55 Validity Evidence for the Standard Letter of Evaluation in Emergency Medicine

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Objective: This study presents a systematic review of the published validity evidence of the SLOE using Messick's framework for construct validity: 1) content, 2) response process, 3) internal structure, 4) relation to other variables, 5) consequences of testing.

Abstract: The SLOE is the most important data point considered by programs when selecting applicants for interview and, subsequently, ranking for match. Given its success, other specialties have adopted a SLOE format. However, no study has examined the validity evidence for the SLOE.

This study presents a systematic review of the published validity evidence of the SLOE using Messick's framework for construct validity: content, response process, internal structure, relation to other variables, consequences of testing.

PubMed was searched for "(sloe OR slor) emergency medicine" returning 20 papers. 4 papers were excluded as they were not related to validity.

While no published literature regarding content validity for the SLOE exists, the development process of the SLOE provides evidence for content validity. 8 studies related to response process exist; 2/8 found evidence supporting response process validity. 1 study is published addressing the validity of the SLOE's internal structure; this study weakly supported internal structure validity. 3 studies examining the SLOE's relation to other variables exist. 2/3 studies found the SLOE to be positively correlated with future success, while 1/3 did not find the same positive correlation. There are 2 studies examining the consequences of the SLOE; both found that the SLOE is the most important part of the application.

Overall, we found the validity evidence for the SLOE lacking. While the SLOE has good evidence for content validity due to its creation process, there is not robust evidence for any other aspect of validity. However, the SLOE remains a valuable tool for EM programs, as head to head studies between the SLOE and the narrative letter of recommendation demonstrated the SLOE's superiority. It will be important to consider and incorporate aspects of construct validity as the specialty continues improve the SLOE. Further, other specialties should take this into consideration when creating SLOEs of their own.

Innovations Abstracts

1 A Continuous, 2-step in Situ Approach for Assessing ECG Interpretations of Senior EM Residents

Mempin M, Sheth S, Misch D, Elagandhala A / New York Presbyterian - Queens; Maimonides Medical Center; New York Presbyterian - Queens

Objective: To develop a curriculum that teaches senior EM residents to recognize life-threatening STEMIs despite the cognitive load of working in a busy and disruptive environment. Residents will be continuously assessed on each ECG with real-time feedback while maintaining patient safety.

Abstract: The rapid recognition of ST segment elevation myocardial infarctions (STEMIs) and life-threatening dysrhythmias on electrocardiograms (ECGs) is a core skill in Emergency Medicine (EM). Traditional methods of teaching ECGs does not account for the mental fatigue of a shift caused by loud noises/alarms, constant interruptions, and the stress of continuously multitasking. There exists an educational need to teach the rapid recognition of STEMIs and dysrhythmias despite the cognitive load of working in the ED.

We designed a two-step process to teach and evaluate ECG competency for our senior residents (PGY3s in a 3-year program).

Phase One: Residents took a pre-test to evaluate whether an ECG would provoke them to activate the cardiac catheterization lab, call an urgent cardiology consult, or take no immediate action. Residents were then given a study guide which included vetted #FOAMed websites, traditional reading material, and an originally created interactive web-based ECG course. After one month, residents took a timed post-test and were taught how to document ECGs for both medical and billing reasons.

Phase Two: Residents who scored above 85% on the post-test and did not miss more than one STEMI were allowed to sign ECGs for patients in the ED and designated with a special ID badge. This was a process that was previously limited to attending physicians only. The resident wrote their interpretation on the ECG, with at least 4 elements for documentation, and had it reviewed by an attending within 5 minutes. This provided an opportunity for immediate feedback regarding the accuracy of ECG interpretation while maintaining a high level of patient safety.

This method of combining didactics and self-study with clinical application and immediate feedback for reinforcement is a novel approach for assessing senior residents' abilities and to train them for attending responsibilities.

2 A Module-Based Novel Approach to Electrocardiogram Interpretation for Emergency Medicine Residents

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Objective: The objective of this study was to create an online module that teaches an accurate way of interpreting an ECG for use in medical education, that allows for pragmatic, pattern recognition of ECG abnormalities.

Abstract: Interpreting a 12 lead ECG with accuracy is an essential skill for emergency medicine residents. Traditional teaching, based on "rate, rhythm, axis", doesn't

