Council of Emergency Medicine Residency Directors Advances in Education Research and Innovations

The Council of Emergency Medicine Residency Directors Advances in Education Research and Innovations Forum presented a peer-reviewed selection of emergency medicine graduate and undergraduate educational research and innovations in both oral and poster formats at CORD Academic Assembly 2015. Emphasis was placed on novel research questions and designs. Innovation submissions included curricular designs, computer applications, faculty development, recruitment processes or similar topics.

The *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health* would like to thank the Council of Emergency Medicine Residency Board of Directors for helping to make this collaborative special issue possible.

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1 "Acting" Interns, Assessing When Senior Medical Students Call for Help Using Standardized Patients

Wald D, Peet A, Yu D / Temple University School of Medicine, Philadelphia, PA

Background: Previously we reported that senior medical students (SMS) frequently call a senior resident (SR) for help when encountering simulated cases.

Objectives: Using standardized patients (SP), we assessed how often and why SMS call a SR for help.

Methods: We developed 3 cases: chest pain (CP), sepsis (SEP) and altered mental status (AMS). The SMS were instructed to function as interns; they each evaluated one case and were told a SR was available for consultation. A post-course survey was used to assess how often and why the SR was called, differences between cases were evaluated using Chi-square analysis.

Results: 134 students completed the survey. Most agreed the cases were realistic: CP (93.5%, n=46), SEP (93.8%, n=48), AMS (92.5%, n=40). The SR was called by 49 (36.6%) SMS. The SR was consulted more often with the SEP case than the other cases (50% vs. 27.5% AMS, 30.4% CP; p=0.05). Reasons for calling were: reassurance (66.7%), assistance with therapeutic management (35.4%), assistance with diagnostic work-up (16.7%) and not sure I was providing the proper care (16.7%). All SMS felt they called at an appropriate time. SMS called more often for reassurance with the CP (71.4%) and SEP case (82.6%) than the AMS case (27.5%) ($p<0.05$). In the AMS case, SMS called more often because they were unsure what was wrong (36.4%) vs. 0% in the CP and SEP cases ($p<0.05$). 16.7% called because they were not sure they were providing proper care. In 68.8% of cases, the SR changed the care being provided; no difference noted between the 3 cases. 45.2% who did not call reported they would call if presented with the same case again. 18% (n=128) reported having concerns calling a SR. Not wanting to bother or annoy the SR was the most commonly reported.

Conclusions: SMS called a SR for variety of reasons; this may be affected by the type of case encountered. Some SMS may be hesitant to call their SR because they do not want to bother or annoy them.

2 A Comprehensive Procedural Credentialing System / Curriculum for High Risk Procedures

Ahmed R, Atkinson S, Hughes P, Cepeda J, Southern A, Jwayyed S / Summa Akron City Hospital, Akron, OH

Background: How to effectively train and credential residents to perform high-risk procedures has remained elusive. We present a detailed description for the development and implementation of a simulation based procedural credentialing curriculum at a large academic institution. This three-step process provides training, graduated responsibility and credentialing that utilizes a badge system for 11 invasive procedures.

Educational Objectives: 1. Identify key elements necessary for the development of a simulation-based, patient safety procedure credentialing policy. 2. Illustrate a step-wise certification program that utilizes badge identification for graduated procedural competency.

Curricular Design:

Step 1: Didactic Requirement

a. Review the instructional videos, formal written didactic materials and post-test.

Step 2: Simulation Lab Requirement

a. Review the competency checklist for each procedure. An overall score of 80% on the checklist is necessary for passing.
b. After successful completion of Step 2 the trainee Procedure Card will be punched indicating permission to perform the individual procedure under the direct supervision of a credentialed physician.

Step 3: Bedside Procedure Training Requirement

a. The trainee will be provided with a Procedures Log Form to logging procedures under direct supervision with the goal of completing the pre-determined number of procedures, leading them to the completion of Step 3 (full credentialing for the individual procedure).

Impact/Effectiveness: We have effectively trained and credentialed 200 residents across multiple residencies using this system. Further, our data demonstrates that interns show improved confidence across all surveyed skills (3.2 vs. 4.0) after Step 2. We believe this procedure credentialing curriculum is generalizable to other institutions and would be useful to educators in emergency medicine. This credentialing process standardized the curriculum for residency programs at a major academic center.

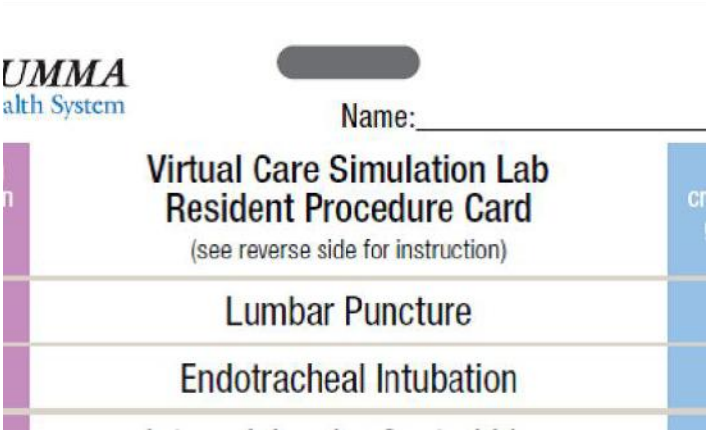

Figure 1.

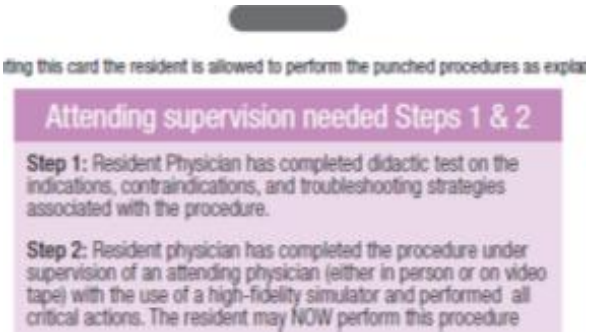

Figure 2.

3 A Dedicated EBM Curriculum Integrated into Journal Club Increases and Sustains EBM Competency: An Innovation in EBM Curriculum

Kluesner N / University of Iowa Hospitals and Clinics, Iowa City, IA

Introduction: With the increasing volume of clinical evidence available to practitioners, curricula designed to teach residents the principles of evidence-based medicine (EBM) and knowledge translation have become a significant focus throughout graduate medical education. The method to best deliver these needed skills has been an area of active research and innovation.

Educational Objectives: The goal was to develop a dedicated EBM curriculum implemented as part of a monthly journal club on EBM competency. We hypothesized that integrating EBM principles into a novel and revised journal club format would increase EBM competency, and that these educational gains could be sustained.

Curricular Design: A formal EBM curriculum was implemented utilizing a four-pronged approach: 1) peer instruction model and peer to peer discussion coordinated by a teaching resident, 2) dedicated EBM lecture delivered at the beginning of each journal club, 3) identification of teaching residents who select articles consistent with EBM topic focus, and 4) core EBM faculty to deliver lectures and meet with teaching residents. An 18 month curriculum was adopted with this approach in June, 2012. The Fresno test, a validated instrument for assessing EBM competency, was administered to all residents annually, starting the year before implementation.

Effectiveness: A total of 22 respondents encompassed the pretest group, with 23 respondents in the year 1 post-test and 26 respondents in the year 2 post-test. A multivariable model using generalized estimating equations controlling for year of residency and repeated measures demonstrated a significant increase in performance from the pre-test data to the subsequent two post-test years (pre-test adjusted mean 110.16, year 1 adjusted mean: 127.82, year 2 adjusted mean 127.07, p=0.011). An EBM curriculum implemented as a part of journal club was an effective strategy for increasing competency, and improvements were sustained after implementation.

4 A High-Fidelity Porcine Model for Teaching Transvenous Pacing to Emergency Medicine Residents

Frawley T, Walsh R, Bothwell J / Madigan Army Medical Center, Tacoma, WA

Introduction: The Accreditation Council for Graduate Medical Education (ACGME) considers cardiac pacing a "key index procedure" for Emergency Medicine (EM) residents, requiring 6 pacing procedures during training. Because it is considered a "rare" procedure, the ACGME allows all 6 to be performed in the lab. Transvenous pacing (TVP), a subset of cardiac pacing, is technically challenging and requires training to develop competence. Many modalities have been described (bedside instruction, mannequins and instructional videos) but they are relatively low fidelity. To our knowledge, there are no commercially-available simulators for TVP training.

Educational Objective: We sought to use swine as a high-fidelity, anatomically and physiologically realistic training model for teaching TVP.

Curricular Design: We found anecdotally that swine make excellent models for teaching TVP. Once the internal jugular vein is cannulated, TVP can be performed in practically the usual manner. The internal jugular (IJ) catheter is placed under ultrasound guidance and remains secured in place between iterations. Thereafter, the process of inserting and advancing the pacer, and adjusting the rate and output are the same as in humans, and can be done multiple times on a single model. We monitor for pacer capture using a pulse oximeter, although cardiac monitoring may also be possible. Alternatively, direct visualization can be used if thoracotomy training is performed prior to TVP. To our knowledge, this is the first description of the porcine model to teach TVP to EM residents.

Impact/Effectiveness: The model allows multiple learners to perform multiple training iterations on the same day, of a procedure that is life-saving but infrequently encountered. We feel that this repetition allows learners to develop muscle memory and to solidify equipment familiarization. Finally, our porcine model provides residency programs another avenue for achieving ACGME requirements for this key index procedure.

5 A Low Cost Yet Realistic Tube Thoracostomy Model for Emergency Medicine Resident Training

Lewis N, Vitto M / Virginia Commonwealth University, Richmond, VA

Background: Emergent tube thoracostomy is a critical lifesaving procedure performed in the emergency department. Emergency medicine residents must be confident and experienced

in this procedure prior to graduation. Previous models including live animal labs and computerized manikins are expensive and can be difficult to run. We developed a low cost, easy-to-construct model using supplies readily available in the emergency department and pork spare ribs purchased from a grocery store.

Educational Objectives: The objectives of this model are 1) to provide emergency medicine residents with a life-like task trainer for hands-on practice in tube thoracostomy insertion, and 2) to provide an inexpensive alternative to high fidelity simulators while remaining reusable and easy to set up.

Curricular Design: Our model was created in order to provide residents with additional practice in tube thoracostomy insertion above that which they gain on actual patients. The model was created using a side of pork spare ribs wrapped in an absorbable chux pad and supported on its side by towel rolls. The outside of the model was then covered with a thin foam sheet from an arts and crafts store and secured with tape (Figure 1). After construction, we used the model along with a standard chest tube insertion kit in small group sessions. This allowed each resident to independently perform the procedure (Figure 2) and provided an opportunity to discuss basic chest tube management in a low stress environment.

Impact: Residents were not formally assessed, however they universally expressed benefit from the added procedural instruction. Further, the model allowed for realistic simulation of the entire procedure from the injection of anesthesia to the "pop" felt when entering the chest due to the intact fascia along the back of the ribs. In conclusion, our tube thoracostomy model presents a low cost yet realistic alternative to high fidelity simulation for tube thoracostomy instruction.

Figure 1.

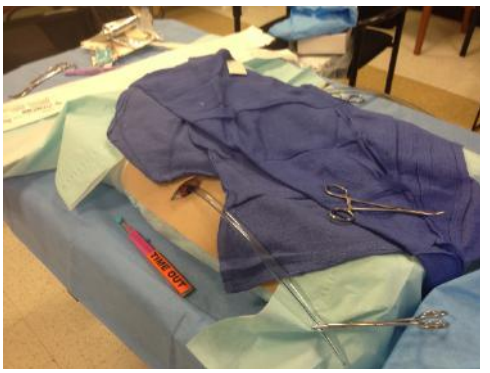

Figure 2.

6 A Prospective Analysis of Milestone Integration into Resident Global Assessment

Lefebvre C, Hartman N, Hosmer K, Glass C, Hiestand B / Wake Forest School of Medicine, Winston Salem, NC

Background: End-of-shift (EoS) evaluations including questions regarding milestone achievement are commonly used by Emergency Medicine (EM) training programs. There is little objective evidence regarding the integration of milestone achievement into existing evaluation strategies. This prospective observational study compared faculty assessments of resident global performance to assessment by a clinical competency committee (CCC) using EoS milestone data.

Methods: Surveys were distributed to faculty members, asking for a global performance score (1-6) for each resident. The score assigned to the resident was the average of the faculty responses. Milestone data was collected by an EoS evaluation tool, already in use at the institution, from January-June 2014. Free-text comments were also collected during these EoS encounters. The CCC, blinded to resident identity, assigned a performance score (1-6) to each resident based solely on EoS milestone scores. Scoring was repeated after including free-text comments to the milestone scores. Correlation between scores was assessed by Spearman's rho.

Results: 31/42 faculty participated in the survey. 43 EM residents were evaluated by the faculty and CCC. Mean performance scores: milestone-only data (MO)=3.76 (range 2-5), milestone plus free text comments (MFT)=4.2 (range 3-6), survey based faculty assessment (FA)=4.38 (range 3.5-5.4). Spearman's rho for FA and MO scores was -0.11, demonstrating no significant correlation (p=0.49), while rho for FA and MFT scores was 0.4173 (p=0.007), indicating significant correlation.

Conclusions: Subjective information in the form of faculty comments at the EoS may describe performance elements not adequately measured by milestone assessments. There was stronger correlation between the CCC and faculty scores when milestone data was combined with the subjective observations of supervising faculty. Other tools for resident assessment are necessary to supplement milestone achievement scores.

7 A Simulation Based Approach to Disaster and Triage Training

Masters M, Crosby J, Thompson R, Lohmeier M / University of Wisconsin Hospital and Clinics, Madison, WI

Background: There is a dearth of residency training in disaster medicine and techniques involved in triaging mass-casualty incidents (MCIs). Furthermore, due to variability and infrequency of MCIs, residents lack experiential practice.

Educational Objective: To create a simulation experience that improves practitioner confidence and skill

managing patients during a MCI.

Curricular Design: A group of faculty and residents designed a multi-station disaster simulation scenario involving attendings, residents, nurses, and medical students. The aim was to provide participants with a realistic learning environment, enhance proficiency with clinical skills and triage models, and increase comfort managing complex, dangerous situations. Teams of 5-6 were introduced to a multi-victim scene using live actors in moulage and low-fidelity manikins. They triaged patients with colored tags, assigning treatment and modes of transport using hypothetical resources from a defined, limited supply. A subsequent scenario involved a scene patient, a high-fidelity SIM manikin. Other stations included the use of personal protective equipment (PPE) and performing clinical skills wearing PPE. Group debriefing followed, with a lecture on the different triage models (START, SALT, and JumpSTART).

Effectiveness: We measured the training's efficacy using pre- and post-scenario surveys designed to assess the individual's knowledge base and comfort with MCIs. Questions included "do you have an understanding of models for triage in a MCI?", "are you comfortable triaging multiple patients?", and "are you comfortable leading a team of providers?" 75% of respondents were residents; all reported an increase in comfort and understanding across the criteria surveyed. Furthermore, all respondents agreed (33%) or strongly agreed (67%) that a disaster and triage simulation is a useful training tool. The plan is to repeat a similar scenario in 18 months, with a follow-up survey.

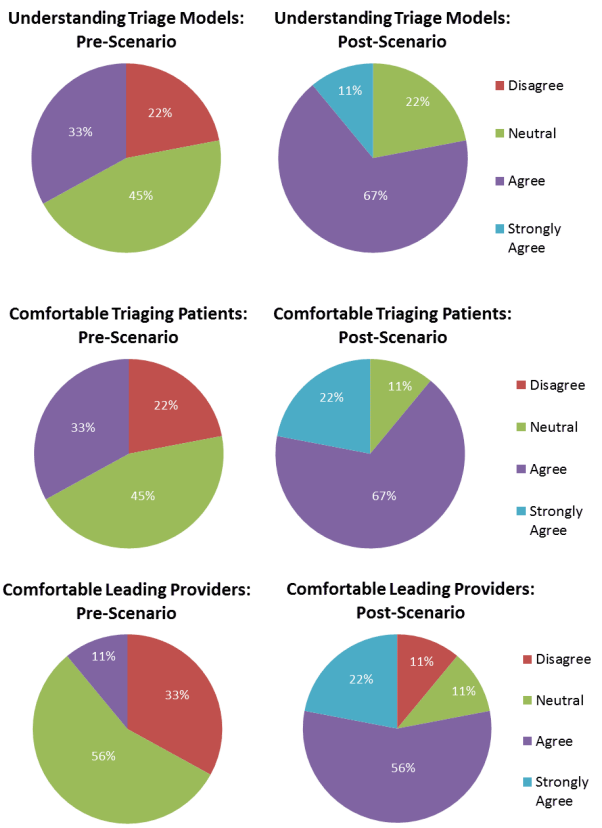

Figure 1.

