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Validation of a Performance Checklist for Ultrasound Guided Internal Jugular Central Lines for Use in Procedural Instruction and Assessment

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(2008 American College of Emergency Physicians EUS Guidelines), or refining and improving EUS skill for mini-fellows (MF) with significant prior experience. The MF begin with asynchronous training by completing an online US curriculum and reading a concise EUS textbook. They are then given hands-on instruction on core EUS exams and critiqued on their current EUS skills, then assigned dedicated scanning shifts with a requirement to perform over 175 EUS exams. Weekly clinical shifts are focused on increasing integration of EUS into clinical practice. 100% of the EUS exams are reviewed during weekly image review sessions to provide scored feedback and additional teaching. MF are assessed pre- and post-mini-fellowship through a survey, knowledge exam, and objective structured clinical examination (OSCE).

Impact/Effectiveness: EUS-trained EM faculty who are facile with EUS should enhance EUS education for EM residents. Preliminary data (n=2) is encouraging, and suggests that many of the educational objectives of the EUS mini-fellowship will be met.

Figure 1: Emergency Ultrasound (EUS) Mini-Fellowship Four-week Curriculum

1. Pre-mini-fellowship Survey
2. Pre-mini-fellowship objective structured clinical examination (OSCE)
3. Pre-mini-fellowship EUS Exam (<http://www.emsono.com/acep/exam.html>)
4. Read EUS Text – *Manual of Emergency and Critical Care* by Vicki Noble and Bret Nelson
5. Complete Online EUS Modules (<http://www.emsono.com>)
 - a. Practical Scanning
 - b. Extended Focused Assessment with Sonography in Trauma (EFAST)
 - c. Vascular
 - d. Aorta
 - e. 1st Trimester Obstetrics (OB)
 - f. Gallbladder
 - g. Soft Tissue
 - h. Renal
 - i. Deep vein thrombosis (DVT)
 - j. Ocular and Tendon
 - k. Focused Echo
6. Hands on session with US fellowship trained faculty, covering the following EUS examinations:
 - a. Trauma
 - b. Intrauterine Pregnancy
 - c. Abdominal aortic aneurysm (AAA)
 - d. Cardiac
 - e. Biliary
 - f. Urinary Tract
 - g. DVT
 - h. Soft-tissue/musculoskeletal
 - i. Thoracic
 - j. Ocular
 - k. Procedural Guidance
7. Complete 12 scanning shifts
8. Complete 4 clinical integration shifts
9. Participate in weekly image review quality assurance sessions and monthly journal club
10. Perform at least 175 proctored ultrasound examinations
11. Post-mini-fellowship EUS Exam (<http://www.emsono.com/acep/exam.html>)
12. Post-mini-fellowship OSCE
13. Post-mini-fellowship Survey

Figure 1. Emergency ultrasound (EUS) mini-fellowship four-week curriculum.

78 Use of Online Notetaking/Archive Service to Improve Resident Off-Service Rotations

Pelkian A, Bausano B, Sampson C / University of Missouri-Columbia, Columbia, MO

Introduction/Background: Off service rotations serve to give residents vital exposure to other specialties. Ideally, would be a guide to provide resident with all necessary information to function near the level of on service resident. Software can be used to enable the exchange of this information, allowing them to utilize more of limited rotation time gaining valuable knowledge and skills.

Educational objectives: Create a digital space for sharing information that is readily accessible to make a fast transition to the new service, allowing them to make the most of their rotation.

Curricular design: Innovation started by first year emergency medicine (EM) residents in inaugural year of new program. Residents used first hand experience to create a rotation guide using Evernote, software program designed for note taking and archiving, with the information readily accessible in a centralized location. It is dynamic in that a “note” can include a multitude of medium (word document, a webpage, journal article, audio files, and photos). This provides an advantage over using a linear method, such as forwarded e-mails, as it does not depend on a successive chain where a broken link would adversely affect oncoming resident. Initial document was created by the first EM resident and had advantage over traditional course guides in that it was from an off-service perspective offering relevant insight for the next oncoming rotator. These “insights” were critical to the success of any resident working on the service but would not likely be included in the standard “course expectations” including logistics such as a typical daily schedule, dress code, attending preferences, charting specifics to that rotation, or where to access vital electronic medical record information not typically used by off-service resident.

Impact/effectiveness: Resident perception has been positive with a “smoother transition” on rotations. Unexpected positive outcome has been that new residents have been able to perform more procedures.

79 Validation of a Performance Checklist for Ultrasound Guided Internal Jugular Central Lines for Use in Procedural Instruction and Assessment

Hartman N, Wittler M, Hiestand B, Manthey D, Askew K / Wake Forest University School of Medicine, Winston-Salem, NC

Background: We have created and validated a checklist for performance of ultrasound guided internal jugular central venous catheter (US IJ CVC) placement using the modified Delphi method. We now seek to validate it for use in an educational environment in order to evaluate competency in procedure performance.

