture) during central venous access for anesthesia, emergency medicine, surgery, and internal medicine residents, faculty, and mid-level providers at UF Health Gainesville. We will conduct a retrospective chart review of central venous access procedures for the 18 month period prior to initiating training and will collect prospective data in the months following training for review at 6 months, 1 year, and 18 months. Our comparison site is UF Health Jacksonville where we will review aggregate complication rates for CVA during the same time periods. Since major complications are relatively rare compared to the overall number of procedures performed, we will also calculate healthcare costs associated with procedural complications pre-intervention and post-intervention to compare with the costs associated with mandatory simulator training in order to examine return on investment (ROI).

Our research hypotheses are:

- There will be a decreased incidence of CVA-related complications following the mandatory training in the UF Health Gainesville group.
- The rate of CVA-related pneumothorax and arterial punctures in the UF Health Gainesville group, who trained to competency with the augmented reality CVA simulator, will be lower than in the control group from UF Health Jacksonville whose procedural training does not include the AR CVA simulator.

Role of the medical student:

- Assist the Research Coordinator with recruitment/scheduling of participants for the mandatory mass intervention training,
- Proctor the simulator training sessions;
- Maintain project database;
- Assist with data analysis and manuscript preparation.

Relevant literature:
Sappenfield JW, Smith WB, Cooper LA, Lizdas D, Gonsalves DB, Gravenstein N, Lampotang S, Robinson AR 3rd. Visualization improves supraclavicular access to the subclavian vein in a mixed reality simulator. Anesth Analg. 2017 Nov 30. doi: 10.1213/ANE.0000000000002572. [Epub ahead of print] PMID: 29200069

Robinson AR 3rd, Gravenstein N, Cooper LA, Lizdas D, Luria I, Lampotang S. A mixed reality part-task trainer for subclavian access Simul Healthc. 2014;9(1):56-64.