Figure 2.

8 ACGME Milestone Achievement through Simulation: Development of an Extensor Tendon Repair Simulation Model

Aronstam E, Overton D / Western Michigan University School of Medicine, Kalamazoo, MI

Introduction: Tendon repair is an Accreditation Council for Graduate Medical Education (ACGME) Emergency Medicine Milestone (Milestone 13, Wound Management, Level 5 - "Performs advanced wound repairs, such as tendon repairs"). However, emergency medicine (EM) residents may have limited opportunity to develop these skills. Previously described tendon repair simulation models, designed for surgical trainees, have used models such as rubber worms, sheep forelimbs and cadavers. We developed a simple and inexpensive extensor tendon repair simulation model for emergency medicine residents, designed to satisfy Level 5 of Milestone 13.

Educational Objectives: Development of a simulation module to teach EM residents: 1) the relevant anatomy of the extensor tendons of the hand; 2) the indications and contraindications for emergency department (ED) tendon repair and 3) the techniques of tendon repair.

Curricular Design: During the post graduate year-2, EM residents are provided an on-line module containing the: 1) relevant anatomy; 2) indications and contraindications; 3) relevant PE findings; 4) suture techniques; 5) aftercare and 6) a post-test.

Each month, 2-3 residents receive this module prior to their scheduled session. The module is to be completed ahead of time.

During each session, each resident is supplied two pig feet. They dissect out extensor tendons and perform tendon

repairs using 4 stitches: modified Kessler, modified Bunnell, figure-of-eight and horizontal mattress. The lab takes an hour and requires the presence of a single faculty member.

Impact: 16 residents have completed the module so far. A post-lab survey was given with an 81% response rate. 92% of respondents agreed or strongly agreed that the training was useful and 85% felt more confident in performing extensor tendon repairs.

This educational innovation meets our objectives. Pig feet are readily available and inexpensive. The module is on-line, self-taught and faculty time expenditure is low. Post-test results have revealed good mastery of the content and resident feedback has been positive.

9 All NYC EM: A Regional Education Conference Enhancing Emergency Medicine Education

Egan D, Husain A, Jones M, Kass D, Morley E, Nguyen T, Silverberg M, Swaminathan A, Shah K / NYU School of Medicine, New York, NY; Staten Island University Hospital, New York, NY; Albert Einstein School of Medicine/Jacobi Medical Center, New York, NY; Stony Brook University School of Medicine, Stony Brook, NY; Mount Sinai Beth Israel, New York, NY; SUNY Downstate Kings County Hospital, New York, NY; Icahn School of Medicine at Mount Sinai, New York, NY

Introduction/Background: Emergency medicine (EM) residencies strive to improve the education of their residents through innovative didactic programs. The NYC area contains multiple EM residencies and as a result, numerous educators are concentrated in this region. In addition, highly desirable grand rounds speakers may limit repetitive travel to any single region, thereby preventing multiple residency exposures to them.

Educational Objectives: We sought to create a sustainable and innovative region-wide EM educational program for all learners in the NYC metropolitan area. A steering committee representing multiple residency programs was formed to design curriculum and to plan educational events. The "All NYC Emergency Medicine Conference, Inc" [All NYC EM] was registered as a 501(c) (3) non-profit entity with steering committee members serving on its inaugural board.

Curricular Design: All NYC EM hosts spring and fall conferences each year featuring local educators and prominent guest speakers from around the nation. Conferences are themed and have evolved to include multiple short lectures, panel discussions and resident lecture competitions. All NYC EM has also launched an EM Education fellowship (offering funding to Council of Emergency Medicine Residency Directors and iTEACH), an annual chief resident forum and a medical student residency application boot camp.

Impact/Effectiveness: Since its inception, All NYC EM has hosted 7 conferences, 2 chief forums, 1 medical student boot camp and supported 2 fellows. Attendance at the regional conference continues to grow. 533 residents, students and faculty representing 18 EM residencies attended "All NYC 7" in April of 2014. Feedback has been overwhelmingly positive, with a satisfaction score of 4.1 on a 1-5 Likert scale in regards to education content and usefulness in April, 2014. Likewise the chief forum and medical student residency application boot camp have received praise for their contributions beyond traditional student/resident resources.

10 An Innovative Approach to Emergency Medicine Stroke Education Utilizing Simulation and E-Learning Improves Time to Diagnosis and Treatment: A Pilot Simulation Program

Frallicciardi A, Nowicki T, Abbott L / Hartford Hospital/ University of Connecticut, Hartford, CT

Introduction/Background: Time is brain. It is of utmost importance to recognize and treat stroke immediately in the emergency department (ED), but residents begin their clinical duties with little practical education on how to approach this complex disease.

Objective: The objective of this curriculum is to teach emergency medicine interns how to recognize and manage acute strokes effectively and efficiently in the ED utilizing a blended curriculum of medical simulation and e-learning.

Curricular Design: Part 1 of the curriculum is completion of the American Heart AssociationÂ® National Institute of Health (NIH) Stroke Scale online module. Learners then participate in a small group stroke simulation session consisting of 6 cases of neurologic catastrophes and interactive post case debriefing. Cases are original and emphasize the time sensitivity of an accurate diagnosis and treatment plan.

Effectiveness: The effectiveness of the curriculum has been measured over 2 years (n=36). Time to Head computerized tomography (CT) and tissue plasminogen activator (t-PA) orders in the sim cases significantly improved. Initially time to CT order was 7.8 minutes into the case (SD1.8, 95% CI 1.4), which improved to 3.42 minutes(SD 2.3, 95% CI 1.8) by the end of the sessions. The residents also ordered t-PA in ischemic strokes 4.2 minutes faster (CI:[1.97,6.5]). The NIH scoring of the patients was very accurate (SD 0.06) in all cases. The self-efficacy score improvement over the course was significant at 1.6 (CI:[1.9,1.25]). On a multiple choice post-test, scores were on average 22.25 percentage points higher (95% CI:[-29.0-15]).

Teaching complex processes may require multiple educational modalities to be effective. Interns who participated in this blended learning program had improved

confidence, knowledge and efficiency in diagnoses and treatment of acute strokes. The e-learning effectively taught them the NIH scale and gave them the background required for rapid acquisition of knowledge during the simulations. Future steps include clinical performance analysis and Neurology resident participation.

11 Attending Faculty at an Emergency Medicine Residency Have Poor Agreement on Rating Residents Using the ACGME Milestones

Goldflam K, Bodd J, Della-Giustina D, Tsyrulnik A / Yale University School of Medicine, New Haven, CT

Background: In 2012, the Accreditation Council for Graduate Medical Education (ACGME) implemented 23 milestones to assess the proficiency of emergency medicine (EM) residents. The milestone and their progressive levels have been validated only in that residency leadership faculty were asked to rank the order through which the residents should progress in each category. No other validation method has been applied to date. One way to determine the validity of an evaluation tool is to examine the inter-rater reliability when the tool is applied to the same subject by different evaluators.

Objectives: Our study examined the inter-rater reliability of EM faculty members in assessing EM residents using the milestone levels.

Methods: This observational cross-sectional study was performed at an academic EM residency. Twenty faculty members evaluated 25 randomly chosen residents using eight ACGME EM milestones. These milestones were scaled on a 1-9 scale to represent the milestone levels. The specific milestones evaluated were chosen by residency leadership as those in which the average EM attending would have sufficient knowledge of the resident in order to properly evaluate them.

Individual and average Intraclass Correlation Coefficients (ICC) were calculated to determine the reliability of attending assessment.

Results: Each resident was assessed by an average of 16 attendings (min=10, max=20). Individual ICCs did not exceed a threshold of 0.72 (min=0.396, max=0.516). However, average ICCs were greater than 0.9 for each milestone examined.

Conclusions: Although agreement increases with a higher number of evaluators, there is low agreement between individual attendings evaluating the same resident on milestone levels. This means that EM faculty may require further education on the milestones or that the milestone levels require further refinement to become a valid assessment tool or both. The major limitation of this study is the small sample size of raters and residents evaluated.

Table 1. Attending evaluation intraclass coefficients by milestone.

Milestone	ICC individual	ICC average
Communication	0.39674	0.92934
Diagnosis	0.46124	0.94482
Diagnostic studies	0.48240	0.94908
Disposition	0.45488	0.94347
Emergency stabilization	0.51663	0.95531
History and physical	0.42507	0.93666
Multi-tasking	0.43501	0.93902
Team management	0.41651	0.93454

ICC, intraclass correlation coefficients

12 Basic Back: A Low Fidelity Simulation Model for Lumbar Puncture

Cabezon M, Gaeta T / New York Methodist Hospital, Brooklyn, NY

Introduction: Industrial models for lumbar punctures (LPs) are expensive and with a residency of thirty doctors, a need arose for a partial task trainer that is low fidelity, low cost, easily reproduced, re-usable and effective at simulating the procedure.

Educational Objective: To be used for teaching and assessing procedural skills in LPs; and to describe its integration into a milestone based, procedural competency education module.

Curricular Design: This is the second of multiple low fidelity simulation models that I have devised. The materials (and costs) per model are as follows: Wire Chaffing stand $2.99, three-Wooden letter O's (vertebra) $4.50, Wooden dowel $1.00, Plastic tubing $1.00, piece of Vinyl (skin) $1.00, 3"x5"x2" piece of foam $0.50. Total cost ~$10.50, as compared to a professional model which lists $510 to $2200 per model.

The educational session begins with a written self-assessment of the participant's knowledge of the indications, contraindications, anatomic considerations, equipment, procedure, complications, and aftercare. The assessment tool is a structured open-ended questionnaire. During a didactic session, participants are encouraged to take notes on their self-assessment form (in red ink). Forms are collected and a pre-printed completed procedure overview sheet is provided for the learner to keep. In the practical session learners are paired off one-to-one with an attending or credentialed senior resident who reviews again the learners understanding from indications to aftercare. Faculty has the opportunity to evaluate senior residents in the "level 5" milestone (teaches procedural competency and corrects mistakes).

Impact/Effectiveness: This process incorporates all learning styles (visual, auditory and kinesthetic) in a simple, inexpensive, and reproducible manner. Resident feedback has been excellent, stating that the anatomy / landmarks are spot-on and the interactive multifaceted learning session improved understanding of the material.

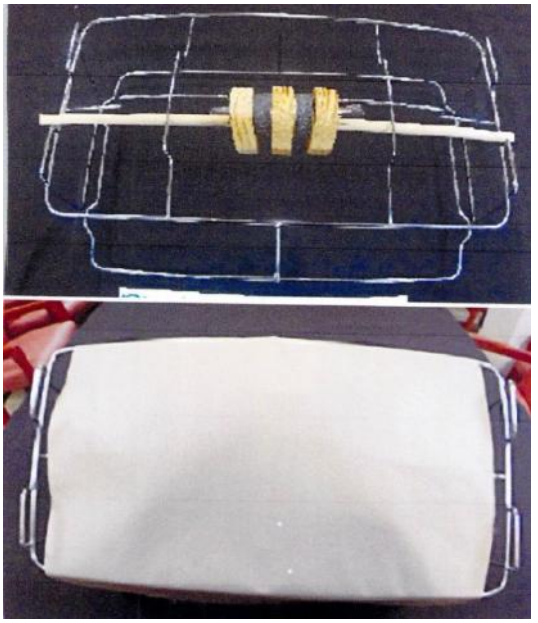

Figure 1.

13 Bridging the Gap: Implementation of a Near-Peer Resident-Medical Student Mentoring Program Within an Academic Emergency Medicine Residency Program

Caretta-Weyer H, Masters M, Tillman D, Hess J / University of Wisconsin Hospital and Clinics, Madison, WI

Background: Many medical students find navigating the residency application and match process challenging, Medical students often cite mentors and peers as having the greatest impact on this process. Thus, we sought to develop a mentoring program where current emergency medicine residents mentor rising senior medical students through the application and interview process. Given their proximity to the process, these residents function as near-peer advisors. Currently, there is no literature within emergency medicine describing such a resident-medical student mentoring program (RMSMP).

Educational Objectives: The primary educational objectives of the RMSMP are (1) to provide senior medical students intending to pursue residency in emergency medicine with mentoring through the residency application and interview process; (2) to allow residents the opportunity to gain experience mentoring medical students; (3) to improve medical student comfort with the application and interview process.

Curricular Design: The RMSMP is open to both University of Wisconsin (UW) rising 4th year students and visiting students. UW students opt-in during the spring semester of 3rd year while visiting students opt-in on their first day of the rotation. Students are then paired with a resident mentor. There is no fixed agenda for meetings; however, it is recommended that they discuss away rotations, the personal statement, CV, interviews, and rank list formation. A post-mentoring survey was deployed to assess perceived benefits and potential improvements to the program.

Impact: Students responded overwhelmingly in support of the program with 94% responding that it was a beneficial experience. The most commonly cited positive aspects of the program included obtaining specific feedback and advice on the application process, personal statement, and interviews. Suggested improvements focused on increasing face-to-face meetings. We plan to collect and publish outcome data at the 5-year mark.

14 Building a Resident Research Program

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Introduction/Background: Residency requirements state "residents participate in the development of new knowledge, learn to evaluate research findings, and develop habits of inquiry as a continuing professional responsibility". However, there is little consensus regarding how best to achieve these requirements.

Educational Objectives: Implement a Resident Research Program emphasizing resident participation in empirical work.

Curricular Design: A 3-step program "Think, Do, Write" roughly follows the 3 years of the residency. During the 1st phase the resident choses a topic, formulates a hypothesis, and completes standard research certifications. Phase 2 involves submitting an institutional review board (IRB) and conducting the study. The final phase entails analyzing and interpreting the data and writing an abstract to present during an annual research day. Residents are encouraged to submit their projects for presentation at scientific conferences and for publication. Multiple departmental resources are available, including a Resident Research Fund and full support of the faculty.

Impact/Effectiveness: Prior to the new program, most scholarly activity consisted of case reports, book chapters, review articles, or other miscellaneous projects. Starting in 2012 the new program was fully implemented. Within 1 year, there was a growth in original empirical works among residents (see Figure 1). Currently there is almost 100% participation in studies, and numerous residents have presented at national conferences and have peer-reviewed publications. There is increased enthusiasm for research, and the new program has demonstrated that emergency medicine (EM) residents can conduct high-quality projects. Implementation of similar programs across EM residencies can increase the presence of such work conducted by residents in the EM literature and scientific conferences.

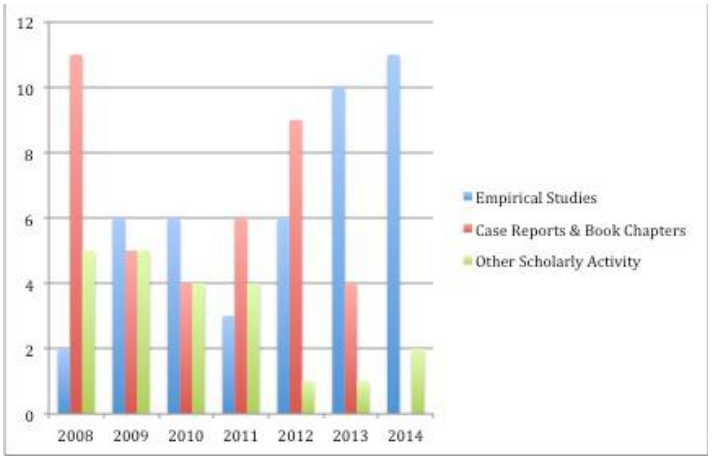

Figure 1.

15 Congratulations! You Are an MD, But Are You Ready for the ER?

Crawford S, Monks S, Solomin D, Greer V / Texas Tech University Health Science Center, El Paso, TX

Background: Emergency medicine (EM) faculty were tasked with implementing the Accreditation Council for Graduate Medical Education (ACGME) Milestones Project for the evaluation of resident physicians. All incoming residents are expected to function at Level 1 proficiency. Many of the milestones can be assessed in a simulation center, a safe environment for teaching and evaluation.

Educational Objectives: At the end of the EM orientation month, interns would be able to recognize and treat five common emergency department (ED) complaints at a minimum Level 1 proficiency. In addition, faculty would have more direction for incorporating the milestones into the existing curriculum.

