

JOINT EVENT

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Effectiveness of a perioperative transthoracic ultrasound training program for students and residents

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Objectives: Focused ultrasound (US) is being incorporated across all levels of medical education. While many comprehensive US courses exist, their scope is broad, requiring expert instructors, access to simulation, and extensive time commitment by the learner. We aim to compare learning across levels of training and specialties using a goal-directed, web-based course without live skills training.

Design: A prospective observational study of students and residents from medicine, surgery, and anesthesiology. Analysis compared pre- and post-tests assessing 3 competencies. Individual mean score improvement (MSI) was compared by paired-sample t-tests and MSI between cohorts by ANOVA (Analysis of Variance), with significance set at $p \leq 0.05$. McNemar's test compared those who agreed or strongly agreed with survey items to those who did not before and after intervention.

Setting: The research study was set up at the Jackson Memorial Hospital, Miami, Florida, residency training programs in Medicine, Surgery, and Anesthesiology.

Results: 180 trainees participated. A significant MSI was noted in each of the three competencies in all three cohorts. Students' (S) MSI was significantly higher than residents' (R) & interns' (I) in US "knobology" and window recognition [$S=2.28 \pm 1.29/5$ vs $R=1.63 \pm 1.21/5$ ($p=0.014$); vs $I=1.59 \pm 1.12/5$ ($p=0.032$)]; students' total score MSI was significantly higher than residents [$7.60 \pm 3.43/20$ vs $5.78 \pm 3.08/20$ ($p < 0.008$)]. All cohorts reported improved comfort in using transthoracic US and improved ability to recognize indications for use. More than 81% of all participants reported improved confidence in performing transthoracic US; more than 91% reported interest in additional training; more than 88% believed course length was appropriate.

Conclusions: Learners across levels of medical training and specialties can benefit from a brief, goal-directed, web-based training with early incorporation producing maximal yield.

Recent Publications

1. Ray J J et al. (2017) Shake it off: a randomized study of the effect of whole body vibration in healing burn wounds. *J Burn Care Res.* 38(4):e756-e764.
2. Ray J J et al. (2017) Incidence, operative factors and outcomes associated with discretionary postoperative mechanical ventilation after general surgery. *Anesth Analg.* 126(2):489-494. Doi:10.1213/ANE.0000000000002533.
3. Ray J J and Spector S A (2016) Building a lean, mean patient care machine. *JAMA Surg.* 152(1):48. Doi:10.1001/jamasurg.2016.2834.
4. Ray J J et al. (2016) Association between American board of surgery in-training examination scores and resident performance. *JAMA Surg.* 151(1):26-31.
5. Ray J J et al. (2016) Admission hyperglycemia predicts infectious complications after burns. *J Burn Care and Res.* 38(2):85-89.

Biography

Juliet June Ray, MD, MSPH is in her 6th year of General Surgery training at the University of Miami/Jackson Memorial Hospital Program in Miami, Florida, USA. She completed a two year Research Fellowship from 2014-2016 focusing on modulating inflammatory cytokines with hypothermia in addition to clinical outcomes research in trauma/burn, vascular, and general surgery. Her passion lies in surgical innovation in training for residents and medical students. She has over 30 publications in peer-reviewed journals and has presented her research at dozens of national meetings. She will be pursuing fellowship training in Colon and Rectal Surgery after completing her last year of residency.

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