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Education Research

Title

Developing a Pilot Radiology Curriculum catered to the Yale University School of Medicine Primary Care Clerkship (PCC)

Authors

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Background: Knowledge of medical radiation safety and evidence based imaging (EBI) guidelines is essential for primary care physicians to appropriately order imaging studies. Previous studies have demonstrated a lack of understanding amongst medical students with regards to radiation safety and EBI guidelines. Currently, medical students at Yale have no formal exposure to these topics.

Objective: Assess the impact of implementing a pilot radiology curriculum, consisting of topics on radiation safety and EBI guidelines, for senior medical students rotating through their PCC.

Methods: Radiation safety and EBI guidelines workshops were created for this pilot project. Pre-tests were given before both workshops. The radiation safety workshop consisting of 5 test questions and 4 additional survey questions. The EBI workshop consisted of 10 case scenarios requiring the students to order the next best imaging step (guidelines were adapted from the American College of Radiology appropriateness criteria). An additional 4 survey questions were also included. Approximately 3 weeks after the workshops, post-tests were given to all the students. Responses to the pre and post test radiation safety questions as well as the 10 clinical case scenarios from the EBI workshop were evaluated via the Chi-squared test to assess if the workshops had a significant impact on the number of correct responses. Chi-squared test was also to assess whether the EBI workshop had a significant impact to the question "I am aware of the ACR (ACR) appropriateness criteria"

Results: Regarding the pre-test radiation safety survey: 54/70 (77%) of students were either unaware or could not remember if they had a lecture on this topic. 60/70 (86%) of students thought that radiation exposure is either a "very important" or "somewhat important" consideration when ordering radiology studies for their patients. Evaluation of the test questions revealed a statistically significant improvement in correct responses in 3/5 questions. Post-test survey demonstrates that 31/32 (97%) students feel more confident discussing the radiation risk of imaging studies with their patients. Regarding the EBI test survey: 42/53 (79%) students were unaware of the ACR appropriateness criteria while 38/53 (72%) were either unsure or could not remember if they had a lecture on this topic. Evaluation of the case scenarios demonstrated a statistically significant improvement in correct responses in 5/10 questions. Post-test survey demonstrates that 30/31 (97%) students are aware of the ACR appropriateness criteria and that 27/31 (87%) plans to use this resource in their future career.

Conclusions: There is a lack of formal education on topic of radiation safety and EBI guidelines during medical school. Implementation of a formal curriculum to address these deficiencies can improve these knowledge gaps.

References

1. Koontz, Nicholas A., and Richard B. Gunderman. "Radiation safety and medical education: development and integration of a dedicated educational module into a radiology clerkship, outcomes assessment, and survey of medical students' perceptions." *Academic radiology* 19.4 (2012): 491-497.
2. Dillon, Johanne E., and Priscilla J. Slanetz. "Teaching evidence-based imaging in the radiology clerkship using the ACR appropriateness criteria." *Academic radiology* 17.7 (2010): 912-916.
3. Saha, Arnold, et al. "Radiology medical student education: an outcome-based survey of PGY-1 residents." *Academic radiology* 20.3 (2013): 284-289.
4. Zhou, G. Z., et al. "Student and intern awareness of ionising radiation exposure from common diagnostic imaging procedures." *Journal of medical imaging and radiation oncology* 54.1 (2010): 17-23.
5. Mubeen, Syed Mohammed, Qamar Abbas, and Nighat Nisar. "Knowledge about ionising and non-ionising radiation among medical students." *J Ayub Med Coll Abbottabad* 20.1 (2008): 118-121