Curricular Design: Five common ED complaints were each developed into five cases to be treated by groups of 2-3 interns. Headache presentations included migraine, post lumbar puncture headache, meningitis and both subarachnoid and subdural hemorrhage. Shortness of breath presentations included asthma, pulmonary embolus, congestive heart failure, pneumothorax, and pneumonia. Chest pain presentations included nonspecific chest pain, ST-elevation myocardial infarction, aortic dissection, herpes zoster, and gastroesophageal reflux disease. Abdominal pain presentations included cholecystitis, appendicitis, abdominal aortic aneurysm, pancreatitis, and small bowel obstruction. Pelvic pain/bleeding presentations included ovarian torsion, ectopic pregnancy, pyelonephritis, pelvic inflammatory disease, and fibroids. A faculty member ran each case while the remaining interns viewed and scored the assigned groups. Scoring rubrics included 15 milestones to indicate Level 1 or 2 proficiency, or failed to meet Level 1 criterion.

Impact/Effectiveness: Interns were assessed on their ability to perform a history, physical exam, initial evaluation/management, and create a differential diagnosis/plan. Twelve interns participated; one group failed a case while the majority exceeded Level 1 proficiency. Assessing milestones in Year 1 is essential for both the intern and faculty to properly gauge the needs of the class and the individual. This also allowed for a debriefing discussion of local practice and hospital guidelines.

Table 1. Milestone proficiency scoring form.

Presentation: Case:	Group participants	Proficiency level (0, level 1, level 2, or N/A)
Milestone:		
PC 1: Emergency stabilization		
PC 2: Focused H&P		
PC 3: Diagnostic studies		
PC 4: Diagnosis		
PC 5: Pharmaco-therapy		
PC 6: Observation and reassessment		
PC 7: Disposition		
PC 8: Multi-tasking		
PC 9: Procedures-anatomy and physiology		
PC 11: Anesthesia		
PC 12: Ultrasound		
PROF 1: Professional values-interest		
PROF 2: Timelines and reporting		
ICS 1: Patient communication		
ICS 2: Team management		

H&P, history and physical; *ICS*, interpersonal and communication skills

16 Do You Come Here Often? "Speed-Advising" for Medical Students Matching in Emergency Medicine

McGrath J, Way D, Kman N, Greenberger S, Bachmann D, Gorgas D, Hill M, Martin D / The Ohio State University Wexner Medical Center, Columbus, OH

Introduction/Background: The number of 4th year medical students pursuing emergency medicine (EM) residency is increasing. Group sessions provide information about the match program in EM. However, students request personal meetings with multiple EM educators to establish relationships and ask individual questions. Meetings are time consuming and logistically challenging for faculty and students.

Educational Objectives: We implemented a novel "speed-advising" session (SAS) for students pursuing EM residency.

Curricular Design: Two, 2 hour SASs were held in August. Advisees completed a pre-session form and met for 8 minutes with up to 7 EM education faculty in proximal private offices to facilitate rotation. Students and faculty were surveyed regarding the format. Institutional Review Board exemption was granted.

Impact/Effectiveness: Of 26 students pursuing EM, 23 (89%) participated in the SAS. The post-session survey was completed by 74% of students (17 of 23) and 100% of faculty (7 of 7).

Students met with an average of 6.25 faculty and over half were new to the students. All students found the SAS to be informative, an efficient use of time, and helpful to meet multiple faculty. Almost all found it to be fair and objective (94%) and were comfortable asking personal questions (88%). Students desired longer time intervals with each faculty (71%), but 77% felt their questions were answered adequately. Common discussion topics included: to which programs and how many to apply, likelihood of matching in EM, standardized letters, grades, United States Medical Licensing Examination scores, and career goals. Faculty reported no prior interaction with 60% of advisees. Fewer faculty than students preferred longer time intervals (43% vs. 71%) and 86% preferred speed-advising to traditional meetings. Though optimal structure and time allotment should continue to be explored, speed-advising allows students efficient interaction with multiple EM educators while addressing individual concerns about matching in EM.

17 Does the Extent of Medical Student Reflection Correlate with their Grade in an Emergency Medicine Clerkship?

Leuthauser A, Chary M, Hexom B, Hu K / Mount Sinai School of Medicine, New York, NY

Introduction: Many medical schools have begun to incorporate self-reflection exercises into their curricula. It is thought that these exercises help build a deeper understanding of material, and better academic performance. Students in clerkships are often reflect upon their performance but it is unclear if the exercise leads to better academic performance.

Objectives: The goal of this study was to evaluate the reflection of students in a one month emergency medicine (EM) clerkship to determine if there was a correlation between the degree of reflection and their final grade.

Methods: We conducted a retrospective case series, analyzing the performance and reflective statements of 116 students who participated in an EM clerkship at two clinical sites from 2013-2014. After each shift, an attending EM physician evaluated the student and the student could complete an optional reflection section, which was free text. We analyzed the correlation between the final grade, expressed in quartiles, and the degree to which the student completed the reflection using the Freeman-Halton extension of Fisher's exact test. A linguistic analysis was also performed to analyze the choice of words in the students reflection.

Results: Of the 145 possible records, 116 were included for analysis. The other 29 were excluded as they were visiting students. Two EM physicians graded the rate of completion of the self-reflection, demonstrating moderate agreement in their assessment (Cohen's kappa=0.55). The assessments of both raters were significantly correlated with final grade (p=0.006 and p=0.008). A linguistic analysis showed that the students with the lowest grades in the course wrote the least amount of reflection.

Conclusions: There is a correlation between the degree and quality of reflection with final grade in an EM clerkship. In future, as faculty preform the evaluations, they can encourage more insightful reflection from the students to improve their performance in the clerkship.

18 Effectiveness of Case-Based Learning Versus Traditional Models on Knowledge Retention

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Introduction/Background: Recent course evaluations from medical students and residents have demonstrated the need for medical education evolution; specifically decreasing lecture time while increasing the opportunities for the interactive case-based learning module. The objective of this project was to assess the quantitative impact on knowledge retention conferred by two different styles of medical education presentation; traditional vs. case-based learning.

Educational Objectives: We sought to quantify the effect of two instructional modalities, power point lectures (PPT) vs. case-based learning (CBL) modules on:

1) Initial knowledge gained (as measured by same-day pre- and post-curriculum knowledge assessments)
2) Knowledge retention (as measured by a post-curriculum exam given at 2 weeks)

Curricular Design: At the start of every Emergency Medicine (EM) block, an EM topic is presented to third year medical students during their orientation. For this project, we selected "An Introduction to Electrocardiography (ECGs)" (e.g., atrial fibrillation, ST segment elevation, tricyclic antidepressant toxicity overdose, Brugada). Every student took a fifteen question pre- and post-curriculum exam to assess their knowledge of ECGs. After two weeks, the students were asked to re-take this exam which sought to assess their ECG knowledge retention stratified by learning module. To date, we have collected data on 60 students.

Impact/Effectiveness: The mean positive change in pre- and post-curriculum test scores were comparable between students who received their instruction via traditional lecture vs. CBL (21%, 18%, respectively). As expected both groups experienced a loss on knowledge retention (e.g., a

negative mean change in test scores). However, this loss of knowledge retention was less among case-based learners vs. the traditional learners (1%, 7%, respectively, p=0.18).

Future directions include effect of the learners' curriculum satisfaction on knowledge retention.

19 Efficacy of iPad iTunes U Electronic Curriculum in Emergency Medicine Education

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Background: Recent theories suggest that adult learners respond better to self-directed learning over formalized learning processes. Additionally, Accreditation Council for Graduate Medical Education and the Residency Review Committee now allow 20% of required educational time to be done as "distance learning." The UC Irvine emergency medicine (EM) Residency Program implemented a distance-learning curriculum; it is iPad based and includes four modules per month.

Objectives: The primary outcome was improvement of In-Training exam scores. Our statistical goal was to compare the In-Training Exam Scores of those who consistently complete the iPad curriculum (defined by completion of >75% of modules) to those who did not. We hypothesized that those residents that more consistently completed the monthly modules would have increased In-Training Exam scores compared to those residents that do not.

Methods: The study was a prospective cohort study aimed to measure efficacy of the iPad curriculum. We analyzed the module, test and survey data from the 18 UCI EM Residents during 2013-2014.

Results: The statistical analysis involved a 2-sample t-test comparing those that completed 75% or more of the modules to those that completed less than 75% of the modules. The residents that completed 75% or more scored 2.2 points higher on the EM In-Training exam, however the difference was not significant (p=0.48).

Conclusion: Although we did see a slight improvement in residents who completed greater than 75% of the iPad modules the results were not statistically significant. Unfortunately, due to residency size we had a small sample size. The study was also limited by multiple confounding variables, including home studying methods, other changes to the UCI EM Curriculum, and resident lecture attendance. Overall the UCI EM Residents had positive comments about the iPad curriculum, and we will use the results of this study to help further shape the 2014-2015 iPad curriculum to be educationally beneficial and to expand this study with additional data points.

20 EM-Bound Medical Student Exam Performance on the EM-Advanced Clinical Examination (EM-ACE) and Versions 1 and 2 of the National EM M4 Exams

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Background: In April 2013, the National Board of Medical Examiners (NBME) offered an Advanced Clinical Examination (ACE) in emergency medicine (EM). In addition to this, the Clerkship Directors in Emergency Medicine (CDEM), have provided two (Versions 1 and 2), online high-quality, internally validated exams. While national usage statistics, including performance averages, are available for all 3 exams, it is unknown how career-bound EM students (i.e. those who match into EM) perform on the exams as compared to the entire national cohort. Interpretation of exam scores of EM-bound students may need to be adjusted if performance on national exams differs between EM- and non-EM-bound students. This study compares performance of students who matched into an EM residency in 2014 to students who did not on the EM-ACE and Version 1 (V1) and Version 2 (V2) of the National M4 EM exams.

Methods: In this retrospective multi-institutional cohort study, the EM-ACE and either V1 or V2 of the EM M4 exam was given to students taking a 4th year EM rotation at 3 institutions from April 2013 to February 2014. Exam performance, including the scaled EM-ACE score, percent correct on the EM M4 exams, and whether the student matched in EM in the 2014 National Resident Matching Program Match were collected. Students' t-tests were performed on the exam averages of students who matched in EM as compared with those who did not.

Results: 132 students from 3 institutions took the EM-ACE and one of the EM M4 exams. 35 students matched in EM in the 2014 Match. The mean score for EM-bound students on the EM-ACE, V1 and V2 of the EM M4 exams were 70.5, 84.9, and 83.3, respectively. Mean scores for non-EM-bound students were 68.0, 83.5, and 74.5. There was a difference in mean scores for V2 of the EM M4 exam only.

Discussion: In conclusion, there was no significant difference between performances comparing those who matched into an EM residency to those that did not on the EM-ACE or V1 of the EM M4, but there was in V2 scores for EM-bound and non-EM-bound students.

21 Emergency Medicine Residents Consistently Rate Themselves Higher than Attending Assessments on the ACGME Milestones

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Background: In 2012, the Accreditation Council for Graduate Medical Education (ACGME) introduced the Next Accreditation System, which implemented milestones to assess the competency of emergency medicine (EM) residents. While attending evaluation and feedback is crucial for resident development, perhaps equally important is a resident's self-assessment. If a resident does not accurately self-assess, clinical and professional progress may be compromised.

Objectives: Our study compared EM resident milestone evaluation by EM faculty with the same residents' self-assessment.

Methods: This observational cross-sectional study was performed at an academic EM residency. Twenty-five randomly chosen residents completed self-assessments using eight ACGME milestones deemed by residency leadership as "representative" of core EM principles. These residents were also evaluated by 20 faculty members. The milestones were evaluated on a nine-point scale. The average difference between resident self-ratings and faculty ratings were calculated. Sample t-tests were used to determine statistical significance of the difference in scores.

Results: Eighteen residents evaluated themselves. Each resident was assessed by an average of 16 attendings (min=10, max=20). Residents gave themselves higher ratings than attendings did for each milestone examined (all statistically signifiant with $p<0.0001$).

Conclusions: Residents over-estimated their abilities in every milestone assessed. This underscores the importance of feedback and assessment transparency. More attention needs to be paid to meth-ods by which residency leadership can make residents' clinical ability self-perception more congruent with that of their teachers and evaluators. The major limitation of our study is small sample size of both residents and attendings.

22 Emergency Medicine Selective Enhanced Mid-Clerkship Feedback Process Using an iPad Application

Kass D, Hultgren A, Pusic M, Lee S, Yingling S / NYU School of Medicine, New York, NY

Background: Mid-clerkship feedback (MCF), required by the Liaison Committee on Medical Education, ensures that students receive formative feedback during clerkships. However, reflective metrics are not commonly used in MCF. New York University School of Medicine (NYUSOM) uses an iPad app to collect students' self-assessment data alongside preceptor assessment of student performance during the MCF.

Educational Objectives: We introduced the app into our emergency medicine Selective (EM-Sel) and compared its functioning to that of a paper rating form.

Methods: Starting in March 2014, all NYUSOM students receive iPads for use in clerkships. NYU developed an app that presents a 6-item form to students [S] to self-rate and then to their preceptors [P] to submit ratings during the MCF process. The items are based on the Reporter-Interpreter-Manager-Educator framework, and Professionalism and Procedural Skills. Upon completion, the app displays a composite view that frames the MCF conversation. This data is stored in our data warehouse. For comparison, we also present the ratings collected on paper forms for the students without iPads. All sessions were conducted by the same two preceptors.

Results: From January to November 2014, 72 students engaged in an EM-Sel MCF. The app was used in 26 sessions and the paper form was used in 46 sessions. On review, we had complete PRIMES ratings data from both students and preceptors for 100% (26/26) of the iPad sessions but only 63% (29/46) of the sessions with paper forms.

Of the 72 data sets collected, 55 paired ratings were complete (76%); 26 were collected on iPads and 29 were collected on paper. Average [S-P] rating concordance ranged from 56% for Professionalism to 78% for Interpreting.

Conclusion: Use of this app resulted in complete documentation of [S-P] ratings for the Em-Sel MCF, which

Table 1. Rating discrepancies.

Sub-competency	Mean difference ± standard deviation	Limits of agreement	95% CL mean difference	*p*-value
Communication	1.1203 ±1.6534	(-2.1865,4.3299)	(0.9295,1.3110)	<0.0001
Diagnosis	1.2818 ±1.6048	(-1.9278,4.4914)	(1.0966,1.4669)	<0.0001
Diagnostic studies	1.3368 ±1.5768	(-1.8168,4.4904)	(1.1548, 1.5187)	<0.0001
Disposition	0.9759 ±1.7048	(-2.4337,4.3855)	(0.7793, 1.1726)	<0.0001
Emergency stabilization	0.7938 ±1.5309	(-2.2680,3.8556)	(0.6172, 0.9704)	<0.0001
History and physical	1.2921 ±1.7441	(-2.1961,4.7803)	(1.0909, 1.4933)	<0.0001
Multi-tasking	1.3540 ±1.6448	(-1.9356,4.6436)	(1.1642, 1.5437)	<0.0001
Team management	0.5808 ±1.4772	(-2.3736, 3.5352)	(0.4103, 0.7512)	<0.0001

was not seen with the paper form. Storage of complete data allows students and preceptors to reflect on the contents of the MSF sessions at a later date.

23 Enhancing Resident Engagement and Knowledge Retention through Curricular Modifications

Bavolek R, Wagner J / Washington University in St. Louis School of Medicine, St. Louis, MO

Background: Emergency medicine is a specialty filled with individuals ill suited to sit in a lecture hall for long periods. Despite this, 5 subsequent hours of 50 minute blocks are commonly used to meet Residency Review Committee conference requirements. These prolonged sessions test the patience of the audience and impact knowledge retention.

Educational Objectives: At Washington University School of Medicine, we've implemented changes to combat boredom while enhancing retention.

Curricular Design: We addressed the issue of fatigue and boredom when sitting through 5 hours of lecture by dividing lectures into 25 minute slots rather than the traditional 50 minutes. This rapid-fire lecture style minimizes lapses in attention, which studies have shown occur roughly every 10-15 minutes. One challenge has been preventing lecturers from delivering 50 minutes of content in only 25. Additionally, the audience must get adequate breaks, as most people cannot maintain continuous attention for more than about 45 minutes. We addressed this obstacle by using a timer that runs continuously during conference, giving the speaker a 5 minute warning followed by an alert that their lecture time is over. This dramatically improves the ease in which a long-winded lecturer can be curtailed. Finally, we implemented spaced-repetition. This is a well-proven method of enhancing knowledge retention. The key points are repeated to the residents 3 times. First during the lecture itself, second as a rapid-fire summary of the entire day of content at the end of conference, and a third time as a faculty run review the following week.

Impact: As this is a cutting-edge curricular change, we have little evidence to its effectiveness. While we don't have internal evidence, there is a large body of educational literature to support these initiatives. Conference feedback and evaluations improved dramatically over the past six months. Our hope is that inservice scores will reflect the benefit of our new curricular design.

