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Trends in Point-of-Care Ultrasound Use among Emergency Medicine Residency Programs Over a 10-Year Period

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(POCUS) instruction heavily relies on resource intense bedside teaching, it is unknown whether a more flexible digital curriculum may be a viable alternative.

Objective: We aim to assess differences in trainee confidence performing less frequently encountered POCUS applications after reviewing an onsite traditional bedside instruction, remote lecture slides with written narrative or video narration.

Methods: This was an anonymous, close ended, 15 question survey study completed by emergency medicine residents and faculty at a single tertiary care teaching hospital. The survey was adapted from a validated ultrasound education study. Educational material focused on uncommon POCUS exams (scrotal, bowel, ocular). Participants were randomized to one of three training methods: onsite traditional bedside teaching, remote lecture slides with written narrative or video narration. All slides and scripts were identical. Participants rated their confidence performing and interpreting each exam type on a five-point Likert scale before and six months after the education intervention.

Results: 14 participants (five post-graduate year (PGY)1s, three PGY2s, three PGY3s and three faculty members) responded to the survey. All three education

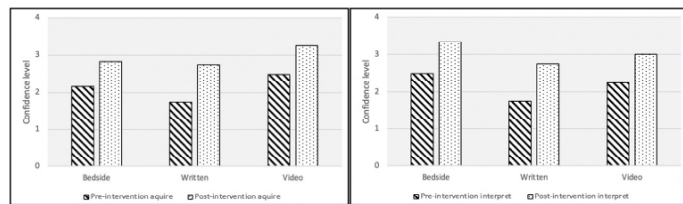


Figure 1. Level of improved confidence acquiring and interpreting POCUS scans after education intervention.

groups expressed improved confidence when acquiring and interpreting scrotal, ocular and bowel POCUS images (Figure 1). Over 75% of participants per module were likely or very likely to recommend the curriculum, with 100% being satisfied or very satisfied with their assigned module.

Conclusions: Participants had increased confidence acquiring and interpreting uncommon POCUS images after participating in bedside and distance-based education modules. Future objective assessments of traditional bedside vs remote digital POCUS curricula will need to be completed to identify if similar learning outcomes can be achieved through less resource intensive virtual methods.

60 Trends in Point-of-Care Ultrasound Use among Emergency Medicine Residency Programs Over a 10-Year Period

Michael Gottlieb, Robert Cooney, Andrew King, Alexandra Mannix, Sara Krzyzaniak, Jaime Jordan, Eric Shappell, Megan Fix

Background: Point-of-care ultrasound (POCUS) is increasingly utilized in emergency medicine (EM). While residents are required by ACGME to complete a minimum of 150 exams before graduation, the distribution of exam types is not well-described. Moreover, as the field of POCUS has advanced, the impact on resident exams performed has not been reported.

Objectives: This study sought to assess the number of POCUS exams completed during EM residency training and evaluate trends over time.

Methods: This was a retrospective review of POCUS exams across 5 ACGME accredited residency programs over the last 10 years (2013-2022). Sites were selected to ensure diversity of program length, program type, and geography. Data from EM residents graduating in 2013-2022 were eligible for inclusion. Data from residents from combined training programs, those who did not complete their full training at that institution (i.e., transferred in/out), or did not have data available were excluded. We determined the list of exam types via the ACEP guidelines for POCUS. Each site obtained POCUS exam totals for each resident upon graduation. We calculated the mean and 95% CI for each procedure.

Results: We collected data from a total of 535 residents, with 524 (97.9%) meeting inclusion criteria. The mean number of POCUS exams increased from 277 in 2013 to 407 in 2022 (Table). Focused assessment with sonography in trauma (FAST), cardiac, obstetric/gynecologic, and renal/bladder were performed most frequently. Ocular, skin/soft tissue, and thoracic POCUS had the largest increase in

Table. Distribution of ultrasound numbers by graduation year.

