

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 4th 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!"

studies. Limitations include convenience sampling and that the gamification session was held in addition to the standard curriculum which includes cardiology and pulmonology.

14 Does Inclusion of Residents in EKG screening in the ED change the Time to Catheterization Lab Activation?

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Background: A significant amount of research has gone into EKG interpretation training modalities for emergency medicine residents, but few high-powered studies exploring the accuracy of resident EKG interpretation exist.

Objectives: This study aims to evaluate whether or not the inclusion of PGY-3 EKG interpretations is non-inferior to attending-only EKG interpretations in regards to timely STEMI activation.

Methods: This is a retrospective non-inferiority study of STEMI activation times before and after the inclusion of PGY-3 resident EKG interpretations performed at an academic, urban tertiary care center between November 2020 and April 2022, excluding pre-hospital activations. The primary endpoint is the proportion of STEMI activations within five minutes of EKG completion; time window chosen to account for operator delay. An absolute decrease of 10% between before and after inclusion of resident EKG interpretations was chosen as the non-inferiority margin.

Results: 39 STEMI activations occurred from November 2020 to July 2021 prior to resident inclusion in the reading of EKGs. 40 STEMI activations occurred from August 2021 to April 2022 after resident inclusion. In the attending-only period, 26 (66.7%) cases resulted in STEMI activation within 5 minutes of the initial EKG being obtained compared to 31 cases (77.5%) in the post-resident period. The absolute difference between groups' successful activations shows an increase of 11%, which lies within the non-inferiority margin (delta +11%, 95% CI

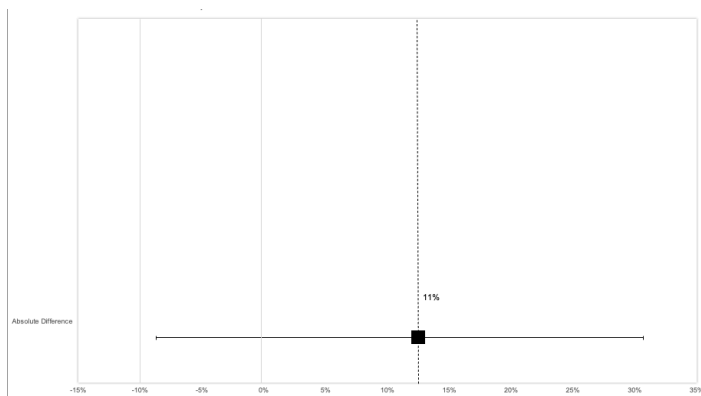


Figure. Difference in proportion of successful STEMI activations post- and pre- resident inclusion.

-8.68%, 30.7%). The proportion of STEMI activations within 5 minutes did not differ by resident reading, $X^2 = 1.15$, $p = 0.28$.

Conclusion: Based on our data, we can conclude that including Emergency Medicine PGY-3 residents in reading EKGs is non-inferior to attending-only interpretation of EKGs with regard to STEMI activation time.

15 Effects of Wellness Credits on Resident Physician Burnout

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Background: There is extensive literature on physician burnout showing that it correlates with individual mental and physical illness, leads to adverse patient outcomes, and is financially costly to health systems. Further, understanding physician burnout is a step towards improving physician wellness. Investments in physician wellness nationwide have occurred in a broad assortment of ways; however the literature does not present wellness funds to residents as a previously studied approach.

Objective: Our goal was to study the impact of wellness credits on resident burnout and assess residents' overall perspective of the intervention on their daily wellness. We hypothesize a decrease in burnout and an overall positive assessment of the program by involved residents.

Methods: In the Fall of 2021, the University of Chicago EM Residency program began to give financial stipends during the most difficult rotations as a novel approach to mitigating resident burnout. This was a quasi-experimental, prospective study investigating the impact of stipends on EM resident burnout. Following the intervention, a post-intervention survey was sent to residents to assess perspectives on the initiative.

Results: 36/49 residents (73%) responded to the survey. Over half of residents "often" or "always" (42%, 8%, respectively) had difficulty completing daily chores, and 72% of residents used more than half or all of the gift cards for such chores. In turn, 74% of residents "agree" or "strongly agree" that the initiative benefits their overall wellness." Finally, 100% of respondents would like to see the initiative continue.

Table.

Survey Question	Survey Response	Response Rate	Percentage
In the last academic year (2021-2022), how often have you experienced difficulty completing daily chores and/or fulfilling housekeeping requirements? (i.e. cleaning, walking pets, dry cleaning, meal preparation, meal/grocery delivery, etc.	Sometimes	14/36	39%
	Often	15/36	42%
	Always	3/36	8%
How much of the gift card did you intend to use for the items referenced above?	More than half or All	26/36	72%
The financial value provided by the Wellness Gift Card was adequate to support the items referenced above	Agree or Strongly agree	12/35	34%
My overall wellness benefited from the Wellness Gift Card initiative	Agree or Strongly Agree	26/35	74%
Would you like to see the Wellness Gift Card continued into the next academic year?	Yes	36/36	100%