

## 12 Do Residents Need More Training on Head CT Imaging Interpretation? A Multicenter Needs Assessment

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**Aim:** We sought to determine if emergency medicine (EM) residents require further training in interpreting head CTs through a needs assessment. We hypothesized that residents gain confidence with increasing PGY-level and those who use PACS-windows and structured approaches are likely more confident in their interpretations.

**Background:** Head CTs are often interpreted by EM residents, however most do not have formal training. Studies have reported concordance between EM physicians and radiologists to be as low as 65%.

**Methods:** We performed a needs-assessment survey across two EM training programs. The survey was created by the Vice Chairs of Education of EM and Radiology, providing face validity. Elements included PGY-level, confidence level in accurately interpreting head CTs, use of PACS-windows, and desire for more training. The survey was piloted by graduating EM residents prior to study launch. Program Directors at each institution distributed the survey to their respective residents. Standard statistical methods, including student's t-test, were utilized to analyze the data. Study was IRB approved.

**Results:** Among 75 total residents, we received 71 responses (95%). On average, residents reported confidence in interpreting 57% of head CTs; 70% used PACS-windows; 48% had a structured approach. There were significant increases in confidence from PGY-1 (45%) to PGY-2 (65%) and PGY-3 (66%) levels. Residents who had structured approaches were more confident (62%) than residents who did not (51%,  $p < 0.05$ ). There was no significant relationship between confidence and use of PACS-windows. Of the 71 respondents, 99% reported a desire for more training.

**Conclusion:** Self-reported confidence of residents is low (~60%), and virtually all desire further training. Confidence increases with PGY-level and the use of structured approaches, suggesting that early training with tools such as checklists has the potential to improve resident confidence, and potentially skill.

## 13 Does Gamification Improve Medical Knowledge of 4th-Year Medical Students as Measured by the EM NBME?

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**Background:** Gamification increases learners' motivation and engagement by using game design elements. Although

gamification appears to have a positive impact on education, there is little evidence to support that it improves medical knowledge.

**Purpose:** The purpose of this study is to assess the impact of gamification on the medical knowledge of 4th-year medical students during their EM Clerkship as assessed by the EM NBME.

**Methods:** A pre-post experimental design compared EM NBME scores of 4th-year EM clerkship students at a Midwestern school before (May 2019-April 2021,  $n=323$ ) and after (May 2021-April 2022,  $n=132$ ) the implementation of a one-hour gamified review session. Sessions included 20 cardiology and pulmonology questions. Inferential statistical techniques were used to compare two groups. Data analyses were carried out using SPSS 28.0. Post-session evaluation comments were analyzed for themes.

**Results:** The cohorts were approximately equal as measured by the Levene Test. Post-intervention scores improved in both the Cardiology and Pulmonary subsections of the EM NBME, however they were not found to be statistically significant ( $p = 0.32, 0.32$ , Table 1). Overall test scores improved post-intervention and were statistically significant ( $p = 0.005$ , Table 1). Themes identified in student responses included that the session was helpful, interactive, fun, and engaging (Table 2).

**Conclusion:** The gamification cohort had higher exam scores indicating gamification improves medical knowledge and can be used as a method to enhance review sessions. Findings showed improvement, though not significant, in the cardiology and pulmonary subsections, indicating the need for further analysis of all subsections. Student comments reflected positively on learner engagement which is consistent with prior

**Table 1.** EM NBME scores with and without gamification intervention.

		Gamification Intervention		<i>p</i>
		With	Without	
Overall Exam	<i>n</i>	132	323	0.005*
	<i>M</i>	81.63	79.34	
	<i>SD</i>	6.61	8.32	
Cardiovascular Subsection	<i>n</i>	132	323	0.32
	<i>M</i>	79.44	78.2	
	<i>SD</i>	11.70	12.29	
Pulmonary Subsection	<i>n</i>	132	323	0.32
	<i>M</i>	81.70	80.43	
	<i>SD</i>	11.26	12.60	

**Table 2.** Select post-evaluation responses from 4<sup>th</sup> year medical students who completed the gamification review service.

Helpful	"The cases were helpful examples of questions that could come up" "Followed up by supplemental educational slides which was also a helpful review of diagnostic tests and workup for specific conditions" "The practice questions were helpful shelf exam prep" "...did a great job of explaining why each answer was incorrect, which was very helpful." "This was a very helpful learning session."
Engaging/Interactive	"I liked the 'quiz' style format because it was more engaging instead of just listening to a lecture" "Encouraged engagement from students." "Trivia style review sessions are always fun and engaging" "Interactive and engaging - Comprehensive" "Engaged, laid back but still teaching high yield topics well." "The interactive quiz format was engaging." "was more interactive than the usual lecture style review session"
Fun	"Great, fun interactive Q&A quiz session" "Extremely fun and useful!" "This was a great, enjoyable and interactive review session that I found very helpful!"