24 Exploratory Factor Analysis of Patient Ability to Differentiate Individual Core Competencies During Evaluation of Resident Clinical Performance

Ryan J, Barlas D / New York Hospital Queens, Flushing, NY

Background: Patient evaluation of resident performance has been included as part of 360 degree evaluations by the Residency Review Committee of Emergency Medicine. Despite their use in most residency programs, little research has been done to evaluate the metrics of patient evaluations.

Objectives: We sought to determine the ability of emergency department (ED) patients to differentiate individual core competencies when asked to evaluate resident clinical performance.

Methods: This prospective observational study was conducted at an urban ED with a postgraduate year 1-3 emergency medicine residency program comprised of 30 residents. Each resident was evaluated by approximately 10 patients over a 2 month period on a competency-based evaluation questionnaire. The questionnaire was administered to patients by a trained research assistant and resident performance on 8 competency based items was rated on a fixed 9 point scale. Surveyed patients were selected randomly by the research assistant during clinical shifts from the patient log without resident knowledge. Pearson correlation coefficients across each resident's score for the competency based questions were analyzed in a correlation matrix.

Results: During the 2 month period of the study 286 patients evaluated 29 residents yielding an average of 9.8 evaluations per resident. To determine whether patients were able to separate and rank residents on the individual competencies we compared Pearson correlation coefficients across each resident's score for the competency based questions. The resulting correlation matrix yielded 28 combinations. The patient rankings for all of these scores were highly correlated. The correlations ranged from 0.78 to 0.97 and all were significant at $p<0.001$.

Conclusion: When patients evaluate resident performance using a competency based form, the results obtained across multiple competency based questions are highly correlated. Patients do not discriminate well between individual competency based constructs when performing clinical evaluations of residents.

25 Faculty Prediction of In-training Examination Scores of Emergency Medicine Residents: A Multi-center Study

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Background: The Emergency Medicine In-Training Examination (EMITE) is one of the few valid tools for medical knowledge assessment in use by emergency

medicine (EM) residencies. Review of EMITE performance helps programs identify resident weaknesses in core content knowledge, but its use as a formative assessment tool is limited by infrequent administration. If EM faculty could accurately predict residents' EMITE scores, then residents with medical knowledge deficiencies could be identified earlier, providing time to institute remediation.

Objectives: To conduct a multicenter trial to evaluate the ability of EM faculty to predict EMITE scores.

Methods: This was a prospective, multicenter trial involving five EM residencies. Institutional review board approval was obtained by all sites. EM faculty were asked to predict 2014 EMITE scores of their residents using an online survey instrument. The primary outcome was prediction accuracy (the proportion of predictions within 6% of the actual score). The secondary outcome was prediction precision (the mean deviation of predictions from the actual scores). We also assessed faculty background variables, including years of experience, educational leadership status, and clinical hours worked.

Results: 111 faculty physicians participated, rendering 3,219 predictions for 147 residents. The mean prediction accuracy was 60% (95% CI:[57.5-62.6%]) and the mean prediction precision was 6.3% (95% CI:[6.0-6.6%]). Prediction accuracy was not significantly different between educational leaders (63.9%, 95% CI:[60.4-67.4]) and non-educational leaders (58.4%, 95% CI:[44.2-61.6]) and there was no correlation with other faculty background variables. Only eight participants predicted scores with high accuracy (>80%).

Conclusion: In this multicenter study, EM faculty possess only moderate accuracy at predicting resident EMITE scores. This finding calls into question the ability of faculty to accurately assess a standardized marker of resident medical knowledge.

26 Feasability of Improving Bedside Teaching through Targeted Simulation-Based Education for Faculty

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Background: Long lasting learning is maximized when educational activities are paired with matched clinical bedside teaching. Conversely, lack of bedside teaching for a given topic likely impairs any educational initiative to close knowledge gaps. Managing ventilators in the emergency department is an example of a topic with potential asynchrony of formal education and practical bedside teaching.

Objectives: To determine if targeted simulation-based faculty education could enhance bedside teaching in the domain of mechanical ventilation.

Methods: First, a needs analysis was performed at an urban community academic hospital, asking emergency medicine residents to rate the frequency of bedside teaching when caring for patients who require mechanical ventilation on a rating scale of 1 to 4 (1=never, 4=always). A prospective cohort study was then done on 27 out of 44 faculty members who participated in a one-hour advanced simulation-based mechanical ventilation course. Faculty self-rated their pre- and post-course competency of ventilator management on a novice to expert Dreyfus scale from 1 to 5. They also rated their current frequency of bedside teaching regarding ventilator management and their anticipated frequency of teaching after completing the course on a rating scale from 1 to 4 (1=never, 4=always).

Results: 33 of 48 residents responded to the needs analysis survey, with average and median ratings of 1.52 and 1, respectively. Before and after the course, average faculty self-ratings of competency on the Dreyfus Scale improved from 2.7 to 3.6 ($p<0.001$), with median ratings improving from 3 to 4. Average ratings of current and anticipated frequency of bedside teaching improved from 2.3 to 3.1 ($p<0.001$), with median ratings improving from 2 to 3.

Conclusion: Emergency medicine residents report a low frequency of bedside teaching related to mechanical ventilation. Targeted simulation-based education for faculty has the potential to significantly improve the frequency of bedside teaching of this topic.

27 Get Feedback Now: How to Best Use Your Residency Management Software to Increase the Response Rate and Quality of Conference Evaluations

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Introduction: Feedback is a vital ingredient for successful post-graduate medical education. It is required by the Accreditation Council for Graduate Medical Education for assessment and improvement of key aspects of the residency program, one of which is the mandatory weekly conferences. Audience feedback allows for presenters and residency leadership to make adjustments to future content to better meet the needs of the residents. It is most useful when the collective feedback is numerous, timely, and organized.

Educational Objectives: Optimize collection of feedback survey forms using a residency management software, handheld technology (tablet/smartphone), internet access, and protected time following presentations.

Curricular Design: A prospective cohort study of emergency medicine residents and teaching faculty at an academic hospital was conducted. Evaluations of weekly residency conferences were collected from 8/7/14-11/20/14 using the "Conference Survey" function within the New Innovations?

residency management software. Three subgroups: random, delayed, and immediate response, were analyzed. Evaluation survey forms were web-based and automatically emailed to all attendees following each conference presentation. The random group completed evaluations at their leisure. The delayed group was provided a 10-minute block of protected time to complete evaluations at the end of the 4-hour conference block. The immediate group was given 2-3 minutes of protected time to complete evaluations after each hourly presentation. All residents had handheld devices and Internet access.

Impact: By providing residents with handheld technology, internet access, web-based surveys, and protected time immediately following presentations, we doubled the response rate to the feedback surveys (Table 1). The residency management software automated the generation, collection, and storage of surveys. Additional functions can easily configure, manipulate, summarize, and export the data.

Table 1. Response rate to survey forms evaluating residency conferences.

	Survey response rate	Comment rate
Random group	35% (507/1435)	7.5% (107/1435)
Delayed response	66% (67/101)	8.9% (9/101)
Immediate response	74% (79/107)	21% (22/107)

28 Global Health and Graduate Medical Education: A Systematic Review

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Background: Global health (GH) interest is peaking in graduate medical education (GME); many residencies now offer curricula in GH. The popularity of GH has created growth in medical education literature surrounding this topic.

Objectives: We aim to provide a systematic review of published approaches to GH in GME. Methods: We searched PubMed using variable terms to identify articles? with abstracts published between January 1975-April 2014 focusing on GH GME. Methodological quality was assessed using the Medical Education Research Study Quality Instrument (MERSQI), which has demonstrated reliability and validity. Articles meeting inclusion criteria were evaluated for content by two reviewers to ensure reliability.

Results: Overall 60 articles met inclusion criteria; 16 articles were evaluated by two authors to ensure inter-rater reliability. Intraclass correlation coefficient was excellent (Table 1). Articles represented research and curriculum from a number of specialties at variable institutions. Overall study quality was found to be poor. Many studies lacked multiple institution analysis, randomization, evidence supporting clinical benefit and poor reliability and validity evidence. The mean MERSQI score was 7.57 Â± 2.79 (Â± SD) out of a possible score of 18 (Table 2).

Table 1. Intraclass correlation coefficient for individual MERSQI questions.

MERSQI item	Intraclass correlation coefficient (95% CI)
Study design	1.00 (NA)
Institutions	1.00 (NA)
Response rate	0.99 (0.88-1.00)
Type of data	1.00 (0.99-1.00)
Validity-internal structure	1.00 (0.99-1.00)
Validity-content	1.00 (0.94-1.00)
Validity-relationships to variables	1.00 (NA)
Appropriateness of analysis	1.00 (NA)
Sophistication of analysis	1.00 (0.83-1.00)
Outcome	1.00 (0.99-1.00)
Total	1.00 (0.99-1.00)

MERSQI, medical education research study quality instrument

Conclusions: Overall there is significant heterogeneity in curriculum with no single strategy for teaching GH in medical education.The quality of literature (as determined by MERSQI scores) were of poor methodological quality. Deficiencies in medical education research are already widely acknowledged and GH literature is no different. GH-related manuscripts have a lower mean MERSQI score than previously studied medical education manuscripts (7.57 vs. 10.7). GH medical education literature is a field that must demand increased rigor in study methodology. Improved methods of curriculum evaluation and publication guidelines would ensure positive impact on educational quality.

Table 2. Average and standard deviation of individual MERSQI scores (n=60).

Question	Average	Standard deviation
1	1.13	0.33
2	0.61	0.29
3	0.65	0.67
4	1.34	0.91
5	0.20	0.40
6	0.52	0.50
7	0.13	0.34
8	0.74	0.44
9	1.15	0.44
10	1.10	0.26
Total	7.57	2.79

MERSQI, medical education research study quality instrument

29 Have Incoming PGY-1 Residents Achieved Level 1 Milestones?

Cassara M, Doty C, Bond M, Seamon J, Gonzalez A, Weizberg M / Hofstra North Shore-LIJ School of Medicine, Woodmere, NY; University of Kentucky, Lexington, KY; University of Maryland School of Medicine, Baltimore, MD; GRMEP/Michigan State University, Grand Rapids, MI; Staten Island University Hospital, New York, NY

Background: As of July 1, 2013 residents training in Accreditation Council for Graduate Medical Education (ACGME) accredited Emergency Medicine (EM) residencies must be evaluated on a continuum across 23 milestones (MS). The MS have subcompetencies (SC) that capture a resident's progression along a continuum from novice (medical student - Level 1) to expert (seasoned EM attending " Level 5). It is assumed that incoming postgraduate year one (PGY-1) residents have achieved Level 1 SC of the MS. This has not been prospectively validated. Our purpose was to evaluate incoming PGY-1 residents to assess what percentage have achieved level 1 for the eight SC assessing patient care (PC 1-8).

Objectives: Primary objective: What percentage of incoming PGY-1 residents have achieved level 1 for care-based SC? Secondary objective: How accurate are incoming PGY-1 residents at self-assessing their SC level of MS?

Methods: Incoming PGY-1 residents at 5 EM residencies were scored by faculty and themselves to determine if they had achieved level 1 on SC PC 1-8, at the end of their 1st month of internship (Figure 1). Faculty assessments (FA) were done by 3 separate faculty members on 3 separate occasions. The majority response was taken as the final determination. Only PGY-1 residents who graduated medical school in the last year were included.

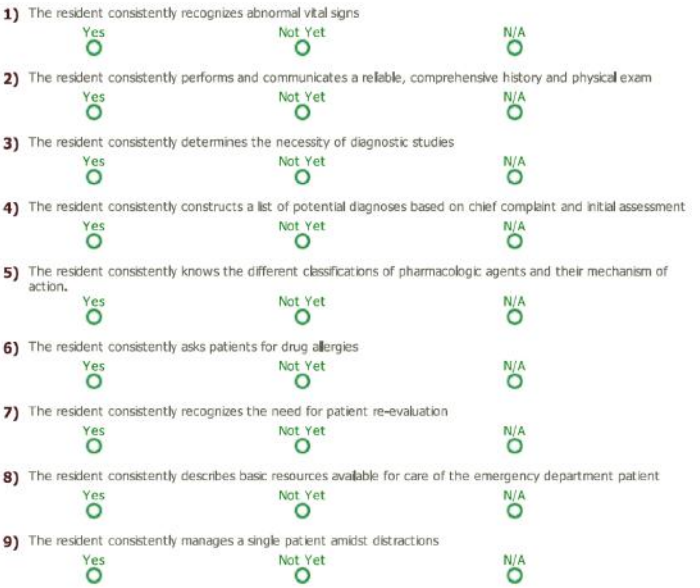


Figure 1. The nine questions that address the eight patient care sub-competencies that were evaluated.

Performance anchors were taken directly from the ACGME MS. Faculty and PGY-1 residents responded if they had achieved the SC or not. Means were compared using Fischer's exact test.

Results: There were 35 PGY-1 residents at 5 residency programs. 3 subjects were excluded. Mean age 27.8; 57.1% male. The percentage of PGY-1 residents that achieved level-1 on FA ranged from 44.1%-100%, and on self-assessment (SA) from 17.5% to 100% (Table 1). SA was lower than FA for several SC. The majority of PGY-1 residents achieved level 1 on all SC except PC5a (classification of pharmaceutical agents).

Conclusions: The majority of PGY-1 residents achieved level 1 on 7 of 8 PC SC. SAs were lower than FAs for several SC.

Table 1.

	Subcompetency	Level 1 milestone	Faculty	Self	Difference	*p*-value
PC1	Emergency stabilization	Recognizes abnormal V/S	100%	100%	0%	1
PC2	Performance of focused History and physical exam	History and physical	91.4%	85%	6.4%	0.49
PC3	Diagnostic studies	Diagnostic studies	57.1%	42.5%	14.6%	0.25
PC4	Diagnosis	Potential diagnoses	62.9%	80%	17.1%	0.13
PC5a	Pharmacotherapy	Classifications of pharmacologic agents	44.1%	17.5%	26.6%	0.02
PC5b	Pharmacotherapy	Drug allergies	91.4%	72.5%	18.9%	0.04
PC6	Observation and reassessment	Re-evaluation	94.3%	75%	19.3%	0.03
PC7	Disposition	Describes resources	77.1%	48.7%	28.4%	0.02
PC8	Multi-tasking	Manages single patient	94.3%	80%	14.3%	0.09

30 High Efficiency Linguistics Program for Spanish (HELPS): A Cyclic Curriculum for Improving Intrinsic Spanish Language Capacity

Burt D, Jones T, Silber J, Woods W / University of Virginia, Department of Emergency Medicine, Charlottesville, VA

Introduction: The US Latino population is increasing rapidly and lack of Spanish-speaking providers often impedes medical care in emergent situations. Emergency medicine (EM) residents (and their training programs) acknowledge this need, but lack access to flexible language programs that fit resident schedules. In response, the High Efficiency Linguistics Program for Spanish (HELPS) curriculum was developed.

Educational Objectives: To design a flexible Spanish language curriculum (based on Second Language Acquisition principles) that is adaptable to each user, flexible in timing and economical. It would also need to accommodate resident work schedules (and variability) and include measurement of language progress.

Curricular Design: A flexible curriculum involving: (1) individualized language lessons on-line (2) weekly assigned homework and (3) technology-based learning resources (Ear/Voice time) was developed. Participants were asked to commit 3 hours each week to these activities. A cohort of (7) 1st year emergency medicine residents and (12) 1st and 2nd year medical students was recruited. Participants self-reported weekly hours spent on each activity; this was validated with their teachers. An assessment of language progression was also completed with each participant.

Impact/Effectiveness: Participants were assessed over a 10-week period; during this time each participant completed at least 10 one-hour lessons on-line and charted homework and Ear/Voice hours completed. Over 90% of the time participants were able to complete weekly requirements including on-line lessons. EM residents (compared to medical students) had slightly more difficulty completing the 3 hours per week during off-service rotations but not while in the emergency department. All participants reported significant progress in their Spanish skills, most were satisfied with the program, and over 80% hoped to continue lessons after the pilot. Plans are in place to offer this program to additional EM residents and develop it into a more robust 3-year curriculum.

31 How Do Resident Self-Ratings Compare to the Clinical Competency Committee's Rating of Milestones

Woodward C, Caffery T, Jones G, Musso M / LSUHealth-Baton Rouge, Baton Rouge, LA; LSUHealth-New Orleans, Department of Family Medicine, New Orleans, LA

Background: In July 2013, the Accreditation Council for Graduate Medical Education (ACGME) began restructuring previously defined competencies to be based on milestones. Despite implementation of the milestones, there is little data regarding their reliability or validity.