Objectives: To evaluate a checklist tool for assessment of resident skill in US IJ CVC placement. We hypothesize that

a checklist score ascertained for resident performance of this skill will highly correlate with a validated global rating scale (GRS) for procedural performance.

Methods: An Institutional Review Board approved, randomized, prospective study was completed involving procedural skill evaluation and feedback on resident performance of US IJ CVC in a simulated environment, including 15 postgraduate year-1 (PGY-1) emergency medicine residents at an academic medical center in July-August 2014. During the study, each resident performed US IJ CVC placement twice, with two faculty instructors evaluating procedural skill and providing feedback. Each faculty team completed a summated performance checklist and each faculty member completed a GRS for each procedure performed. These measurements were compared to one another.

Results: Each resident performed 2 US IJ CVC placements, for 30 total procedures. The correlation between the GRS scores and the checklist scores was excellent, with a correlation coefficient (Pearson's r) of 0.90 ($p < 0.0001$) for the first placement, and 0.89 ($p < 0.0001$) for the second placement. Further, the inter-rater reliability for the GRS was also excellent, with kappa of 0.79 (95% CI:[0.75-0.84]). A previous study using this instrument showed a kappa of 0.77, suggesting consistent inter-rater reliability.

Conclusions: The checklist scores for resident performance were highly correlated with a validated global rating scale, which itself demonstrated excellent inter-rater reliability. This checklist represents a useful tool for measuring procedural competency.

80 Videotape Augmented Feedback for Procedural Performance

Wittler M, Askew K, Hartman N, Manthey D / Wake Forest Baptist Medical Center, Winston-Salem, NC

Background: Resident programs must teach and assess residents' achievement of core competencies for practice-based improvement as well as procedural skills. Physicians' ability to recognize their own strengths and limitations are limited. Videotape augmented feedback may facilitate procedural skill acquisition and promote more accurate resident self-assessment.

Objectives: Primary aim: investigate whether videotape-augmented verbal feedback leads to increased procedural skill compared to verbal only feedback. Secondary aim: determine if videotape-augmented verbal feedback improves the accuracy of self-assessment compared to verbal only feedback.

Design: Institutional review board approved single center, prospective, randomized, controlled study of an educational feedback method. Setting: Procedural training on ultrasound guided internal jugular central venous catheter (US IJ CVC) placement using task trainer.

Participants: Fifteen emergency medicine interns.

Interventions: Participants were randomized to videotape-augmented or verbal only feedback. All participants received feedback based on a validated 30 point checklist for US IJ CVC placement. A validated 6 point procedural global rating scale documented overall perception of resident's procedural competency.

Results: Both groups improved by a mean increase of 9.6 points (95% CI:[7.8-11.4]) on a 30 point scale. There was no difference in mean score improvement based on addition of video in either the procedural checklist or the global rating scale. The self-assessment of the participants deviated from faculty scoring, increasingly so after receiving feedback. Residents rated highly by faculty underestimated their skill, while those rated more poorly demonstrated increasing overestimation. Accuracy of self-assessment was not improved by addition of video.

Conclusions: Feedback advanced the skill of the resident, but video did not add to verbal feedback alone. Feedback does not improve the inaccuracy of resident self-assessment.

81 Visual Diagnosis: Harnessing Social Media for the Purpose of Medical Education

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Introduction/Background: Images have been a cornerstone of medical education, to substitute and supplement variable clinical experience. Certification examinations across medical specialties, including emergency medicine (EM), utilize visual stimuli for testing purposes. Historically, most medical images have been located in written publications that are often outdated or inaccessible, with a relatively limited number of images. The rise of social media and creation of photo-sharing applications for medical professionals have allowed for instant, global, and low-cost access to a wealth of images.

Educational Objective: We sought to increase EM resident and faculty exposure to and awareness of clinically relevant and important images, by using images from the "Figure 1" medical image database (figure1.com) to lead case-based discussions.

Curricular Design: Using a modified Delphi technique with two EM faculty, 10 EM-relevant medical images were selected from the Figure 1 image database each month. During weekly educational conferences, images were introduced, via clinical vignette, to EM residents and faculty. Residents discussed the diagnosis and treatment of each presented case, which was followed by prepared faculty comments.

Impact/Effectiveness: Ongoing evaluations by residents and faculty of this visual diagnosis case series are overwhelmingly positive, identifying it to be innovative and interesting. Many specifically commented on their intent to begin using this application to contribute to the global image database and continue their discussion online.