Year of Graduation	Acute Care EM CP	Emergency Medicine CP	EM CP	Other CP	EM CP	EM CP	EM CP	EM CP	EM CP	EM CP	EM CP	EM CP	EM CP	EM CP	EM CP	EM CP	EM CP	TOTAL
2013	28 (0-37)	8 (0-5)	25 (12-39)	38 (28-49)	9 (3-15)	67 (37-95)	7 (4-10)	41 (28-53)	4 (0-4)	25 (20-30)	11 (7-14)	0 (0-0)	12 (7-18)	277 (228-326)				
2014	19 (12-28)	8 (0-5)	22 (17-27)	31 (24-37)	11 (7-14)	69 (53-79)	9 (3-12)	39 (27-49)	7 (4-9)	28 (23-33)	11 (7-14)	0 (0-0)	11 (7-14)	282 (231-333)				
2015	28 (20-37)	2 (0-2)	26 (20-32)	47 (38-55)	15 (10-20)	88 (68-102)	10 (7-13)	39 (28-49)	7 (0-7)	31 (24-37)	13 (8-18)	0 (0-0)	22 (17-28)	323 (269-377)				
2016	28 (20-38)	1 (0-1)	23 (18-28)	28 (20-36)	13 (9-18)	77 (61-92)	10 (7-13)	39 (28-49)	18 (12-24)	29 (23-35)	14 (8-20)	1 (0-1)	24 (18-30)	325 (274-376)				
2017	19 (12-28)	1 (0-1)	21 (16-27)	40 (32-48)	11 (8-14)	54 (41-68)	9 (3-12)	38 (28-48)	7 (0-8)	27 (20-35)	12 (8-16)	0 (0-0)	13 (8-18)	277 (228-326)				
2018	11 (7-14)	2 (0-2)	24 (18-30)	30 (23-37)	22 (15-29)	70 (57-83)	9 (3-12)	39 (28-49)	11 (7-14)	29 (23-35)	26 (17-34)	1 (0-1)	27 (20-34)	341 (291-391)				
2019	28 (21-36)	1 (0-1)	25 (20-30)	128 (104-150)	19 (13-25)	128 (104-150)	25 (17-32)	38 (28-48)	18 (12-24)	41 (34-48)	31 (24-37)	1 (0-1)	22 (16-28)	420 (370-470)				
2020	29 (21-38)	2 (0-2)	28 (22-34)	31 (24-38)	16 (12-20)	77 (61-92)	11 (7-14)	38 (27-48)	22 (16-28)	32 (26-38)	26 (18-34)	0 (0-0)	16 (12-20)	376 (325-427)				
2021	29 (21-38)	2 (0-2)	29 (23-35)	77 (69-87)	19 (14-24)	81 (68-92)	12 (9-15)	36 (26-46)	11 (7-14)	38 (31-45)	22 (15-29)	0 (0-0)	19 (14-24)	385 (335-435)				
2022	28 (20-36)	2 (0-2)	29 (23-35)	19 (14-24)	28 (17-38)	79 (62-94)	17 (12-22)	41 (32-49)	12 (8-16)	31 (24-37)	22 (15-29)	0 (0-0)	18 (13-23)	407 (357-457)				
TOTAL	39 (29-49)	1 (0-1)	27 (22-32)	47 (40-55)	18 (14-21)	74 (59-89)	13 (9-17)	77 (64-89)	11 (8-14)	24 (19-29)	23 (16-30)	0 (0-0)	18 (13-23)	349 (299-399)				

numbers over the 10-year period, while bowel and testicular POCUS remained rare.

Conclusions: We highlighted the number of specific POCUS exams performed by EM residents overall and identified trends over a 10-year period. Data were limited by the retrospective nature and inability to capture non-saved exams unless reported by residents. This information can inform POCUS training in residency and accreditation.