Objective: To examine how well the Clinical Competency Committee (CCC) ratings correspond to resident self-ratings on the milestones.

Methods: The CCC rated residents on the milestones in June 2014. Residents were asked to rate themselves in June 2014, prior to receiving the results of their semi-annual evaluations. Possible scores on the milestones range from 1 (medical school graduate) to 5 (practitioner with many years of experience).

Results: The faculty and residents' ratings were all significantly correlated ($p<0.01$), with Pearson's r coefficients ranging from 0.52 to 0.85. A MANOVA revealed significant differences in ratings by postgraduate year (PGY) ($p<0.0001$). Residents' self-evaluations differed significantly compared to the CCC ($p<0.0001$). A significant interaction indicated the size of the discrepancy between resident and CCC ratings differed by PGY year ($p<0.01$). The largest discrepancies were between PGY1 and CCC ratings (averaging 0.74 points), the smallest discrepancies for PGY3 ratings (averaging 0.18 points), with PGY2 in between (averaging 0.46 points).

Conclusion: The high correlations between CCC and resident ratings provide support for validity. There are two possible interpretations for the significant interaction and the pattern of reducing discrepancy with greater years in the program. (1) PGY1's tend to overestimate their competencies, while PGY3's are fairly accurate about their competencies, with PGY2's falling in between. (2) CCC members rate residents based strictly on year in residency, while residents are using other criteria for placing themselves on the milestones. Using this interpretation, residents in their third year would rate themselves more similarly compared to the CCC, as scores approach the ceiling.

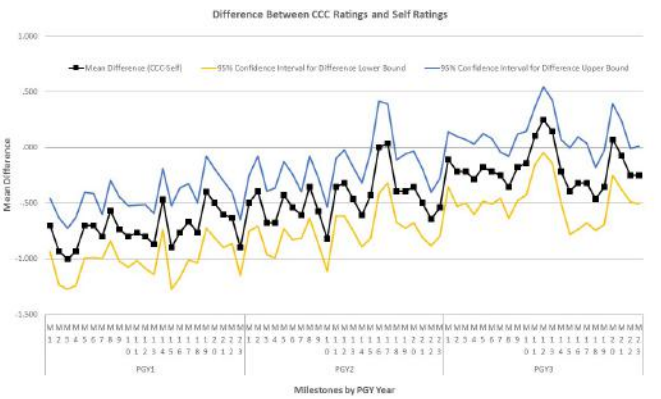


Figure 1.
CCC, Clinical Competency Committee

32 Identification of Professionalism through a Values Based Interview

Thaxton R, von Schweinitz B / San Antonio Uniformed Services Health Education Consortium, Fort Sam Houston, TX

Background: Literature has proposed a link between professionalism and success in graduate medical education. However, it is unknown how to identify residents, during the interview process, which would be at an increased risk for disciplinary actions related to professionalism. Previously, we presented an interviewing technique that could potentially identify residents at having a higher probability for residency disciplinary actions in the professionalism competencies.

Objective: This is a continuation of our previous study and the results of the changes instituted in the interviewing process.

Methods: A values-based interview was conducted on potential applicants looking at a resident's values, personal beliefs, and motivations. Responses were divided into having either an internal/personal focus or an external/humanistic focus. We then followed the residents through the course of their training and compared their interview responses to the number of professionalism violations.

Results: The pilot study from 2006-2010 had 61 evaluations available for analysis with 11 residents having disciplinary actions. 9 (15%) had disciplinary actions related to professionalism. Of these, 8/9 (89%) had an internal focused interview. In 2010 we started to select a higher number of residents with a external focused interview.

Our current analysis (2010-2014) has 59 evaluations for available for review with 17 residents having disciplinary actions. Of these, 5 residents, all with internal focused interview had disciplinary action related to professionalism.

Conclusion: Personal professional values can be quantified indirectly via presence of disciplinary action in graduate medical education. Additionally, the use of a values-based interview can be used to predict a higher likelihood of having disciplinary actions in graduate medical education.

33 Implementation of a Modified Version of Team Based Learning in Emergency Medicine Resident Education

Andrews-Dickert R, Seamon J, Detwiller M, Judge B / Grand Rapids Medical Education Partners / Michigan State University, Grand Rapids, MI

Introduction: Team Based Learning (TBL) has been used in multiple disciplines as an effective educational tool. A challenge to implementing TBL into graduate medical education (GME) curriculum is that sessions are time consuming for residents to participate in and for faculty to develop and lead. We introduced a modified version of TBL in an emergency medicine residency program to cover the Model of the Clinical Practice of Emergency Medicine during weekly reading club sessions.

Objectives: Primary objective: To develop a practical way to implement a sustainable model of TBL in our preexisting weekly reading club which consisted of a postgraduate year-3 (PGY-3) resident leading didactic sessions through assigned reading, followed by monthly quizzes.

Secondary objectives: To increase resident compliance with reading assignments, increase learning and participation during reading club, and develop team participation and communication skills.

Design: Residents were divided into teams of 5-6 people. Residents took a weekly quiz individually - the Individual Readiness Assurance Test (IRAT), which covered assigned readings. Quizzes consisted of 5 multiple choice questions. Following the IRAT, the teams worked on the same questions - the Group Readiness Assurance Test (GRAT), and then received immediate feedback on their answers. A PGY-3 resident then led the whole group in discussion of the quiz and key points from the reading. This modified TBL did not include an Application Activities section secondary to time constraints and limited faculty resources.

Impact: Our program has successfully implemented weekly modified TBL reading club experiences since January 2013. Implementation of modified TBL to reading club has been positively received by residents. In an anonymous survey, 100% of residents preferred the modified TBL sessions compared to the preexisting reading club model. Residents also report that they read more, appreciate the interactive discussions, and benefit from vertical learning during the GRAT.

34 Implementation of a Senior Resident Directed Daily Oral Boards Teaching Case to Improve Junior Resident Education and Provide Structured Senior Resident Teaching

Welsh L, Wittels K, Aaroson E, Nadel E, Bhatia K / Brigham and Women's Hospital, Boston, MA

Introduction: With increasing clinical demands, emergency medicine (EM) residency programs must find innovative ways to continue providing direct on-shift teaching. In addition to clinical education, residency programs must also prepare their graduates for the EM licensing exams, including the oral boards, which can be a source of anxiety for graduating residents.

Educational Objectives:

1. To familiarize residents with the oral boards format through a peer-led, daily teaching case
2. To improve the knowledge base of junior residents via case-based discussion
3. To cultivate the skills of senior residents as physician educators

Curricular Design: Each teaching session lasts 15 minutes and occurs during afternoon rounds. Oral boards cases are chosen from a commercially available source. A senior resident moderates each case and a junior resident acts as the oral boards examinee. At the case conclusion, the senior resident solicits questions from all residents. They provide teaching points and are encouraged to relate the case to a patent presentation from that shift. A monthly orientation email is sent to all residents and includes a template of the oral boards format. The residents are emailed monthly to solicit feedback.

Impact: This innovation provides an easily implementable means to expose residents to the oral boards format and through repetition, increases familiarity with that format. In a survey of residents conducted 5 months after the initiation of these teaching sessions, the majority of participants expressed an increased level of comfort with the oral boards format (Figure 1). With regards to EM knowledge base, 14 of 15 junior residents somewhat or strongly agreed with the statement, "Participating in the oral boards cases has improved my understanding of core EM topics." Finally, this interactive format provides senior residents experiences with both didactic teaching and the opportunity to practice deliberate feedback with the examinee.

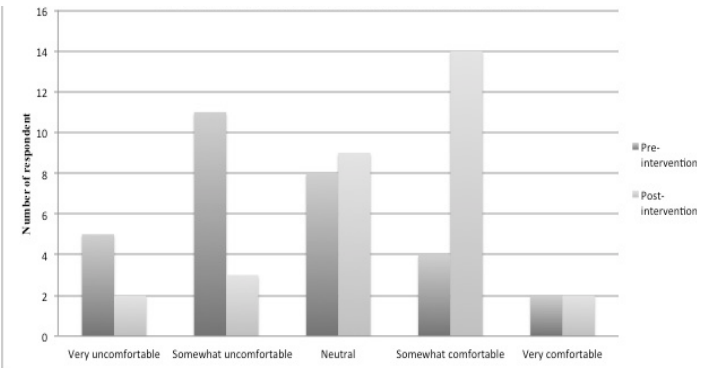


Figure 1. Resident reported comfort level with the oral board format before and after implementation of a daily oral boards teaching case.

35 In the Eye of the Beholder: Differences in Perception of Patient Turnover Between EM and IM Residents

Kong C, Bishop-Rimmer E, Brodsky T, Panchal N, Mastanduono A, Khan F / Mount Sinai Beth Israel, New York, NY

Background: Insufficient patient handoffs causes a significant source of medical errors that can lead to serious morbidity and mortality. Proper communication of patient disease, treatment, and pending issues is essential to patient safety and quality of care.

Objectives: 1) Identify differences between Emergency Medicine (EM) and Internal Medicine (IM) residents' perceptions of patient turnover between the two specialties 2) Identify areas to improve communication.

Methods: This study utilized a 12 question survey to poll EM residents (n=29) and IM residents (n=49). A Wilcoxon rank-sum test was used to analyze data and a p value of 0.004 was assumed as significant after applying a Bonferroni adjustment. Eligible participants were all EM residents and second/third year IM residents with hospital admissions experience.

Results: 29/36 eligible EM and 49/70 eligible residents completed the survey. EM residents felt more strongly that current handoff strategies are comprehensive (p=0.0005), efficient (p=0.0029), and safe (p=0.0018) when compared to IM residents. IM residents reported that often patient turnover from the emergency department did not correlate to the patient's needs (p=0.0008) and bed requests often needed to be changed to match the patient's level of care (p=0.0001). IM residents felt more strongly that there needs to be improvement in patient handoff between specialties when compared to EM residents (p=0.00001). Both EM and IM residents agreed that standardizing verbal and written sign-out and improving electronic medical record documentation are possible ways to improve communication.

Conclusions: There are significant differences in perception of patient hand off between EM and IM residents. EM residents are generally satisfied with patient turnover while IM residents feel that there needs to be improvement in current practices. Possible outlets for improvement are standardization of verbal and written handoffs between providers.

36 Incorporation of Team Based Learning in Emergency Medicine Residency Training

Farina G, Bloch H, Fornari A / Hoftra North Shore LIJ School of Medicine at Long Island Jewish Medical Center, New Hyde Park, NY

Educational Goal: To introduce Team Based Learning (TBL) as an alternative to didactic lectures in an emergency medicine (EM) residency program.

Background: The Accreditation Council for Graduate Medical Education (ACGME) requires 5 hours per week of regularly scheduled didactic conferences for EM. Many undergraduate and graduate schools have shifted to small group learning, case based instruction and in some institutions TBL but residency programs for the most part have not.

Methods: The EM Residency Program at LIJ is fully accredited with 47 residents. In selected sessions TBL sessions were implemented during scheduled didactics. Prior to the session residents were assigned reading assignments and a case related to the topic. At the beginning of the TBL session the residents were divided randomly into groups of 5-6 so that each group consisted

of an equal number of senior and junior residents. The case was presented followed by an Individual Readiness Assurance Test (IRAT) based on the assigned readings. After the IRAT, the same test was administered to the teams Group Readiness Assurance Test (GRAT) and the teams simultaneously displayed their answers using lettered cards. Discussion and misunderstanding of content or error in reasoning were resolved. If all teams displayed the same answer, the instructor added a pearl or raised a question to stimulate discussion. The groups then discussed the case and presented and defended their final diagnosis. Preliminary satisfaction data was collected from the residents. The scale had 6 criteria that were scored from strongly disagree (1) to strongly agree (5). Comments from residents included "loved it", "every lecture should be TBL".

Conclusion: TBL was successfully implemented into our resident conference. We plan to formally study the learning by residents and continued effectiveness of TBL in our EM curriculum comparing traditional didactic and TBL format.

Table 1. Results (n=79).

Understanding	4.53
Challenged	4.56
Engaged	4.70
Peer contribution	4.70
Productive	4.53
Enjoyable	4.71

37 Increasing the Clinical Competency Committee's Meeting Efficiency via a Novel Data Collection Tool: The Resident Report Card

Conrad C, Panicello K / Stony Brook University Hospital, Stony Brook, NY

Introduction/Background: Research has shown that productivity declines rapidly after 90 minutes in a meeting, and Clinical Competency Committee (CCC) meetings initially were taking more than 8 hours. Residency programs track myriad clinical and institutional measurements. This process is time-consuming and labor-intensive, with no pre-existing tool to streamline the system.

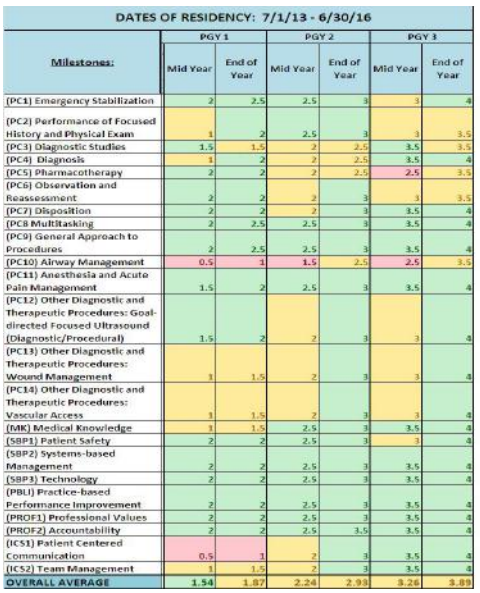
Educational Objectives: A high level, objective data collection tool to consolidate and maintain milestone, credentialing, institutional, and resident produced data was paramount to our success. The intent of the resident report card was to streamline the milestone process for the Clinical Competency Committee (CCC) by having all of the necessary data centrally located prior to the meetings in order to shorten the meeting time required to complete the assessments.

Curricular Design: The information available on the resident report card is extracted from various resources. Our residency management software (RMS) utilized by the institution is a rich resource, but difficult to access and reports are not easily customizable by our program.

The resident report card was created on a data management suite spreadsheet which enables it to be a living, breathing document that can constantly be updated and changed.

Impact/Effectiveness: Our initial CCC meetings were extremely long and disorganized. The last CCC meeting prior to the implementation of the report card was identical in process and content as the first meeting using the report card, with a reduction of over 4 hours in meeting time.

The universal availability of the electronic spreadsheet application used to create and maintain the report allows for ease of distribution, customization and utilization regardless of an institution's RMS, data collection or access to resources. This simple, yet elegant tool has transformed our CCC meetings, and we feel that other programs and even specialties can use this tool to help mitigate the data overload residencies face.



DATES OF RESIDENCY: 7/1/13 - 6/30/16						
Milestones:	PGY 1		PGY 2		PGY 3	
	Mid Year	End of Year	Mid Year	End of Year	Mid Year	End of Year
(PC1) Emergency Stabilization	2	2.5	2.5	3	3	4
(PC2) Performance of Focused History and Physical Exam	1	2	2.5	3	3	3.5
(PC3) Diagnostic Studies	1.5	1.5	2	2.5	3.5	3.5
(PC4) Diagnosis	1	2	2	2.5	3.5	4
(PC5) Pharmacotherapy	2	2	2	2.5	2.5	3.5
(PC6) Observation and Reassessment	2	2	2	3	3	3.5
(PC7) Disposition	2	2	2	3	3.5	4
(PC8 Multitasking	2	2.5	2.5	3	3.5	4
(PC9) General Approach to Procedures	2	2.5	2.5	3	3.5	4
(PC10) Airway Management	0.5	1	1.5	2.5	2.5	3.5
(PC11) Anesthesia and Acute Pain Management	1.5	2	2.5	3	3.5	4
(PC12) Other Diagnostic and Therapeutic Procedures: Goal-directed Focused Ultrasound (Diagnostic/Procedural)	1.5	2	2	3	3	4
(PC13) Other Diagnostic and Therapeutic Procedures: Wound Management	1	1.5	2	3	3	4
(PC14) Other Diagnostic and Therapeutic Procedures: Vascular Access	1	1.5	2	3	3	4
(MK) Medical Knowledge	1	1.5	2.5	3	3.5	4
(SBP1) Patient Safety	2	2	2.5	3	3	4
(SBP2) Systems-based Management	2	2	2.5	3	3.5	4
(SBP3) Technology	2	2	2.5	3	3.5	4
(PBLI) Practice-based Performance Improvement	2	2	2.5	3	3.5	4
(PROF1) Professional Values	2	2	2.5	3	3.5	4
(PROF2) Accountability	2	2	2.5	3.5	3.5	4
(ICS1) Patient Centered Communication	0.5	1	2	3	3.5	4
(ICS2) Team Management	1	1.5	2	3	3.5	4
OVERALL AVERAGE	1.54	1.87	2.24	2.93	3.26	3.89

Figure 1.
PGY, post-graduate year

In-Training Examination:	Score	Percentile
PGY 1	72%	52
PGY 2	74%	36
PGY 3		

In-Training SCORE Key:
In-Training Score: < PGY 1 Score
In-Training Score: = PGY 1 Score
In-Training Score: = PGY 1 Score

In-Training PERCENTILE Key:
In-Training Percentile: = 30 %
In-Training Percentile: = 30%

USMLE/COMLEX	Exam Date	Score	%	
USMLE STEP 1	6/1/2010	215		
USMLE STEP 2	10/1/2011	234		
USMLE STEP 2 CS	12/1/2011	Passed		
USMLE STEP 3	Taken	227	Step 3 Date: 4/22/2013	

USMLE/COMLEX KEY
USMLE STEP 2 CS PASS
USMLE STEP 2 CS FAIL
USMLE STEP 3 REGISTERED
USMLE STEP 3 NOT REGISTERED
Taken

Figure 2.
PGY, post-graduate year

38 Innovations in Undergraduate Medical Education: A Novel Elective for Third Year Medical Students, Emergency Critical Care

Leuthauser A / Mount Sinai School of Medicine, New York, NY

Introduction: Until now, there have been no third year medical student emergency medicine (EM) electives at our institution. There were a number of students that wanted to explore EM, and so the need for this elective to fill that void became obvious.

