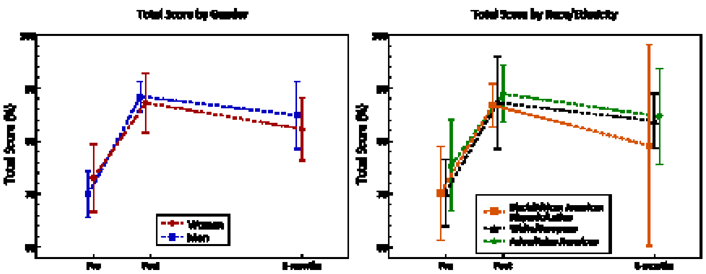
p<.001), post-training mean 81 (95%CI 5–14, p<.001), and 6-months mean 81 (95%CI -10 to– -2, p=.007). No significant differences were observed by gender or race.

Conclusion: Our stakeholder-driven intervention improved comfort addressing microaggressions and discrimination in the emergency department, with sustained effects at 6 months. This model highlights the value of participatory design and targeted training to foster equity in emergency medicine.



76 A Free Smartphone Application Teaches the Motor Skills of the Head Impulse Test

Jacob Lenning, Samuel Westendorf, Ryan Luedtke, Jeffrey Kline, Anne Messman

Background: The accuracy of the HINTS (head impulse test, nystagmus, and test of skew) exam is limited by the difficult head impulse test (HIT), which requires head turns of 10-15 degrees at >100 degrees/second. Feedback training with expensive video-oculography (VOG) devices and virtual simulators has been used for motor skill development.

Objective: Determine if visual feedback from the free PhyPhox smartphone application displaying rotational velocity can teach the motor skills of the HIT.

Methods: A convenience sample of twenty inexperienced medical students performed 20 HITs on a mannequin model before, immediately after, and 2-weeks following a training session. A VOG device without feedback recorded successful head turns (Figure 1). Participants were randomly assigned to perform 100 training attempts with VOG auditory feedback (n=10) or smartphone application visual feedback (n=10; Figure 1). Aggregate learning curves were constructed from the training sessions (Figure 2). Plateaus were determined by linear regression. Group success rates (total successes per attempts) were compared with Pearson's chi-square tests (df=1, n=400).

Results: Learning curves plateaued at 43 attempts for the smartphone group and 60 for the VOG group with no statistical differences in the success rates at any number of attempts (Figure 2). Success rates improved from before to immediately after training for the smartphone (0.14 [0.10, 0.20]; 0.47 [0.40, 0.54]; p<0.01) and VOG (0.06 [0.03, 0.10]; 0.38 [0.40, 0.54]; p<0.01) groups. Success rates between groups differed before and after training (p<0.01), though absolute differences were small in this limited sample size. The success rate was worse at the 2-week follow-up (0.25 [0.20, 0.31]) than immediately after training (0.47 [0.40, 0.54]; p<0.01) for the smartphone group, but unchanged for the VOG group (0.40 [0.33, 0.47]; 0.38 [0.32, 0.45]; p=0.68).

Conclusion: Students learned the motor skills of the HIT with similar speed and proficiency using either a smartphone application or VOG, but had better skill retention with video-oculography. The results demonstrate teaching potential for a low cost, specialized smartphone application that can provide rotational velocity feedback to support development of the motor skills needed to perform the head impulse test.

Figure 1. (A) Training model with video-oculography (VOG) device and smartphone placement. (B) Interface of the smartphone application displaying rotational velocity.

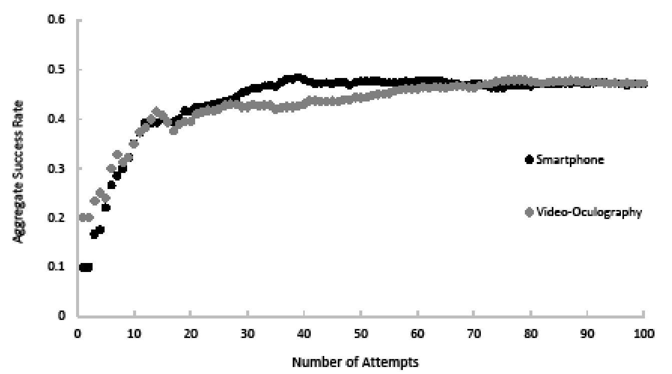


Figure 2. Aggregate head impulse test learning curve for the free PhyPhox smartphone application group (n = 10) and the video-oculography (VOG) group (n = 10).

