



Use of Artificial Intelligence in Cardiac Point-of-Care Ultrasound: Education Amongst Obstetric Anesthesiologists

S. Feldman, S. Johnson, R. Gessouroun, M. Fuller, Y. Bronshteyn, ML. Meng.

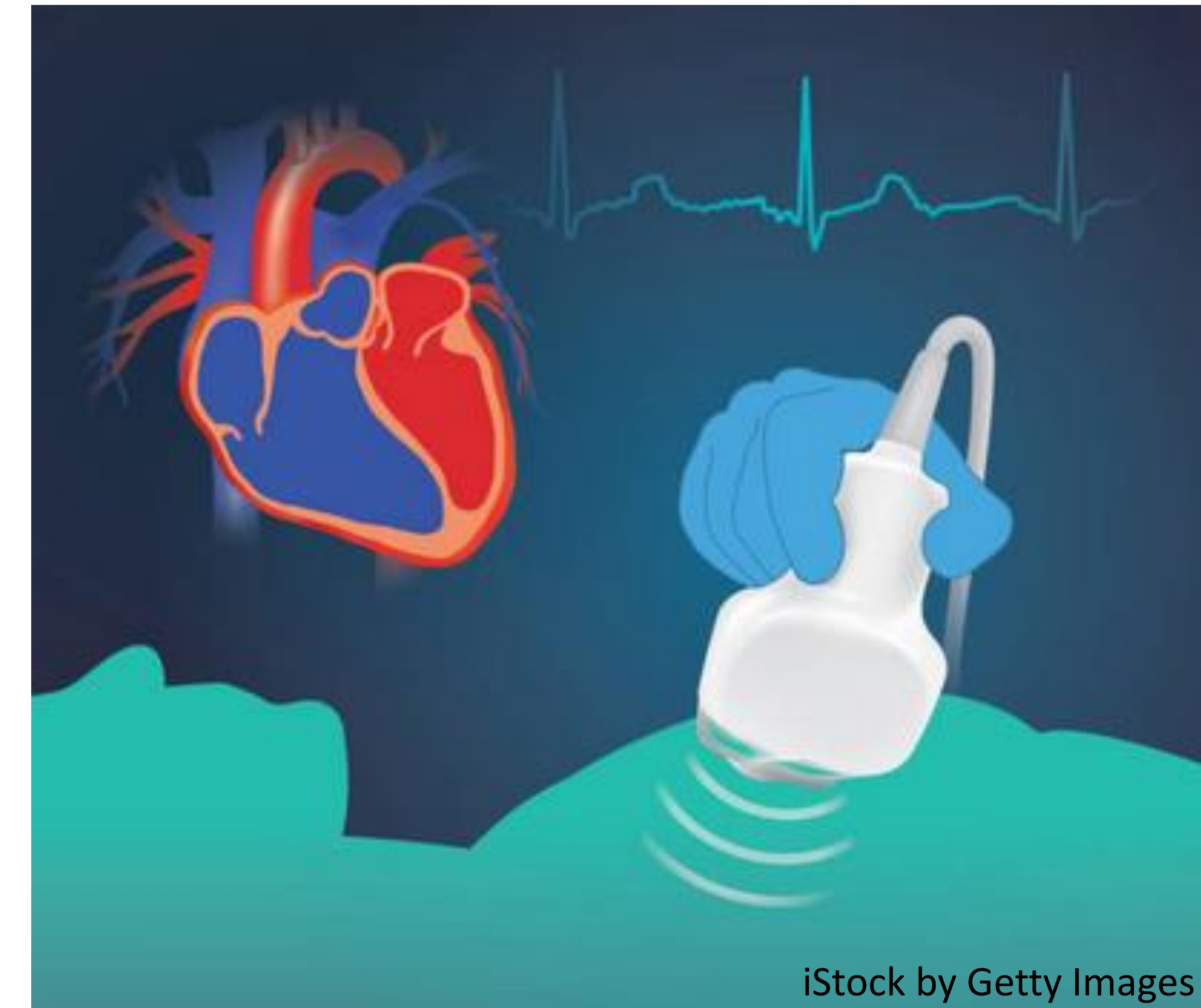
 **Duke Anesthesiology**
Duke University School of Medicine