Education Objectives: To expose the learner to the emergency department (ED) in a way that was unique and different from the required clerkship, giving the student and exposure to emergency critical care and comfort with the ED prior to their required clerkship.

Curricular Design: The elective is entitled Emergency Critical Care and has a two week designed curriculum, which has a unique offering for the learner in that they divide their time in the resuscitation area of the ED, and follow their patients through their hospital course in the intensive care units. The students round with the intensive care unit teams and gain a unique perspective on the patients disease processes and can better understand the critical interventions performed in the ED and how that translates to outcomes for those patients. They also benefit from direct teaching from the ED attendings and critical care resident on their clinical shifts, as well as a didactic curriculum focused on the critically ill patient, which includes a critical care textbook, an introduction and debrief with the course director. The learner is required to write a case report on a memorable patient with the goal of presenting it at their medical school student research day.

Impact/Effectiveness: At this time, two students have completed the elective, and their feedback was exceedingly positive, and they have both made their application to EM residency. At present this elective is offered at two of our health systems locations, and as a future direction we hope to expand to all the campuses, offering the learners unique clinical experiences. We feel that this elective would be an important addition to other institutions and offers the learner an experience that is unique and different from a tradition EM rotation.

39 Integration of a Dedicated Education Rotation into an Emergency Medicine Residency

Wagner J, Bavolek R / Washington University School of Medicine, St. Louis, MO

Background: Traditional methods to create medical educators have fallen short. Educational theory is a growing field that is changing the landscape of medical education. Gone are the days of, "See one, do one, teach one."

Educational Objectives: All physicians need to be good educators. To this end we implemented a rotation exposing residents to the principles of effective adult education. We address areas of teaching and evaluation, creation of effective didactics, creation of "alternative education" (i.e. simulation and team based learning) curriculum, as well as clinical teaching skills.

Curricular Design: The rotation is led by faculty who are focused on education. Residents are given resources on effective slide design and presentation creation. Resident material is improved through a series of directed faculty sessions. Residents are filmed delivering lectures to perform self-assessment. The resident receives faculty and resident feedback from the talk to incorporate into the following week's lecture. They are also responsible for delivering medical student sessions raining from didactics to simulation. In the final week of the rotation, the resident crates either a simulation session or a team based learning session. Curricular style is modified to fit the education objectives and is guided and modified through faculty feedback. Finally, residents are exposed to bed-side teaching methods during shifts with a faculty member from the education team.

Impact: After the rotation residents are more effective educators and communicators. This is demonstrated in higher evaluations in lecture given after the education month. Review of reflective writing after the rotation reveals that residents find the experience invaluable. An unintended consequence of our curriculum is that it has raised the bar for educational delivery in our program. The residents now expect a higher level of excellence at conference from residents, guest lecturers, and faculty alike.

40 Integration of NB and Moodle to Create Online Literature Modules for Individual Interactive Instruction

Khadpe J, Willis J, Silverberg M, Smith T / SUNY Downstate Medical Center, Brooklyn, NY

Introduction: The Accreditation Council for Graduate Medical Education (ACGME) allows twenty percent of planned didactic experiences to be completed by Individual Interactive Instruction (III). There is a need to design activities that comply with the structural requirements of the ACGME and meet the educational goals of the program director (PD). We describe a web-based tool that reviews core Emergency Medicine (EM) literature in a forum that allows interaction with faculty and residents as well as evaluation of comprehension.

Objectives:

1. To describe the creation of online literature modules as part of an III curriculum.
2. Demonstrate compliance with ACGME requirements and Frequently Asked Questions (FAQ) for III activities.

Design: The ACGME FAQ for EM lists the required

components for III. Along with these requirements, our educational goals are to expose the residents to core curriculum EM journal articles. Online literature modules were developed that could be completed asynchronously and accessed using Moodle, a free learning management system. Subject matter is chosen within each module that links to NB, a collaborative annotative website that hosts the PDFs of the journal articles. Using NB, the residents can read, annotate and collaborate with each other and the supervising faculty. Once finished reviewing the articles, the resident then completes a quiz that serves to evaluate the resident's comprehension of the material. Participation is monitored through New Innovations, our institutional procedure-tracking software. Through this workflow, all required elements for an III activity are met while fulfilling our educational goals for the residents as well.

Impact: During the 2013-2014 academic year, 50 out of 85 residents chose to complete the online modules as part of their III curriculum for a total of 540 hours. The use of NB and Moodle allows for the creation of interactive learning that PDs can utilize in the development of a more robust III curriculum.

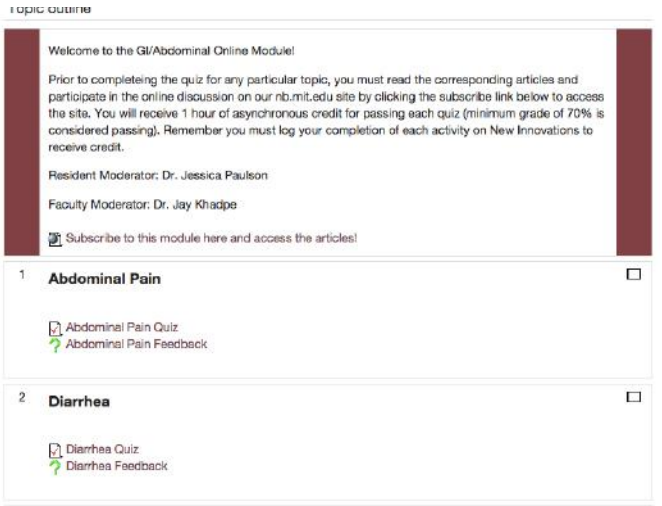


Figure 1.

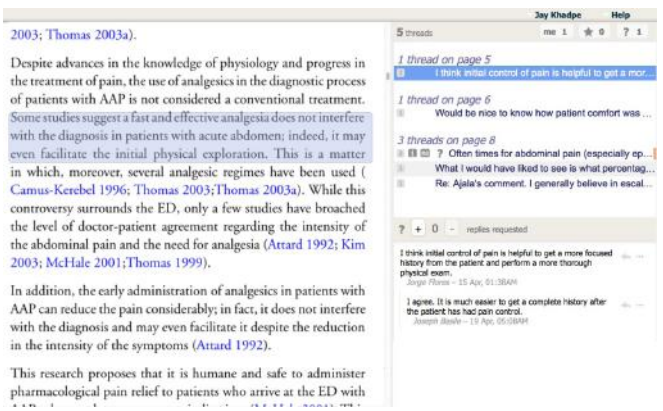


Figure 2.

41 Integration of Team-Based Learning (TBL) into a Residency Didactic Curriculum

Dora-Laskey A, Vance S / Central Michigan University, Saginaw, MI

Introduction/Background: Traditional lecture formats employed in educational conferences may not adequately ensure the degree of resident engagement necessary for mastery of emergency medicine core content. Team-based learning (TBL) strategies have been shown to improve knowledge acquisition and critical thinking skills among medical students, however their application to postgraduate medical education is not yet well defined.

Educational Objective: This curricular intervention was intended to improve resident participation and performance during textbook-based content review sessions, with the goal of increasing subject area expertise and improving future performance on summative assessments, including the American Board Emergency Medicine (ABEM) In-Training examination.

Curricular Design: TBL sessions are 90 minutes in length and scheduled monthly. Chapters from a major emergency medicine text organized by core content area are assigned in advance, and residents and faculty are oriented to the theory and mechanics of TBL prior to the first session. Teams are assigned randomly by post graduate year.

Residents begin each TBL session with an Individual Readiness Assessment Test (IRAT) composed of 10 board-style questions prepared by the faculty facilitator. During the Group Readiness Assessment Test (GRAT), teams take the same test collectively. Teams then have the opportunity to defend and debate their answers, then synthesize and apply this knowledge to higher-order case based questions (Application Exercise).

Challenges encountered include required faculty time to prepare the session materials, and the duration of conference time necessary to successfully complete each of the TBL elements.

Impact/Effectiveness: Impact of TBL curriculum is measured by quarterly resident feedback surveys. Results to date are summarized in Figure 1. Ongoing work will study educational effectiveness measured by resident trends on ABEM In-Service scores, board pass rates and clinical evaluations.

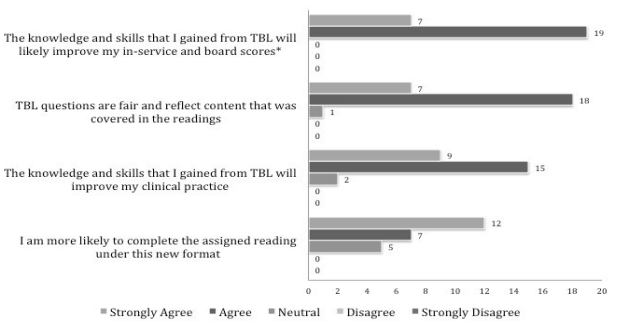


Figure 1. Team-based learning (TBL) resident feedback survey.

42 Isopropyl Alcohol Nasal Inhalation Intervention of Nausea in the Emergency Department: a Randomized Placebo-Controlled Human Trial

Beadle K, Helbling A, Love S, Hunter C / San Antonio Military Medical Center, San Antonio, TX

Objectives: To evaluate nausea and vomiting (NV) relief, pain relief, and satisfaction with treatment with nasally inhaled isopropyl alcohol (ISO) vs. saline placebo in emergency department (ED) patients before access to traditional antiemetics. We hypothesized all would be better in the ISO group.

Background: ISO has been shown to alleviate NV postoperatively. This study is the first to examine ISO for NV in the ED.

Methods: Randomized, prospective, blinded placebo-controlled trial in an urban military level-I trauma center ED. Subjects were blinded by masked substance packets and ignorance of the identities of the study substance and placebo. Investigators were blinded by masked packets and by distance from open packets. A convenience sample of 84 patients aged 18-65, able to breathe nasally, English literate, and complaining of NV was enrolled. Exclusions were pregnancy, ISO allergy, use of medications with antiemetic or disulfiram effect, recent upper respiratory infection, or clinical intoxication. Subjects described pain and nausea on an 11-point Verbal Numerical Response Score (VNRS) at 0, 2, 4, 6, and 10 minutes (min). At 0, 2, and 4 min subjects inhaled from the study packet for 60 seconds. A 3-point change on the VNRS was set as significantly different. Patient satisfaction was recorded on a 5-point Likert Scale at the study conclusion.

Results: 80 subjects completed the trial. 4 withdrew. None were excluded after enrollment. No adverse events were noted. 72.9% had significant nausea relief within 4 min of inhalation with ISO vs. 4.6% with placebo ($p<0.001$). 56% had nausea relief at 10 min with ISO vs. 2.3% with placebo ($p<0.002$). Pain relief was not different between groups ($p>0.05$). 64.8% were satisfied with ISO vs. 2.3% with placebo ($p<0.001$)

Conclusions: Nasally inhaled ISO is a safe and effective treatment for NV in the ED with relief onset by 4 min and persisting through the 10 min study duration.

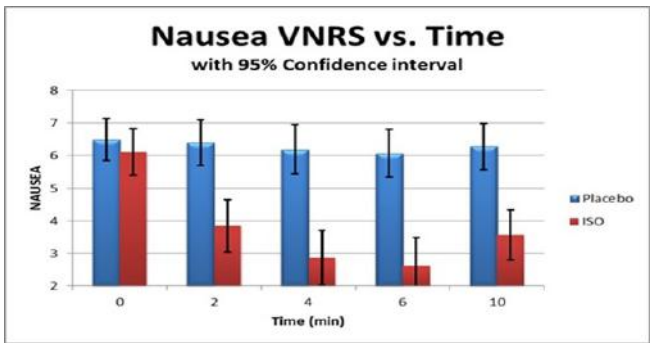


Figure 1.
VRNS, verbal numerical response score; *ISO*, isopropyl alcohol

43 Knife to the Chest: Development of a Realistic Emergency Thoracotomy Simulation Model

Byars D, Williams K, Clingenpeel J, Burhop J / Eastern Virginia Medical School, Norfolk, VA; Eastern Virginia Medical School and The Children's Hospital of the King's Daughters, Norfolk, VA

Introduction: Clinical encounters involving emergency thoracotomy after penetrating trauma are lifesaving interventions. Emergency medicine physicians must maintain expert proficiency at these critical procedures. Performing emergency thoracotomy remains rare, even among those working in trauma center settings. The infrequency of these critical procedure encounters, along with the importance of maintaining expert proficiency highlights the necessity of developing a realistic simulation model and scenarios and is paramount to procedure retention.

Objective: The objective was to design a medical simulation model that was life size, low cost, with realistic feel, rapidly replaceable parts and features to teach emergency thoracotomy in a safe and controlled education environment.

Design: The performance features of an adult head and thoracic simulation model were modified and retrofitted with flexible anatomic ribs, subcutaneous adipose, replaceable skin and swine heart with a knife through the left ventricle. The model was outfitted with low cost replaceable parts to create an accurate stepwise simulation. The emergency thoracotomy was described and demonstrated in small groups with 4 learners. Afterward, demonstration questions about the procedural steps and instruments were addressed. The model was refitted with new skin and adipose and the swine heart was suspended in a simulated pericardial membrane in fluid with a knife driven through the anterior chest and into the left ventricle. Each participant went through a hands-on simulation performing an emergency thoracotomy with cross-clamping of the aorta. Debriefing occurred after each simulation.

Impact: The emergency thoracotomy model provides a realistic simulator at a low cost with reusable components that enhance critical procedure training in a safe educational environment. The model enables educators to assess graduate medical education competencies including approach to therapeutic procedures through medical simulation.

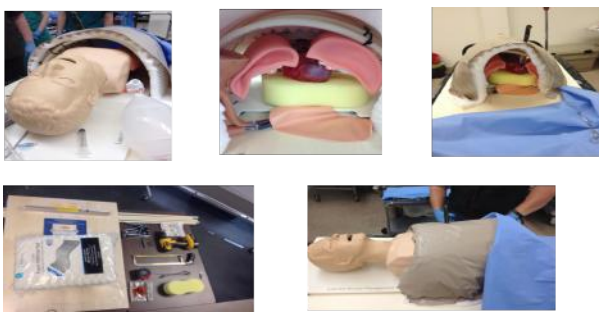


Figure 1.

Figure 2.

44 Low-Cost, Ultrasound-Compatible Paracentesis Model for Medical Trainees

Nelson A, Diller D, DeIorio N, Kim E / Oregon Health and Science University, Portland, OR

Introduction/Background: Paracentesis is an important procedure as physicians are poor predictors of spontaneous bacterial peritonitis. Simulation-based education has improved procedural skills training and decreased morbidity associated with invasive procedures. Deliberate practice with an ultrasound-compatible paracentesis simulator significantly improved resident procedural competence. Low-cost, ultrasound-compatible models for pericardiocentesis have been developed. We developed a low-cost, ultrasound-compatible model for medical trainees to perform paracenteses.

Objectives:

1. Review and model anatomic considerations when performing bedside paracentesis.
2. Develop a reproducible, ultrasound-compatible model that is efficient to use as an educational intervention.

