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Development of a Novel Obese Cricothyrotomy Task Trainer

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administer the clinical science subject exams to assist clerkship directors in determining grading standards for their students. In 2013, the NBME introduced the Emergency Medicine (EM) Advanced Clinical Examination (ACE) as an end-of-clerkship assessment for fourth-year medical students. The EM ACE was developed by an NBME task force of EM medical student educators. The exam was designed to assess the knowledge of medical students following a required 4th year EM clerkship.

Objectives: Our objective was to conduct a webcast standard setting study to develop grading guidelines that would assist clerkship directors in analyzing performance and determining passing and honors standards for the EM ACE.

Methods: In 2015, 27 EM medical student educators from 26 U. S. medical schools participated as judges in one of three webinar training sessions. Judges were trained in two standard setting methods; the Modified Angoff content-based method, a criterion referenced approach utilizing a panel of subject matter experts and the Hofstee Compromise method which incorporates both a relative and an absolute standard setting model. Judges also had the opportunity to discuss borderline examinee performance and practice item ratings. Judges independently reviewed the exam content and rated the difficulty of each item on one form of the EM ACE. Results were summarized and integrated across the two procedures and recommended standards reported on the subject exam score scale.

Results: The recommended minimum passing score using the Modified Angoff method is 57. This score fell within the range of minimum passing scores (53 - 62) when using the Hofstee method. This suggests that any passing score selected within this range is acceptable. The recommended minimum passing score when using the Hofstee method is 59. The recommended acceptable minimum scores for honors based on the Hofstee method fell between a score of 74 and 91.

Conclusions: Proposed passing and honors standards based on an item-by-item analysis of the exam content, as well as a global analysis of the content by EM medical student educators should provide helpful grading guidelines to assist clerkship directors in setting fair and valid standards for the EM ACE.

Table 1. Demographics of Emergency Medicine Expert Judges and Participating Medical Schools.

Number of Judges	Years of Experience	Number of Schools	Use CDEM National Curriculum	Pre-clinical School Curriculum		School Clerkship Length
				Traditional	Integrated	
27	1 – 20	26	93%	22%	56%	2 - 4 weeks

Table 2. EM ACE Grading Guidelines for Passing and Honors Standards (Mean Scaled Scores).

Modified Angoff	Hofstee Compromise Procedure		
Recommended Passing Score	Recommended Passing Score	Range of Acceptable Minimum Passing Scores	Range of Acceptable Minimum Honors Scores
57	53 to 62	59	74 to 91

16 Development of a Novel Obese Cricothyrotomy Task Trainer

Hwang J, Crichlow A, Parsons J, Ponnuru S, Goswami V, Hamilton R, Vozenilek J, Griswold S/Drexel University College of Medicine, Philadelphia, PA

Background: Cricothyrotomy is a rare but emergent procedure. Consequently many task trainers have been developed. However, many represent patients with normal body mass indexes (BMIs). In 2011-2012 the percentage of the US population who were considered overweight or obese was 68.5% (34.9% obese).

Objectives: Due to these statistics and a request from Emergency Medicine (EM) faculty members for cricothyrotomy training, we developed an obese patient cricothyrotomy model. It was integrated into a cricothyrotomy training faculty session and we surveyed participants' views about it.

Methods: IRB exempt status was obtained. We used a 3-D printed base model developed by Jump Simulation. A pig trachea was attached to the 3-D base. A 1.5 cm thick synthetic layer of subcutaneous tissue was placed over the trachea. The synthetic layer of subcutaneous tissue was obtained from the subcutaneous layer of the abdominal tissue set from the TraumaMan Surgical Simulator®. A layer of synthetic skin was placed over the subcutaneous layer. 3 different skin layers were trialed: skin from the Simulab® Catastrophic Event Team Training Package, from the TraumaMan Surgical Simulator®, and a combined skin-subcutaneous tissue set using ballistics gel developed by Jump Simulation. A balloon was placed at the distal end of the pig trachea to simulate lung expansion. EM faculty members from an urban, resource limited hospital volunteered to participate. They performed 2 traditional surgical and 2 needle cricothyrotomies using the Melker® cricothyrotomy kit. Pre and post survey data was collected.

Results: 20 participated in the session. The majority (14 (70%)) performed a cricothyrotomy at least once in their clinical practice. 83% of respondents stated that model was "very realistic". The criticisms focused on using it to practice needle cricothyrotomy due to the needle becoming clogged with ballistics gel and difficultly interpreting the location of the needle due to aspiration of air from potential spaces between the layers of the trainer.