61 Unhewn Student Experience: Considering Heuristics in Emergency Clinical Knowledge – A Preliminary Report

Andrew Monick, Xiao Chi Zhang

Background: Diagnostic error continues to detract from patient safety and incur high costs. Cognitive bias is a key source of diagnostic failure. The framing effect poses a particular challenge to emergency physicians (EPs) since quality and sequence of information varies profoundly between cases. The extent to which individual factors augment or reduce susceptibility to the framing bias is unclear, and the role of professional expertise in particular is contested and varies across literature.

Objectives: This study aimed to investigate the effects of the framing bias on diagnostic reasoning given varying levels of clinical knowledge and experience. We anticipated that effects attributable to frame would be mediated by years of medical education completed.

Methods: This was a single-blind experimental study conducted at an academic medical center. 183 medical students were recruited in 2022. Our inclusion criterion was current enrollment at Thomas Jefferson University as a second to fourth year medical student. Students were randomly assigned to review one of two versions of a case vignette consistent with pulmonary embolism (PE). The two versions contained objectively identical clinical data but varied in frame; where one emphasized features consistent with PE, the other did not. Subjects provided their top three differential diagnoses.

Results: Likelihood of identifying of PE differed based upon the frame to which participants were exposed ($p = 0.000$, $df = 1$, $\phi = 0.392$). This effect held upon subgroup analysis of each class year. As academic standing advanced, a greater proportion of respondents within the frame-toward condition identified PE as a diagnosis of interest ($p = 0.001$, $df = 2$, $\phi = 0.344$).

Conclusions: Our results suggest that cognitive frame may influence diagnostic reasoning, and the extent to which it does is mediated by clinical experience. These findings can inform future medical education initiatives, particularly within EM.

62 Longitudinal Cricothyrotomy Competency Among Residents

Andrew Hybarger, Joseph Turner, Lauren Stewart, Dylan Cooper

Background: Cricothyrotomy is a high-stakes emergency procedure. Because the procedure is rare, simulation is often used to train residents. The ACGME requires performance of three cricothyrotomies, during residency, but the optimal number of training repetitions is unknown. Additional repetitions beyond three could increase proficiency, though it is unknown whether there is a threshold beyond which there is no benefit to additional repetition.

Objective: The objective of this study was to establish a minimum number of cricothyrotomy attempts beyond which additional attempts did not increase proficiency.

Methods: This was a prospective, observational study conducted at the simulation center of an academic emergency medicine residency program. Participants were first- and second-year residents participating in a longitudinal airway curriculum during consecutive years. The primary outcome was time to successful completion of the procedure. In 2020, R1-residents were timed by a trained study investigator during sequential cricothyrotomy attempts. In 2021, first- and second-year residents were similarly timed. Procedure times were plotted as a function of attempt number. Data was analyzed using T-tests, correlation analysis, and repeated measures ANOVA. Pre-procedure surveys collected further data regarding procedure experience and comfort.

Results: Forty-one first-year residents participated in the study. Steady improvement in time to completion was seen through the first five attempts with leveling off following the fifth attempt. Results can be seen in Image 1 and Image 2.

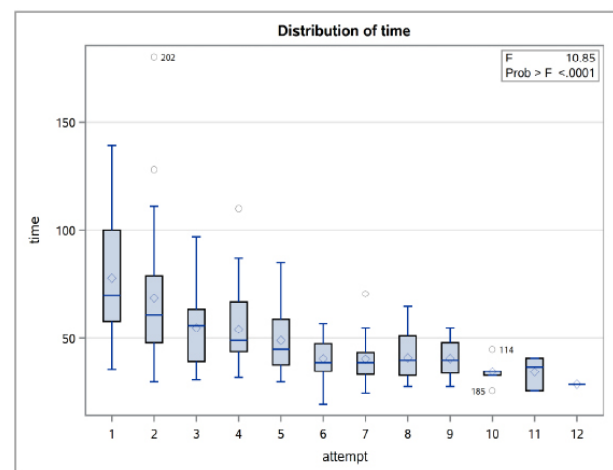


Image 1.