Ultrasound Simulation for Regional Anesthesia

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Regional anesthesia is an essential skill in the practice of Nurse Anesthesia, and future employment demands expertise. Literature supports the addition of simulation training to existing didactic and apprenticeship education to improve clinical expertise.

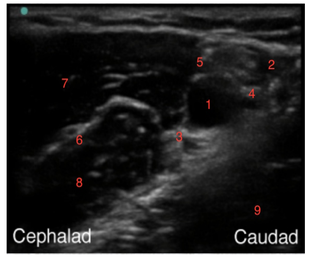
The purpose of this project was to trial simulation training, focused on anatomical visualization with ultrasound for regional anesthesia, as a means to improve student performance and confidence.

- Facility project approval and exemption determination by IRB.
- Hands-On Test: Ultrasound to obtain visualization for axillary (cohort 1), interscalene (cohort 2) block on live-model. Expert CRNA observed performance to determine if image was clinically acceptable. Yes/No result, and time necessary for visualization recorded.
- Written Test: Anatomical structures to be named, (fig. 1).
- Expert led practice with visualization for interscalene, supraclavicular, axillary, TAP, adductor canal, popliteal and IPACK blocks.
- Testing repeated after completion of training.

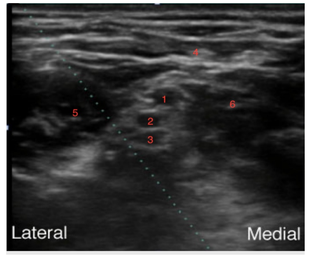
Table 1. Project Participants

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS		Cohort 1 (N=9)		Cohort 2 (N=12)	
GENDER					
	Female	5	55%	8	67%
	Male	4	45%	4	33%
TYPE OF ICU					
	CVICU	2	22%	5	42%
	MICU/SICU	2	22%	2	17%
	Neuro/Trauma	4	45%	1	8%
	Mixed/Other	1	11%	4	33%
AGE					
	<30	4	45%	5	42%
	30+	5	55%	7	58%
YEARS IN ICU					
	<4	4	45%	5	42%
	4+	5	55%	7	58%

Figure 1. Ultrasound Image(s) for Ax & IS Block



1) Axillary A. 2) Axillary V. 3) Radial N. 4) Ulnar N. 5) Median N. 6) Musculocutaneous N. 7) Biceps 8) Coracobrachialis 9) Triceps



1) C5 Nerve Root 2) C6 Nerve Root 3) C7 Nerve Root 4) SCM 5) Middle Scalene M. 6) Anterior Scalene M.

- Cohort 1: Mean Pre Score: 33%, Mean Post Score: 90%, P<0.05
- Cohort 2: Mean Pre Score: 50%, Mean Post Score: 100%, P<0.05

Figure 2. Ability to Produce Clinically Acceptable Image

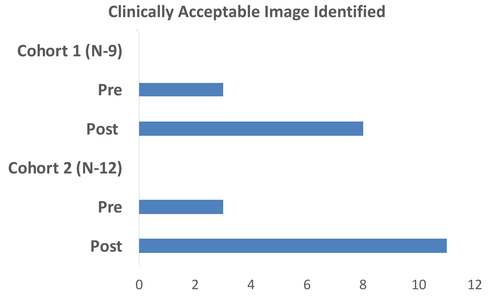
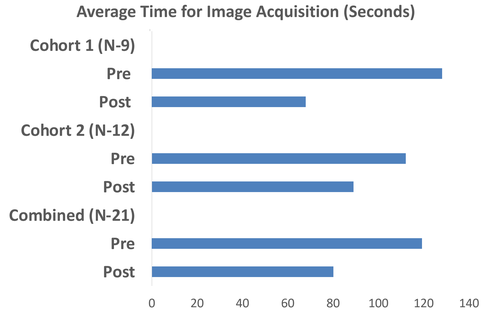


Figure 3. Time Necessary for Ultrasound Imaging



Survey Results: 100% of participants reported increased confidence with use of ultrasound following simulation training.

Student performance in ultrasound demonstration and written anatomy identification improved after implementation of expert-led ultrasound training and simulation practice. Survey results demonstrated improvements in perceived confidence with the use of ultrasound following simulation training.

Clinically significant improvement as demonstrated by this educational innovation project, provides a compelling statement to the University; additional simulation training should be integrated into the curriculum. Furthermore, this project opens dialogue about purchasing an ultrasound machine dedicated to the Nurse Anesthesia program.

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