77 Reimagining Resident Research: A Qualitative Study of Residents who Struggled to Complete Their Scholarly Project

Ridhima Ghei, Jeremy Shin, Lynn Jiang, Jaime Jordan, Keith Willner

Background: The scholarly activity requirement by the ACGME is broad and variably applied by residency programs. Guidance in the literature includes a systematic review that encapsulates the initiatives used by GME programs to increase scholarly activity. Additionally, a qualitative study interviewed EM residents who excelled in scholarship to discern the factors leading to success. To date, no qualitative studies have explored the perspectives of residents who struggle to meet this requirement.

Objectives: This qualitative study aims to explore the perspectives of residents who self-identified as facing difficulty completing the scholarly project.

Methods: We performed a qualitative study using a constructivist paradigm and conducted semistructured interviews at 4 American ACGME-accredited emergency medicine residency programs. We invited residents who self-identified as struggling with scholarship. Two researchers independently performed a thematic analysis of interview transcripts. Discrepancies were resolved through in-depth discussion and negotiated consensus.

Results: 13 residents consented to be interviewed. Many had participated in scholarship before residency. Major themes identified were: barriers to scholarly project development, advice to programs, and advice to residents. Barriers to scholarly productivity included lack of: time, perceived value of scholarship, clarity around the requirement, infrastructure, skills, and mentorship. Suggestions for residency programs included setting clear expectations, providing infrastructure, and facilitating mentorship. Participants' advice to residents included starting early and seeking a quality mentor.

Conclusions: Our analysis reveals that even residents with prior experience in scholarship can struggle to complete the scholarly project required in residency. Our participants highlight challenges to completing the scholarly project requirement and recommend strategies at multiple levels to help residents succeed. [This was completed as our group project for the MERC at CORD Program]

78 Artificial Intelligence May Benefit Experienced Users More than Novices in Point-Of-Care Ultrasound Acquisition

Jacob Lenning, Corey Garrison, Paul Thanel, Aaron Mahoney

Background: There is limited evidence defining the role of artificial intelligence (AI) guidance in point-of-care ultrasound (POCUS) education. It unknown for which learners and for which POCUS studies AI guidance is most immediately helpful due to an absence of prior repeated-measure studies.

Objective: Determine the immediate effect of AI guidance on POCUS acquisition time and image quality in novice and experienced users.

Methods: A repeated-measure experimental study was conducted in a simulated setting. A convenience sample of 14 novice users with limited POCUS training during medical school and 10 experienced emergency medicine residents recorded right upper quadrant (RUQ) abdominal and apical-4 chamber (A4C) cardiac windows with and without AI guidance on three standardized patients in randomized order. Acquisition times were compared with the Mann-Whitney U test. Three blinded reviewers assigned Boolean values for the quality criteria: essential structures visible, correct imaging plane, and proper probe orientation. Quality criteria proportions were compared with Pearson's chi-square for independent samples and McNemar's test for repeated measures.

Results: 286 ultrasounds were recorded. Median [interquartile range] acquisition time (seconds) was longer with AI than without for A4C (117 [125]; 69 [62]; p<0.01) and RUQ (61 [64]; 38 [38]; p<0.01) windows in all users (Table 1). All A4C and RUQ quality criteria were more likely in experienced

Table 1. Median (Interquartile Range; IQR) time in seconds to acquire ultrasound windows with and without Artificial Intelligence (AI) by study group. P-values from the Mann-Whitney U test. *Four RUQ timing videos without AI missing for analysis.