Curricular Design: A prototype of our model was tested by medical students at Oregon Health and Science University under faculty supervision and all trainees obtained "peritoneal fluid." The model was then revised to make it ultrasound-compatible. We propose that this model be utilized in conjunction with additional education interventions including an online video paracentesis tutorial; an educational session reviewing indications for, benefits/risks of, and procedure set-up for paracentesis; and an outcome measurement of self-perceived competence and improved understanding of the tactile feedback necessary for this procedure.

Materials:

Whoopie cushion (12 pk $7)
Animal Twist and Shape Balloons (25/pk $2.50; 144/pk $10)
Vegetable oil ($1.50)
Sink
60mL syringe
Flesh-colored 9x11 sheets of felt ($0.99/sheet)
1-inch Binder Clip (24/pk $3)
12-inch basin (Medline $3)
Paracentesis kit (18 G needle, syringe)
Ultrasound

Impact: Simulation training can improve procedural skills and patient care. Prior non-commercial, paracentesis models are limited by their expense, time, faculty commitment and tool availability. Our simulator is low-cost, easy-to-assemble, ultrasound-compatible, and well-received by medical trainees.

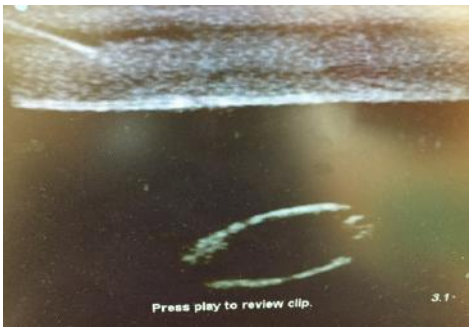


Figure 1.

Figure 2.

45 Mapping Emergency Medicine Milestones to an Existing Simulation Curriculum

Turner J, McIntosh B, Cooper D, Perkins A, Rodgers K / Indiana University, Indianapolis, IN; Integris Baptist Medical Center, Oklahoma City, OK; University of Arkansas, Tucson, AZ

Background: The Accreditation Council for Graduate Medical Education defines milestones that all residents are expected to meet. Program directors must develop methods to

evaluate resident milestones as they progress in their training. The unpredictable nature of clinical practice can create significant variability in patterns of skill use over short time periods necessitating other methods of evaluation. Simulation has been well accepted in emergency medicine (EM) resident education, but it is unknown to what extent milestones are represented in current simulation curricula.

Objectives: To determine how frequently an existing simulation curriculum incorporates each of the EM milestones.

Methods: The EM simulation curriculum at our institution was developed before milestone implementation and includes 63 unique cases. Each case was reviewed by one of the faculty members on the EM simulation committee. Reviewers determined whether the case incorporates each of the twenty-three EM milestones and the levels incorporated. An EM faculty member from outside the institution similarly reviewed each case. Inter-rater reliability was calculated as kappa.

Results: Twenty-two of the twenty-three EM milestones are incorporated in the simulation curriculum. Twenty-one are represented at more than one level. Individual milestones are incorporated in a mean of 44.7 and median of 59 cases over the three year curriculum. Overall inter-rater reliability was ?=0.791.

Conclusions: This simulation curriculum incorporates a majority of the emergency medicine milestones frequently and at multiple levels. Simulation has the potential to be a useful tool for evaluating EM residents with respect to the milestones as they progress through training. Existing resources may be able to provide a means to achieve assessment of milestones, precluding the need to spend time designing new methods of assessment. Other EM programs should assess their simulation curriculum as a potential method of tracking resident progress on milestones.

46 Measuring the Effects of Stress on Emergency Medicine Resident Performance of Critical Procedures Utilizing a Fresh Tissue Cadaver Lab

Tabatabai R, Plantmason L, Jhun P, Joseph D, Sullivan M, Minetti M, Cervantes A, Osterman J, Taira T, Shoenberger J / LAC+USC Medical Center, Los Angeles, CA; UC San Francisco, San Francsico, CA

Introduction/Background: Many emergency medicine (EM) residency programs use simulation for procedural training. However, there is less literature on the role of fresh tissue cadavers (FTC), which have higher fidelity than task simulators for performing procedures on patients. Moreover, studies show that increased stress and workload adversely affect fine motor function and can increase overall errors in task performance. By combining external stressors with invasive procedural practice on FTCs, we create a learning environment that most closely resembles clinical practice.

Educational Objective: We aim to provide procedural teaching for residents in an environment that most closely resembles a true EM resuscitation. We also aim to address the effects of external stressors on resident procedural performance and error rates.

Curricular Design: We run a fresh tissue cadaver lab twice monthly, with 4-6 resident participants per session. One faculty facilitator provides simulated clinical cases requiring critical procedures. Each resident is randomized to either non-stressful or stressful conditions (loud ambient noise, verbal pressure, monitors with alarms, and announcement of critical vital signs). Each session is video-recorded, and the faculty rates resident performance with a critical actions checklist and a validated assessment tool for clinical performance, the Ottawa Global Rating Scale. Time to procedural task completion is also recorded. Verbal debriefing and written surveys are completed post-simulation.

Impact/Effectiveness: Error is ubiquitous in medicine, particularly during critical events and resuscitation. By using a fresh tissue cadaver lab with external stressors, we provide the highest fidelity in simulating procedural training, to identify areas of improvement, with the ultimate goal of maximizing patient safety.

47 Medical Student Core Clinical Ultrasound Milestones: A Consensus Among Directors in the United States

Dinh V, Lakoff D, Hess J, Khandelwal S / Loma Linda School of Medicine, New York, NY; Icahn School of Medicine at Mount Sinai, New York, NY; University of Wisconsin School of Medicine and Public Health, Madison, WI; The Ohio State University Wexner Medical Center, Columbus, OH

Purpose: To formulate a consensus on core medical student clinical ultrasound milestones among ultrasound in medical education (USMED) directors across the United States.

Methods: An initial list of 204 potential clinical ultrasound milestones was developed through a literature review. An expert panel consisting of 34 USMED directors across the United States was used to produce consensus on clinical ultrasound milestones through two rounds of a modified Delphi technique.

Results: There was 100% response rate from the 34 USMED directors in both round 1 and round 2 of the modified Dephi protocol. After the first round, 205 milestones were revised to improve clarity and 9 milestones were added resulting in 214 milestones forwarded to round 2. After the second round, 90 milestones were found to have high level of agreement and were included in the final medical student core clinical ultrasound milestones.

Conclusions: The results of this study establish 90 core clinical milestones that all graduating medical students should obtain prior to graduation. These core milestones can serve as a guide for curriculum deans who are initiating ultrasound curricula at their institutions.

48 Medical Student, Senior Residents, and Unscheduled 72 Hour Return in the Emergency Department

Solano J, Chiu D, Ullman E, Fisher J / Beth Israel Deaconess Medical Center, Boston, MA

Background: An integral part of medical student education are sub-internship rotations where medical students take on the role of residents and assume the bulk of the patient contact, documentation, order entry and diagnostic test followup. This also plays an important role in evaluating prospective candidates to emergency medicine residency. This however should not come at the cost of patient safety.

Objectives: To determine if medical student care is associated with higher rate of unscheduled 72 hour return compared to senior resident physicians in the emergency department (ED).

Methods: This is a retrospective study from an urban academic tertiary care center with an EM residency with a primary outcome of unscheduled 72 hour return to an ED. The variable of interest is whether the primary provider was a medical student (MS) 4 or postgraduate year-3 (PGY). All Patients presenting to the ED between 07/01/2010 to 06/30/2013 were eligible. Those who were not formally discharged (e.g. admission, AMA, eloped etc.) or told to return were excluded. Logistic regression was used to test for significance and to control for confounders such as age and sex. Odds ratios (OR) with 95% confidence interval (CI) were used as the primary effect estimate.

Results: We collected a total of 93834 patients. Of these 5099 (5.4%) returned to the ED within 72 hrs. The OR of a MS4 with a 72 hour return is 1.01 with a 95% CI (0.84-1.22), and for PGY3s, it is 0.87 with a 95% CI (0.78-0.97). PGY3 was statistically significant (p=0.01). Age and gender were also significant with a p-value of <0.01. However MS4s and ESI were not significant (p=0.92 and p=0.41, respectively).

Conclusions: While it appears that MS4s have a stronger association with unscheduled 72 hr return compared to PGY3s, the 95% CIs of these covariates overlap indicating that this difference is not significant. It appears that medical student sub-internships in the ED with attending supervision are safe, using unscheduled 72 hr return as a proxy for patient safety.

49 Novel Cardiovascular Emergency Rotation for First Year Emergency Medicine Residents

Barnwell R, Angelidis A / San Antonio Military Medical Center, San Antonio, TX

Introduction: The ability to recognize and treat cardiovascular (CV) emergencies is an essential aspect of emergency medicine (EM) education. There is an educational need to standardize these concepts in a meaningful way early in an EM residents training. Leaving this large topic to spontaneous exposure during residency may lead to an undesirable knowledge gap.

Educational objectives:

- Hone clinical skills regarding the direct care of patients with acute cardiac emergencies
- Become skilled in exercise stress testing protocols and interpretation
- Receive exposure to advanced imaging protocols and interpretation
- Gain experience in basic echocardiography for the diagnosis of CV emergencies
- Become proficient in procedures germane to cardiovascular emergencies
- Read and interpret landmark articles useful for clinical practice
- Receive formalized electrocardiography (ECG) interpretation training

Curricular Design: Our 1 month CV emergencies rotation is designed for first year residents. Interns work two 8-hour emergency department shifts and four 8-hour days per week in the Cardiology department rotating on the different subspecialties. Students attend daily Cardiology conference. Weekly assignments are accessed through an online compendium. Assignments are made up of text, journals, cases, social media and computer based ECG course. Pre/post-tests are administered. Course director fills out final evaluations.

Impact/Effectiveness: This type of novel curriculum enhances learning in multiple ways. The curriculum is standardized for every intern. The online compendium has the benefit of asynchronous learning and completion tracked by the course director. The curriculum embraces active learning and exposes the student to a wider scope of CV concepts in a shorter period of time without excessive service tasks. Appendix A shows marked improvement in post-test scores (23% increase). By having first year residents complete this rotation; we can effectively establish a strong foundation early in their training.

Table 1. Appendix A.

Learner	Pre-test(%)	Post-test(%)	Change(%)
1	67	77	10
2	72	90	18
3	49	91	42
4	87	95	8
5	50	87	37
Average	65	88	23

50 Novel Use of Hybrid Simulation for Resident Education and Experience in Death Notification

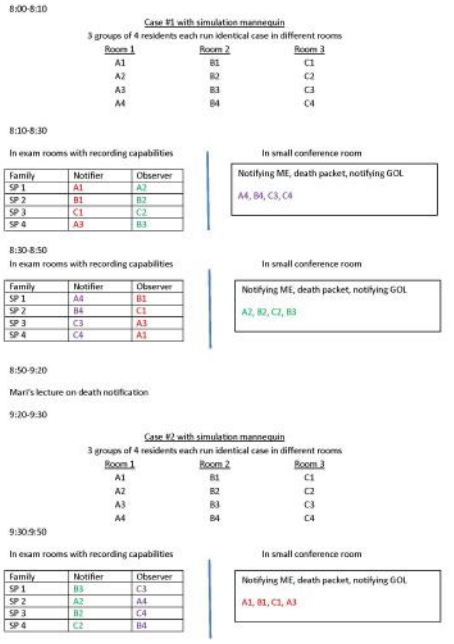
Naples R, Repanshek Z, Fisher J, Siegel M, Wald D / Temple University, Phildelphia, PA

Background: There have been several models developed using actors for resident education and experience in death notification. None have used simulated patient death or inclusion of necessary paper work.

Education Objectives: We sought to develop a hybrid simulation case to engage and educate our residents and create a high yield experience in death notification using mannequins, actors, death packet completion, small group lecture and peer observation/feedback.

Curricular Design: Residents were divided into 3 groups, each consisting of 4 residents of mixed postgraduate year level. Each group participated in an identical mannequin based simulation which ended in the "patient's" death. Groups were then separated and rotated through 2 of 3 stations: complete the death packet, inform the "patient's" family member (played by an actor) of the death or observe a fellow resident perform death notification. All residents then participated in a small group lecture on death notification. Residents then returned to original groups and participated in another simulated mannequin scenario which ended the patient expiring. The residents were separated to complete the 3rd station that (s)he did not previous complete.

Effectiveness: Residents were surveyed pre-sim (35/36), immediately post-sim (25/25) and 4 months later (25/25). Residents uniformly agreed that their comfort with performing death notification improved after the hybrid simulation. 17/25(68%) residents performed death notification after participation in the simulation. 17/17(100%) stated that they incorporated techniques from simulation into the death notification. 16/17(94%) rated the overall experience fairly/very beneficial in terms of communicating with family. Prior to the simulation experience, residents overall rated that they "sometimes" had death packets returned with errors. After the simulation, in the residents who had completed death certificates, they reported that they were "rarely" returned.


8:00-8:10

Case #1 with simulation mannequin

3 groups of 4 residents each run identical case in different rooms

Room 1	Room 2	Room 3
A1	B1	C1
A2	B2	C2
A3	B3	C3
A4	B4	C4

8:10-8:30

In exam rooms with recording capabilities

Family	Notifier	Observer
SP 1	A1	A2
SP 2	B1	B2
SP 3	C1	C2
SP 4	A3	B3

In small conference room

Notifying ME, death packet, notifying GOL

A4, B4, C3, C4

8:30-8:50

In exam rooms with recording capabilities

Family	Notifier	Observer
SP 1	A4	B1
SP 2	B4	C1
SP 3	C3	A3
SP 4	C4	A1

In small conference room

Notifying ME, death packet, notifying GOL

A2, B2, C2, B3

8:50-9:20

Mari's lecture on death notification

9:20-9:30

Case #2 with simulation mannequin

3 groups of 4 residents each run identical case in different rooms

Room 1	Room 2	Room 3
A1	B1	C1
A2	B2	C2
A3	B3	C3
A4	B4	C4

9:30-9:50

In exam rooms with recording capabilities

Family	Notifier	Observer
SP 1	B3	C3
SP 2	A2	A4
SP 3	B2	C4
SP 4	C2	B4

In small conference room

Notifying ME, death packet, notifying GOL

A1, B1, C1, A3

Figure 1.

51 Open Access Resident-Driven Education Resource for New Resident Teachers

Schneberk T, Montano M, Eads A, Plantmason L, Wagner J / LAC+USC Medical Center, Los Angeles, CA

Introduction: As residency training progresses, the role of the senior resident transitions to include teaching of the junior residents. Despite an abundance of educational learning resources, there exists a dearth of teaching tools for the novice resident instructor. Implementation of a standardized resource for the beginning resident-teacher could bridge that gap as well as aid senior residents in solidifying core concepts while providing exposure to clinical teaching and educational development.

Educational Objectives: Develop an accessible, concise and practical teaching adjunct to deliver medical education appropriate to the intern and medical student level to encourage and facilitate senior to junior resident teaching during a busy clinical shift.

Curricular Design: Fourteen 5-minute slideshow lectures covering relevant clinical topics (e.g. congestive heart failure exacerbation, acute asthma, sepsis) were created in a format accessible to all resident teachers with the intention to assist in delivering concise, standardized and organized educational material at the bedside. Lectures were stored on an accessible residency education website and Google Drive and shared among the new postgraduate year-3 (PGY-3) class as they began working with interns and students. Residents in that class were also encouraged to develop and contribute presentations to the lecture-bank.

Effectiveness: All 17 residents in the postgraduate year 3 class were surveyed at 5 months to evaluate the impact of the program. Strengths as well as difficulties in design were found. A significant barrier was poor use among the class, to which a majority of residents recommended more reminders of resource availability. Among the residents that used the lectures most found they improved knowledge (67%), encouraged teaching (67%), were well received by learners (80%) and made teaching more comfortable (80%). The initiative needed improvement in design and access, but it succeeded in motivating residents to teach more frequently (88%).

52 OPERATION DON'T SMOKE: Training Pre-Clinical Medical Students to Counsel Patients in the Emergency Department

Kuhn G, Courage C, Hill-Rice V / Wayne State University Detroit Medical Center, Detroit, MI

Introduction/Background: Use of tobacco products is the most common cause of preventable death globally. Giving first-year medical students opportunities for clinical experiences has been shown to be highly effective and results in long-term retention of knowledge and skills.

Educational Objectives: We report a curriculum designed to provide first and second-year medical students didactic and experiential learning counseling patients on smoking cessation in the emergency department (ED) setting.