Background

- POCUS is useful in the care of obstetric patients and a new core competency in the anesthesiology residency curriculum.^{1,2,3,4}
- Artificial intelligence (AI) in medical devices may help overcome the lack of local POCUS experts to train OB anesthesiologists.⁵

Study Aim

- To examine the association between AI-augmented training and **perception of skill** and **frequency of POCUS use** amongst obstetric anesthesiologists.



Hypothesis

Providers with AI-augmented training will perceive improved image acquisition skills and use POCUS more frequently compared with those with routine training.

Methods

Randomization

- 8 obstetric anesthesiologists and 2 obstetric anesthesia fellows randomized into two training groups:
- **AI-augmented**
- **Non-AI-augmented**

Pre-training survey

- Likert scale survey to assess self-perception of:
- **Image acquisition skill**
- **Frequency of POCUS use**

Training Curriculum

- Online learning modules
- Two 2-hour Cardiac POCUS teaching sessions:
 - -Week 1
 - -Week 6
- 20 independent exams in 8 weeks

Post-training survey

- Likert scale survey
- **Timepoints:**
 - End of the 8-week curriculum
 - 6 weeks post-training
 - 12 weeks post-training

Results

- **Perception of image acquisition skills** improved 6 weeks post-training and remained improved at 12 weeks with 80% of both groups reporting ‘good’ skills (Table 1).
- **Frequency of POCUS use** improved 6 weeks post-training in both groups. At 12 weeks, use remained ‘sometimes’ or ‘frequent’ in 60% of the AI group, but declined to 20% in the non-AI group (Figure 1).

Table 1: Likert scale self-assessments of image acquisition skills and frequency of cardiac POCUS use amongst obstetric anesthesiologists with AI-augmented training versus non-AI-augmented training

	AI Group (n=5)				Non-AI Group (n=5)			
	Pre-Training	Post-Training	6-week	12-week	Pre-Training	Post-Training	6-week	12-week
Image Acquisition Skills								
Poor	5 (100%)	0 (0%)	1 (20%)	1 (20%)	1 (20%)	0 (0%)	0 (0%)	0 (0%)
Fair	0 (0%)	2 (40%)	1 (20%)	0 (0%)	2 (40%)	1 (20%)	2 (40%)	1 (20%)
Good	0 (0%)	2 (40%)	3 (60%)	4 (80%)	2 (40%)	4 (80%)	3 (60%)	4 (80%)
Very Good	0 (0%)	1 (20%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Frequency of POCUS Use								
Never	3 (60%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Rarely	2 (40%)	1 (20%)	2 (40%)	1 (20%)	3 (60%)	1 (20%)	0 (0%)	0 (0%)
Occasionally	0 (0%)	0 (0%)	0 (0%)	1 (20%)	1 (20%)	1 (20%)	2 (40%)	4 (80%)
Sometimes	0 (0%)	3 (60%)	2 (40%)	2 (40%)	0 (0%)	2 (40%)	3 (60%)	0 (0%)
Frequently	0 (0%)	1 (20%)	1 (20%)	1 (20%)	1 (20%)	1 (20%)	0 (0%)	1 (20%)