Study Group	Right Upper Quadrant Window			Apical-4-Chamber Window		
	Number of Recordings	Median (IQR) Seconds	p	Number of Recordings	Median (IQR) Seconds	p
All Participants	140*	52 (58)	-	144	91 (88)	-
Novice Users	80*	69 (72)	**<0.01**	84	104 (89)	**0.04**
Experienced Users	60	34 (30)		60	74 (74)	
All Participants With AI	72	61 (64)	**<0.01**	72	117 (125)	**<0.01**
All Participants Without AI	68	38 (38)		72	69 (62)	
Novice Users With AI	42	85 (91)	**<0.01**	42	136 (109)	**<0.01**
Novice Users Without AI	38*	53 (59)		42	75 (66)	
Experienced Users With AI	30	44 (29)	**<0.01**	30	98 (132)	0.18
Experienced Users Without AI	30	28 (21)		30	66 (47)	

Table 2. (A) Proportion of recordings meeting quality criteria by ultrasound (US) window and experience level. **(B)** Likelihood the total number of criteria was greater with or without artificial intelligence (AI) and proportions for each criterion by US window and study group. P-values from McNemar's test for repeated measures unless noted. [#]Pearson's chi square test. [$]Fisher's exact test. *One A4C and RUQ recording without AI missing for analysis.

(A)		Right Upper Quadrant Window				Apical-4-Chamber Window			
		Proportion [95% CI]		X^2 (df=1)		Proportion [95% CI]		X^2 (df=1)	
Group	Quality Criteria	Novice	Experienced	n	p	Novice	Experienced	n	p
All Recordings	Essential Structures	0.65 [0.54,0.74]	0.92 [0.81,0.97]	143	**<0.01**[#]	0.58 [0.47,0.68]	0.77 [0.64,0.86]	143	**0.02**[#]
	Imaging Plane	0.58 [0.47,0.68]	0.78 [0.66,0.87]		**0.01**[#]	0.22 [0.14,0.32]	0.48 [0.36,0.61]		**<0.01**[#]
	Probe Orientation	0.78 [0.68,0.86]	0.97 [0.88,1.00]		**0.02**[#]	0.41 [0.31,0.52]	0.73 [0.61,0.83]		**<0.01**[#]

(B)		AI	WO	-		AI	WO	-	
All Users	Greater # of Criteria	0.23 [0.15,0.35]	0.20 [0.12,0.31]	142	0.37[#]	**0.35** [0.25,0.47]	**0.20** [0.12,0.32]	142	**0.04**[#]
	Essential Structures	0.75 [0.63,0.83]	0.78 [0.67,0.86]	71	0.62	0.69 [0.58,0.79]	0.62 [0.50,0.72]	71	0.32
	Imaging Plane	0.65 [0.53,0.75]	0.68 [0.57,0.78]		0.64	**0.40** [0.30,0.52]	**0.25** [0.16,0.36]		**0.02**
	Probe Orientation	0.89 [0.79,0.94]	0.83 [0.73,0.90]		0.29	0.56 [0.44,0.66]	0.54 [0.41,0.64]		0.85
Novice Users	Greater # of Criteria	0.29 [0.18,0.45]	0.24 [0.14,0.40]	83	0.62[#]	0.32 [0.20,0.47]	0.20 [0.10,0.34]	83	0.21[#]
	Essential Structures	0.63 [0.48,0.76]	0.67 [0.51,0.79]	41*	0.78	0.57 [0.42,0.71]	0.59 [0.43,0.72]	41*	0.80
	Imaging Plane	0.54 [0.39,0.68]	0.62 [0.47,0.75]		0.37	0.26 [0.15,0.41]	0.17 [0.08,0.32]		0.21
	Probe Orientation	0.83 [0.68,0.92]	0.74 [0.59,0.85]		0.25	0.43 [0.29,0.58]	0.39 [0.26,0.54]		0.80
Experienced Users	Greater # of Criteria	0.17 [0.07,0.34]	0.13 [0.05,0.30]	60	1[$]	0.40 [0.24,0.58]	0.20 [0.09,0.38]	60	0.09[#]
	Essential Structures	0.90 [0.73,0.97]	0.93 [0.77,0.99]	30	0.56	0.87 [0.70,0.95]	0.67 [0.49,0.81]	30	0.06
	Imaging Plane	0.80 [0.62,0.59]	0.77 [0.59,0.88]		0.71	**0.60** [0.42,0.75]	**0.37** [0.22,0.55]		**0.03**
	Probe Orientation	0.97 [0.82,1.00]	0.97 [0.82,1.00]		1.00	0.73 [0.55,0.86]	0.73 [0.55,0.86]		1.00