provide necessary information for diagnosis and treatment in the ED setting. In addition to basic rhythm interpretation, physicians must be able to identify cardiac ischemia, abnormal rhythm and subtle ECG findings that could herald sudden death. Pattern recognition is difficult to teach, and standard textbook methods aren't sufficient. The purpose of the study was to design an online module that teaches an accurate way of interpreting an ECG for use in medical education, that allows for pragmatic, pattern recognition of ECG abnormalities.This is a before and after study design to test the efficacy of an online ECG module that was developed. A module was chosen due to its accessibility and efficiency, conducive to the EM learner. The module is self-paced and can be completed in one hour. The module teaches a novel way of ECG interpretation through the following steps: Is it sinus? Is it wide? Is there ischemia? Does this herald sudden death? The module reviews electrical abnormalities while teaching the novel approach, which helps learners synthesize information gathered from the ECG into a meaningful interpretation. Incorporated knowledge checks utilize different learning styles and allow learners to evaluate their progress. Pre module and post module ECG interpretation tests, which included a variety of ECGs, were used to determine the efficacy of the module. The gold standard was interpretation of the ECGs by an electrophysiologist. A group of EM residents had one week to complete the module between pre and post tests. There was a 21.8% increase in the median percent correct after the module ($t= 5.48$, $p < 0.0001$). Subjective data demonstrated that after the module residents utilized the novel approach, were more confident in interpreting ECGs and would use it as a resource in the future.

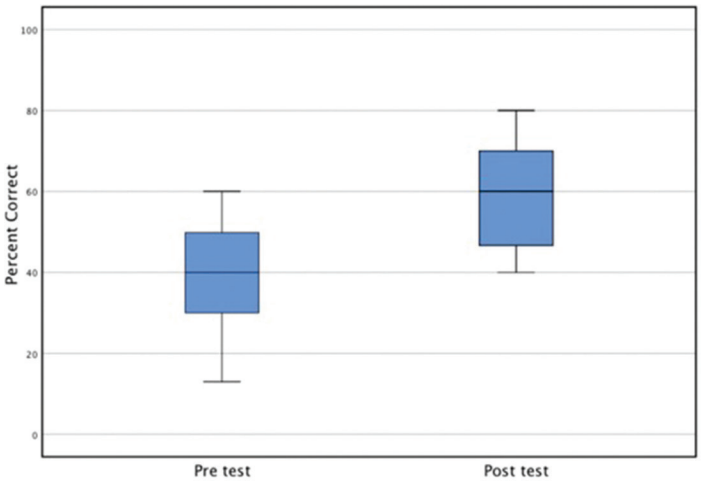

Figure 1. Boxplot showing median percent on the pre test completed before the module and on the post test after completing the module.

3 A Novel 3D Printed Task Trainer for Peritonsillar Abscess Drainage

Billet M, Williams D / University of Maryland School of Medicine

Introduction: Peritonsillar abscess (PTA) drainage is an important skill in EM. Although the procedure is not technically difficult, it can be intimidating. To our knowledge, no commercially available PTA task trainer exists. Improvised trainers exist, but have various drawbacks such as lack of fidelity, technical difficulty in assembly, and requiring parts be sourced from pre-existing trainers. We describe a trainer built using cheap, commercially available materials, and easily shareable and reproducible 3D printed components.

Educational Objectives: Increase resident comfort and familiarity with PTA drainage. Learners will be able to successfully perform needle drainage of a peritonsillar abscess.

Curricular Design: A 3D printed cartridge containing a gel-filled balloon (approximating a PTA) was inserted into a frame mimicking the oropharynx. This frame was embedded into a head made from a latex mask filled with expanding foam. This trainer was used during a workshop as part of the University of Maryland EM procedure curriculum. Residents completed an optional post-session survey to gauge attitudes regarding perceived usefulness of the session, comfort performing PTA drainage before and after the session, and realism of the trainer on a 5-point Likert scale. This survey and subsequent analysis were exempt from full IRB review.

Impact/Effectiveness: 30 residents participated in the session and completed a survey. 28 residents (93%) agreed or strongly agreed that the session was useful (mean score 4.5, 95%CI 4.1-4.9). Comfort in draining a PTA significantly increased after the session (mean pre-session score 2.0, 95%CI 1.5-2.5; mean post-session score 3.9, 95%CI 3.4-4.3). This improvement was seen across all PGY levels. There was no significant difference in perceived realism between residents who had and had not drained a real PTA (mean realism score 3.7, 95%CI 3.2-4.2). The total cost of the task trainer was $38.

In summary, this trainer represents a low-cost, easily reproduced method to improve resident comfort with PTA drainage.

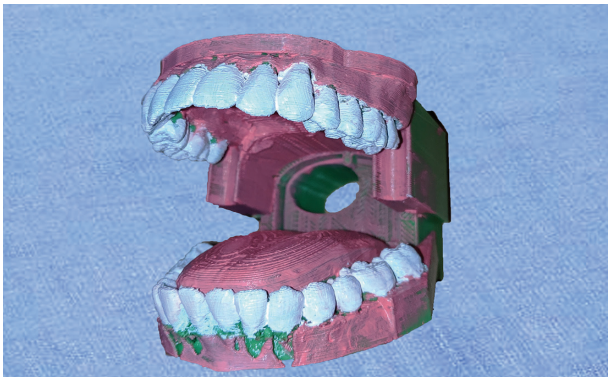

Image 1.