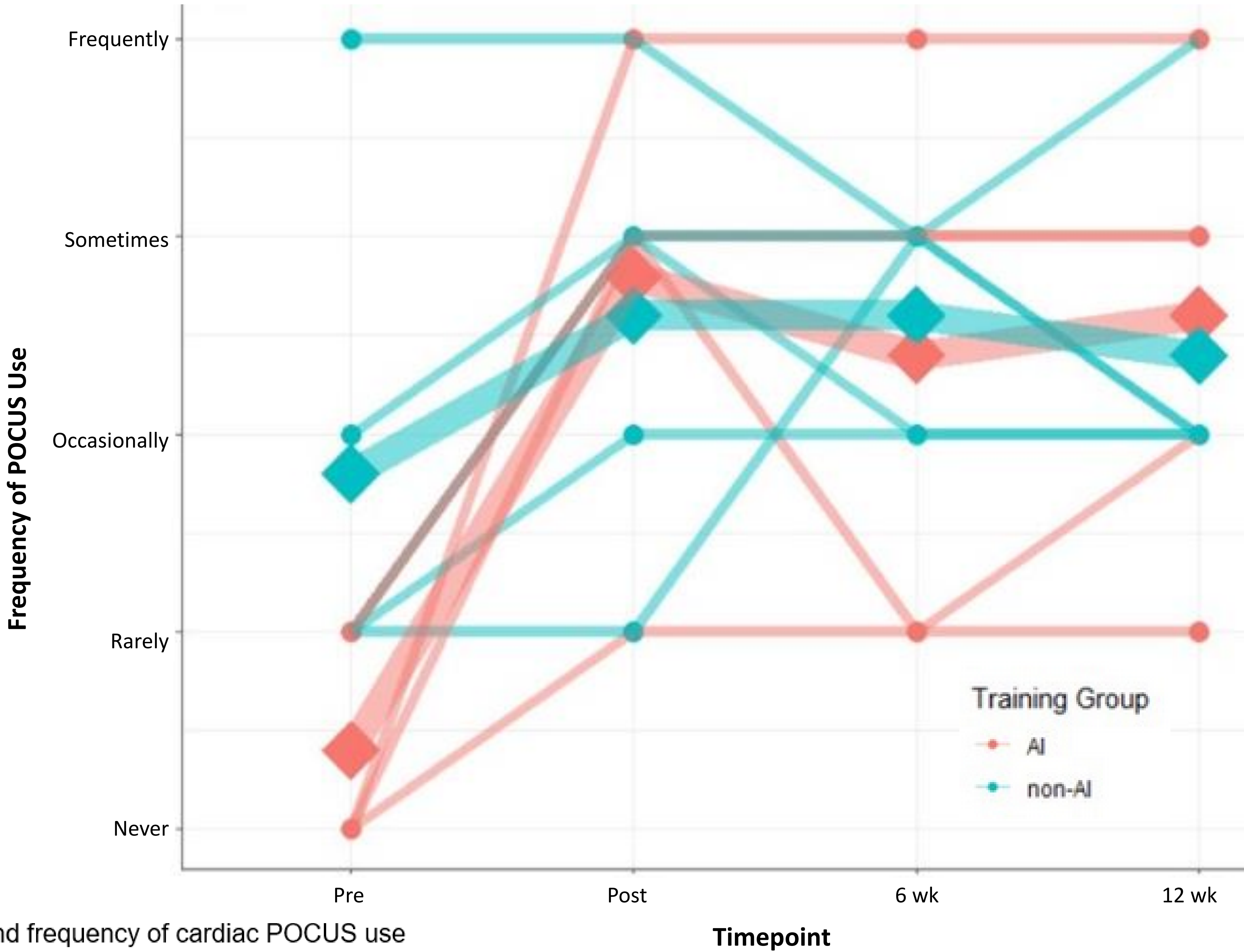


Figure 1: Plot of association between frequency of POCUS use and AI-augmented vs non-AI-augmented education. Each round dot represents a provider, and the large diamond-shaped dots represent the group averages. The lines connecting dots show the change for each individual provider. So, a positively sloped line indicates an increase while a negatively sloped line indicates a decrease.

Discussion

- Both outcomes improved regardless of use of AI, suggesting that participation in a curriculum increases confidence and use of POCUS amongst obstetric anesthesiologists.
- POCUS use was not sustained in the non-AI group at the 12-week time point, suggesting that AI training may improve long-term frequency of POCUS use.

References

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4. Zieleskiewicz L. Anaesthesia. 2018;73:1265-1279.
5. Narang A. JAMA Cardiol. 2021;6(6):624-632.