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Best of Best Research and Innovation Abstracts

1 Facilitating Adaptive Expertise in Learning Computed Tomography, A Randomized Controlled Trial

Leonardo Aliaga, Rebecca Bavolek, Benjamin Cooper, Amy Matson, James Ahn, Aaron Kraut, David Duong, Mike Gisondi

Background: Adaptive expertise is the ability to transfer existing skills to novel situations. Error Management Training (EMT) improves transfer of skills and adaptive expertise by making learners solve difficult problems and produce errors before being shown how to solve them. While EMT been used in procedural skills training, its impact on transfer of cognitive skills in medical training is underexplored.

Objective: To compare the effects of EMT and Error Avoidance Training (EAT) on the transfer of cognitive skills, using head computed tomography (CT) interpretation as a model. We hypothesized that EMT, compared to EAT, would improve skills transfer when used to teach head CT interpretation to emergency medicine (EM) residents.

Methods: We conducted a prospective, randomized controlled study in six EM residency programs. Residents completed an online head CT curriculum using either an EMT or EAT strategy, followed by a head CT interpretation test we previously validated. Two experimental cohorts (EMT-1 and EMT-2) scrolled through head CT cases without guidance and tried to identify critical findings before receiving didactic explanation. The EMT-1 cohort encountered difficult questions leading to errors whereas EMT-2 encountered easy questions. The EAT cohort received didactic instruction before scrolling through head CT cases. The post-test included novel cases to assess transfer and familiar cases to assess direct application. Our primary outcome was transfer of head CT interpretation skill. We compared post-test scores by ANOVA.

Results: We enrolled 119 residents (Table). The EMT-1 cohort outperformed both EMT-2 and EAT cohorts on the novel cases assessing transfer, with a large effect size (Figure). There was no difference on the direct application cases.

Conclusions: EMT improves transfer of head CT interpretation skill. These findings support its efficacy to develop adaptive expertise with other cognitive skills in EM education.

Table. 119 residents completed intervention and post-test.

	EMT-1	EMT-2	EAT
Total	36	41	42
PGY-1	14	13	12
PGY-2	10	13	14
PGY-3	10	12	11
PGY-4	2	3	5

EMT = Error Management Training
EAT = Error Avoidance Training

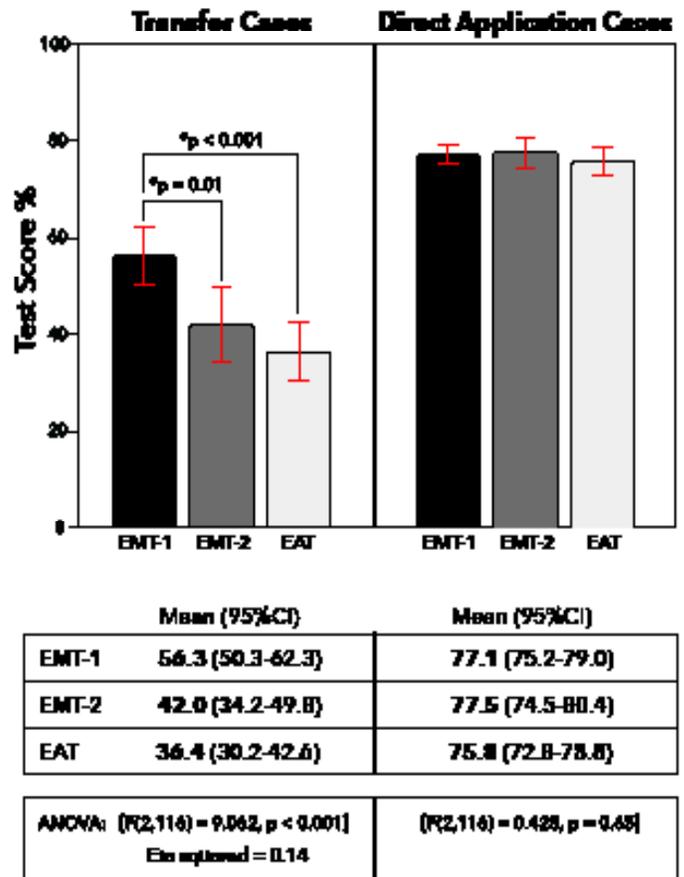


Figure. The FAIL CT study: a multicenter randomized controlled trial.

*Tukey's Test used for post-hoc comparisons
FAIL, facilitating adaptive expertise in learning computed tomography; EMT, error management training; EAT, error avoidance training.

2 Trends in Emergency Medicine Resident Procedural Reporting Over a 10-Year Period

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

Background: Procedural competency is expected of all emergency medicine (EM) residents upon graduation. The ACGME requires a minimum number of essential procedures to successfully complete training. However, data are limited on the actual number of procedures residents perform and prior studies are limited to single institutions over short time periods.

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

Methods: We conducted a retrospective review of EM resident procedure totals across 8 ACGME accredited residency programs over the last 10 years (2013-2022). Sites were selected