Conclusions: We developed a hybrid obese cricothyrotomy task trainer. This is a unique and valuable task trainer as the need to be facile with this procedure in this population is paramount. In future iterations, modification of the thickness of the subcutaneous layer can vary the difficulty of the task trainer highlighting its potential for health professional education.

17 Do Attending EPs Change Their Head CT Ordering Practices After Reviewing Their Head CT Utilization Data?

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Background: CMS proposed OP-15 as an efficiency measure of whether head CT (HCT) scans ordered in the ED were indicated . We instituted a modified OP-15 as a quality assurance (QA) effort.

Objectives: Did HCT ordering decrease after Emergency Physicians (EPs) reviewed data on their imaging practice, and was any observed change correlated with a change in the rate of missed diagnosis or death?

Methods: This was an observational retrospective study conducted at a tertiary referral center comparing attending EP's rates of HCT during pre-intervention (PI) (April-Aug 2012), post-education (PE) (Dec 2013-March 2014), and post-review periods (PR) (April -Aug 2014). For each phase of the study we collected the most recent ten headache visits seen by each EP. In April 2013 we educated EP's on appropriate HCT ordering through a series of lectures, discussions and emails. Over Jan-Feb 2014 all EPs individually reviewed their HCT ordering metrics during annual performance reviews. In the summer of 2016 we queried the EMR for all patients sampled during the QA effort and reviewed all notes from ED, Primary Care, Neurology, Neurosurgery, and Radiology for the 21.5 month periods following each index ED visit to determine whether: significant intracranial conditions not known during the initial visit were later diagnosed or if death from any cause occurred. We excluded transfer patients and those with a history of ventriculoperitoneal shunt.

Results: We reviewed a total of 598 medical records and observed a head CT rate of 36% in both the PI and PE periods vs 26% in the PR period (p = 0.036). We observed a total of 12 deaths (3 in PI, 5 in PE, and 4 in PR) and 29 intracranial conditions diagnosed after the index ED visit. An attending EP reviewed each of these charts and found that only six of the subsequently diagnosed intracranial conditions may have been diagnosable at the index visit (2 in PI, 3 in PE and 1 in PR). No deaths appeared related to missed diagnoses. There were no statistically significant differences in death or missed diagnosis between periods.

Conclusions: We did not observe a difference in physician head CT ordering practices after educational intervention, but after all physicians reviewed their individual performance data we observed a decrease in head CT utilization of 10%. This was not associated with a change in rate of missed diagnosis or death.

Table 1. Outcome rates by epoch.

Epoch (number of patients)	Pre-intervention (183)	Post-education (215)	Post-review (200)
CT ordering rate percentage	36%	36%	26%
Death after ED visit (%)	3 (1.6%)	5 (2.3%)	4 (2.0%)
Missed diagnosis (%)	2 (1.1%)	3 (1.4%)	1 (<0.5%)

18 Does USMLE Step 1 & 2 Scores Predict Success On ITE and ABEM Qualifying Exam - A Review of an Emergency Medicine Residency Program from its Inception.

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Background: Over the years, Emergency Medicine has become a very competitive specialty with regards to the match process. This has lead to program directors viewing more and more applications for the same limited residency positions. Given this daunting task of reviewing hundreds of applicants in order to select only the best fit for the program, many in residency administration have used applicant's standardized scores as a screening process to choose which applicants they will interview. The belief is that if an applicant is successful on these standardized exams they should be successful on exams during their residency (Inservice Training Exam), as well as their post-graduate exams (ABEM Qualifying exam). Minimal literature has suggested only mild to moderate correlation1.

Objectives: Our goal was to see if this accepted preconceived notion was based in any truth. We attempted to do this by looking at USMLE scores, ITE scores and success on ABEM Qualifying Exam in an Emergency Medicine Residency over a 20 year span of time. The qualifying examination is a criterion-referenced examination. Therefore, anyone scoring 75 or higher passes the examination. This score was determined by ABEM by looking at the relationship between the ABEM ITE scores from the final year of residency and the ABEM Qualifying examination performance2.

Methods: We collected scores of USMLE Step1 & 2, ITE score from the PGY -3 yr and whether or not the resident successfully passed the ABEM Certification Exam on the 1st attempt from our archives of all residents who have graduated from our three year EM residency over the last 20 years. We compared the mean scores of each of the groups based on whether or not they passed the ABEM Qualifying exam, as well as whether or not they scored above a 75 on their graduating year ITE. We compared the two groups using the t-test to asses for significance