Improving internal medicine residency echocardiography skills via a 1-week elective.

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INTRODUCTION

- POCUS is increasingly utilized in internal medicine to *improve procedural safety and diagnostic skillsets*
- ECHO *competency* among internal medicine residents is *low* due to the lack of structured educational activities

METHODS

Develop a structured, one-week elective

Hands-on training (with ECHO techs), self-directed learning (via modules and POCUS) and supervised reads with Cardiology attendings

Course objectives: basic ultrasound understanding, cardiac anatomy, ventricular function, and presence or absence of pathology

Completion of pre- and post-surveys to assess competencies

RESULTS

Competency	Pre-elective	Post-elective
Determination of basic heart structures when viewing echocardiographic images	33%	75%
Labeling the standard window that is utilized when viewing echocardiographic images	67%	75%
Gross assessment of LV systolic dysfunction	67%	75%
Determination of a large pericardial effusion is present	67%	75%
Determination of intravascular volume in a patient given the findings on IVC assessment	33%	75%

Table 1. Subjective competency and confidence in ECHO image interpretation.

Pre-survey assessment	% correct	Post-survey assessment	% correct
Identification of the right atrium in apical four chamber view	100%	Identification of right ventricle in parasternal long axis view	100%
Identification of the left atrium in parasternal short axis view	67%	Identification of left atrium in subcostal inferior vena cava view	100%
Identification of subcostal inferior vena cava view	100%	Identification of apical four chamber view	100%
Identification of parasternal long axis view	100%	Identification of parasternal short axis view	100%
Identification of pericardial effusion in apical four chamber view (pathology)	100%	Identification of bicuspid aortic valve in parasternal short axis (pathology)	75%

Table 2. Objective assessment in competency in ECHO image interpretation.

CONCLUSION

Implementation of a structured echocardiography elective *increased exposure to POCUS* by ***doubling*** of the average amount of hours of practice.

Improvements to the elective would include *more challenging assessment* to determine competency and immediate feedback on the pre-survey to allow for *generative retrieval* to enhance learning.

Limitations include small sample size and a higher-than-average interest is cardiology amongst participants which may lead to increased performance on pre-elective testing when compared to an average group of residents with more diverse career interests.

Future steps: since most participants expressed an interest in repeating the elective, the **development of a second initiative is warranted** to further advance echocardiography skills among internal medicine residents.

References:

1. LoPresti CM, Jensen TP, Dversdal RK, Astiz DJ. Point-of-Care Ultrasound for Internal Medicine Residency Training: A Position Statement from the Alliance of Academic Internal Medicine. *Am J Med*. 2019;132(11):1356-1360. doi:10.1016/j.amjmed.2019.07.019
2. Kleiman AM, Potter JF, Bechtel AJ, et al. Generative retrieval results in positive academic emotions and long-term retention of cardiovascular anatomy using transthoracic echocardiography. Adv Physiol Educ. 2019;43(1):47-54. doi:10.1152/advan.00047.2018