Curricular Design: A needs assessment was performed via a literature search and discussion with a group of medical students. The curriculum contained three elements: a two hour lecture providing students with knowledge about the burden of disease, diseases associated with smoking, pharmacotherapy aids for quitting smoking, and counseling patients using the "Five As" recommended by the Agency for Healthcare Research and Quality (AHRQ). Former smokers discussed quitting difficulties and answered questions. An orientation included a tour of the ED, Health Insurance Portabliity and Accountability Act training, and discussion of professionalism. The authors modeled patient counseling and use of AHRQ booklets. Guided practice was provided until students were comfortable counseling patients. Continued mentorship and guidance were provided via e-mail and meetings on an as-needed basis. All students were contacted after their first independent counseling session to identify problems, need for additional information, number of patients counseled, and impressions of learning.

Impact/Effectiveness: This model curriculum requires minimal supervision after initial training, is generalizable, and provides medical students with both didactic information and experiential learning. Student feedback resulted in program modifications.

Table 1. OPERATION DON'T SMOKE: Cumulative results (2009-2013).

	N
Number of student volunteers	154
Total number of patients counseled	471
Hours volunteered by students	
Total	706
Mean(SD)	6(1.4)
Median	6
Range	1-44

Table 2. Themes in student feedback (n=42).

	N
Enjoyment/enthusiasm/support for project	29(69.0%)
Surprise at patients' openness/receptiveness to quitting	19(45.2%)
Acknowledged clinical/career relevance	16(38.1%)
Felt the need to provide patients with more information	13(31.0%)
Suggested different methods of getting message across to patients	10(23.8%)
Felt students needed more guidance/ assistance/information	9(21.4%)
Students felt they made a lasting impact on patients' health	8(19.0%)
Difficulty or concerns	5(11.9%)
Felt preparatory materials/lecture were effective	4(9.5%)
Other suggestions provided	4(9.5%)

53 Patient Perceptions of Medical Provider Communication Skills as Influenced by Openness and Personal Characteristics

Burkhardt J, Perry M, Zink K, London K, Floto O, Santen S / University of Michigan, Ann Arbor, MI

Background: Communication is a key ability for medical professionals and previous research has demonstrated that patient characteristics may play a role in the successful establishment of the provider/patient relationship.

Objectives: Patient and physician personal characteristics, including openness on the part of the provider about their own lives, have an important role in establishing effective communication in the clinical setting and shape patient perception of this interaction.

Methods: Emergency medicine provider/patient interactions were observed in an academic setting. Surveys were distributed regarding perceived provider communication ability and demographic information. A multinomial logistic regression was estimated with outcomes of below average to average (1-3), good (4), and very good (5) communications scores. Independent variables were patient age, race and ethnicity, patient gender, patient education, patient pain score, provider role, and whether the provider talked about themselves. This study received institutional review board approval.

Results: The multinomial logistic regression was statistically significant at the $p<0.01$ level. Patient age, patient gender, mid-level providers, and whether the provider talked about themselves were all significantly correlated with provider communication scores (Table 1). Providers who talked about themselves were 4.79 (95% CI:[0.29, 2.84]) times more likely to score very good (5) than below average to average (1-3) on patient perception of communication. Similarly, Mid-level Providers (Residents and Physician Assistants) compared with Faculty were 3.79 (95% CI:[0.22, 2.45]) times more likely to score very good (5) than below average to average (1-3) on the same scale.

Conclusions: Providers who talked about themselves and were in a mid-level provider role were correlated with

Table 1. Multinomial logistic model.

	Good (4)			Very good (5)		
	Log coefficient	Relative risk ratio	Confidence level	Logit coefficient	Relative risk ratio	Confidence level
Patient age	0.02*(0.01)	1.023* (0.01)	-0.00,0.05	0.03*** (0.01)	1.03*** (0.01)	0.01,0.06
URM	-0.08 (0.46)	0.92 (0.42)	-0.98, (0.82)	0.40 (0.45)	1.49 (0.67)	-0.48, 1.28
Female	-1.35*** (0.46)	0.26*** (0.12)	-2.26,-0.44	-1.53*** (0.46)	0.22*** (0.10)	-2.44,-0.63
Above college degree	-0.18 (0.56)	0.84 (0.47)	-1.27, 0.91	-0.52 (0.56)	0.60(0.33)	-1.61, 0.57
Bachelor's degree	-0.06 (0.53)	0.94 (0.50)	-1.11, 0.98	-0.84 (0.53)	0.92 (0.49)	-1.12, 0.96
Some college	0.45 (0.49)	1.57 (0.76)	-0.51, 1.40	0.17 (0.49)	1.18 (0.58)	-0.79, 1.13
Pain score	0.04 (0.06)	1.04 (0.07)	-0.09, 0.16	0.01 (0.06)	1.01 (0.06)	-0.12, 0.13
Residents and PA's	1.05* (0.57)	2.85 (1.63)	-0.08, 2.17	1.33** (0.57)	3.79**(2.16)	0.22, 2.45
"Not sure" if talked about self	1.45 (1.07)	4.26 (4.55)	-0.64, 3.54	1.99*(1.06)	7.28* (7.69)	-0.08, 4.06
"Yes" talked about self	0.93 (0.66)	2.53 (1.67)	-0.37, 2.23	1.57** (0.65)	4.79** (3.11)	0.29, 2.84
Constant	0.87*(0.72)			0.70(0.71)		

higher communication scores. Patient gender and age, but not minority status, were significant predictors of perceived communication ability of providers.

54 Protecting Faculty Time for Direct Observation Shifts in a Large Emergency Medicine Residency Program

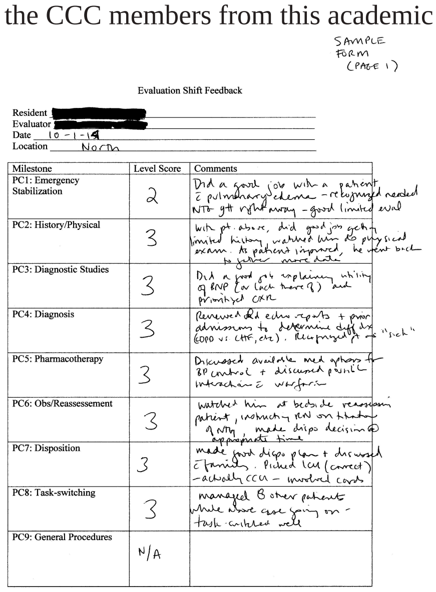
Shoenberger J, Taira T, Tabatabai R, Osterman J / Keck School of Medicine of USC, Los Angeles, CA

Introduction: Direct observation is listed as a suggested evaluation method for 22 of the 23 emergency medicine (EM) milestones. The challenge for the faculty evaluator when attempting to perform direct observation during a clinical shift is doing so in a chaotic environment with many interruptions and other expectations. Many departments have considered protecting faculty time to engage in direct observation but have struggled with the potential cost without clear benefit.

Educational Objective: To implement a program to protect faculty time to perform direct observation and give high quality feedback to residents.

Design: In July 2013, the program started at a large single-site EM residency. Two to three 8-hour shifts per week were added to the clinical schedule as "observation shifts". Only core faculty are eligible to participate and participation is voluntary. These shifts are counted as part of the faculty member's clinical shift count. During the observation shift, faculty are assigned minimal clinical duties as the emphasis is on direct resident observation. On average, faculty evaluate 3-4 residents per shift. To prevent duplication, each faculty member is given a summary sheet listing residents still in need of observation and which milestones need to be observed. After performing dedicated direct observations, faculty members spend time giving residents high quality, real time feedback. They are also able to simultaneously educate the residents on the EM milestones. The observation forms are used during Clinical Competency Committees (CCC) evaluations.

Impact: Residents had the opportunity to evaluate the new observation shift on the end-of-year program evaluation form in June 2014 and the comments were >90% positive. Residents responded most positively to the feedback portion of the shift. Of the CCC members from this academic year


SAMPLE FORM (PAGE 1)

Evaluation Shift Feedback

Resident [redacted]
Evaluator [redacted]
Date 10-1-14
Location North

Milestone	Level Score	Comments
PC1: Emergency Stabilization	2	Did a good job with a patient c̄ pulmonary edema – recognized needed NTG gtt right away – good limited eval
PC2: History/Physical	3	With pt. above, did good job getting limited history, watched him do physical exam. As patient improved, he went back to gather more data
PC3: Diagnostic Studies	3	Did a good job explaining utility of BNP (or lack there of) and prioritized CXR
PC4: Diagnosis	3	Reviewed old echo reports + prior admissions to determine diff dx (COPD vs. CHF, etc). Recognized pt as "sick"
PC5: Pharmacotherapy	3	Discussed available med options for BP control + discussed possible interaction c̄ warfarin
PC6: Obs/Reassessement	3	Watched him at bedside reassessing patient, instructing RN on titration of NTG, made dispo decision @ appropriate time
PC7: Disposition	3	made good dispo plan + discussed c̄ family. Picked ICU (correct) – actually CCU – involved cards
PC8: Task-switching	3	managed [illegible] other patients while above case going on – task-switched well
PC9: General Procedures	N/A	

Figure 1.

and the previous year, 100% commented that these direct observation evaluation forms were the most valuable piece of data in the resident portfolio.

55 Reclaiming the Lost: Improving Off-Service Evaluation of Emergency Medicine Residents

McDowell C, Waymack II J / Southern Illinois University School of Medicine, Springfield, IL

Introduction: Emergency Medicine (EM) residents spend multiple months of their clinical education with services outside of the Emergency Department (ED). Evaluation data from these off-service rotations may not provide the EM residency information pertinent to EM resident advancement. Off-service evaluations rarely reflect the new EM milestones.

Objective: Our goal was to develop EM milestone-based evaluations for medical intensive care unit (ICU), trauma and anesthesia rotations.

Curricular Design: The EM Milestones project was reviewed and milestones incorporated in the following tools. An airway card was developed based upon subcompetency PC10, Airway Management. This evaluation tool can be completed by the anesthesia attending after each airway procedure. The trauma service and medical ICU evaluation tools incorporate the milestones pertinent to the evaluation of an EM resident in these settings (Subcompetencies PC1, PC2, PC3, PC4, PC5, PC9, PC10, PC11, PC12, PC13, PC14, PROF1, ICS1 andICS2.) These evaluations can be given to each attending that had adequate exposure to the EM resident. Each tool provides areas for comments and further feedback.

Impact/Effectiveness: We have developed milestone-based evaluation tools for off-service EM resident rotations in the Medical ICU, Trauma, and Anesthesia settings. These tools will allow programs to integrate off-service feedback more readily into milestone assessments. Delivery of feedback in a similar format to other aspects of residency training may increase the utility to the resident. Revision of these evaluation tools may spur increased off-service faculty engagement in providing resident feedback.

56 Residency Applicants Do Not Comply with CORD Bibliography Citation Guidelines

Ramoska E, Nocera R, Levine B / Drexel University College of Medicine, Philadelphia, PA; Christiana Health Care System, Wilmington, DE

Introduction/Background: Prior research has shown that applicants to residency programs sometimes misrepresent their research publications, either accidently or intentionally. Council of Emergency Medicine Residency Directors (CORD) has developed a guideline to assist medical students who are applying to emergency medicine (EM) residency programs in citing their publications. This information is publicly available.

Objectives: This study seeks to quantify the number of residency applicants who comply with these guidelines. It is hypothesized that compliance with these guidelines will be small and that those provided with a copy of the guidelines will have a higher rate of compliance.

Methods: This prospective, multi-institutional study included applicants invited to interview for the 2014 Match at 2 institutions. Subjects' application packages were reviewed in the customary fashion at each institution. Those applicants with an odd Association of American Medical Colleges (AAMC) number (Group 1) were invited for an interview without any mention of the CORD guidelines. Those with an even AAMC number (Group 2) were sent a copy of the CORD Bibliographic Citation Guidelines with their invitation to interview. To avoid unintended bias, an independent researcher, who was completely uninvolved in selecting applicants for the program, obtained a copy of the program's rank order list and eliminated subjects who had matched at that institution. The researcher then matched the documents with the subject's Electronic Residency Application Service application and determined whether the subject supplied any of the requested documents.

Results: 323 applicants were interviewed at 2 sites. 175 of them (54%) had publications. 7 of 89 (8%) who had publications and were reminded of the CORD guidelines complied with them. Only 1 of 86 (1%) with publications but no reminder complied. This result is significant using a one-tailed Fisher's exact test ($p=0.04$).

Conclusions: Applicants are not complying with the CORD Bibliographic citation guidelines even when they are reminded about them.

57 Residency Rank List: Does Prior Global Health Exposure Affect the Match?

Wayman B, Rodgers J, Noot V, Irvine S / University of Alabama-Birmingham, Birmingham, AL

Background: Recent trends suggest growing interest in Global Health (GH) among Emergency Medicine (EM) physicians. Exposure to GH training and service opportunities are increasingly important to EM residents and applicants.

Objectives: We surveyed applicants, residents, and graduates of the University of Alabama-Birmingham (UAB) EM residency program to examine GH interest, prior GH exposure, and impact of GH training opportunities on residency program ranking. We hypothesized that GH interest and prior GH exposure affect how prospective residents rank residency programs.

Methods: This observational survey research study prospectively recruited current and former UAB EM residents and residency program applicants to complete a six-item Web-based questionnaire between November 2013 and February 2014. Survey responses were stratified by residency

status (graduate, resident, or applicant) and cross-tabulated to evaluate group interest in GH topics, prior GH exposure, and impact of GH training opportunities on program ranking. Frequency and chi square statistics were calculated using Stata v.13.1 (Stata, Inc., College Station, Texas); α=0.05 was considered statistically significant.

Results: Of the 180 individuals recruited for study participation, 147 (81.7%) voluntarily completed our questionnaire, including 34 (23.1%) graduates, 37 (25.2%) residents, and 76 (51.7%) applicants. An overwhelming majority (88.5%) expressed interest in GH topics and most (77.5%) reported that didactic GH training would improve the overall EM residency experience. Participants with prior GH exposure and participants that expressed interest in GH were more likely to rank EM residency programs with GH training opportunities higher than programs without GH training opportunities (χ2=27.0, p<0.001; χ2=12.3, p=0.002).

Conclusion: Findings support trends indicating growing interest in Global Health among EM physicians. Global Health interest and prior Global Health exposure significantly impact EM residency program ranking.

58 Resident Participation in Fresh-Tissue Lab Increases Confidence and Retention of Procedural and Anatomical Knowledge

Cunningham T, Huecker M, Harris Z / University of Louisville, Louisville, KY

Introduction / Background: Duty hour restrictions and patient safety concerns have altered resident procedural instruction. Simulation models have largely replaced cadaver-based training. Residents receive little formal procedural instruction on realistic human models. The American College of Surgeons has addressed this by offering the ASSET cadaver course. Emergency medicine offers no such standardized curriculum.

Educational Objectives: We implemented a module of procedural instruction in a fresh-tissue cadaver lab. We expected the residents to gain and retain procedural knowledge, translating to improved confidence and operational skills.

Curricular Design: All residents first completed a survey and multiple-choice test. Videos and a PowerPoint presentation were then distributed.

Emergency medicine (EM)1 residents participated in the fresh-tissue lab while the EM2 residents did not. Lab sessions had a 3:1 resident to faculty ratio. Multiple procedures were performed, along with dissection and anatomy review. Lab participants completed a survey on the value of the session.

Three months later, all residents completed the original test. Six months later, all residents completed the original survey.

Impact / Effectiveness: This "innovation" is a return to an established but deemphasized teaching method. Lab participation improved confidence in performing and teaching procedures. Survey data indicate a preference for the fresh-tissue method compared to simulation. Residents desire more formal instruction in procedures and anatomy.

The initial mean test score in the EM1s was lower than EM2s. Three months later, the mean score of the EM1s was higher than the EM2s, reaching statistical significance. This indicates an improved retention of knowledge due to our educational innovation. Interestingly, residents did not realize our effort to dispel the questioned dogma of "see one, do one, teach one "

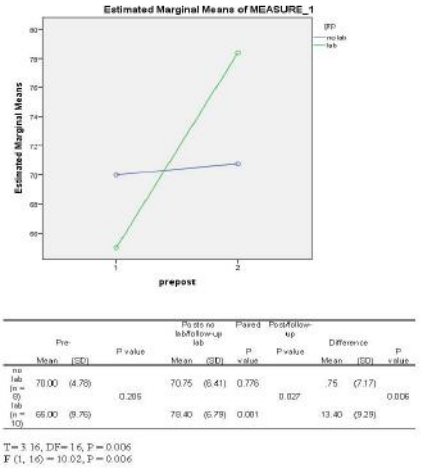


Figure 1.

59 Resident Performance and Charting of Key Elements of the History and Physical Exam

Naples R, Repanshek Z, Fisher J / Temple University, Philadelphia, PA

Background: Emergency Medicine (EM) residents are infrequently directly observed during patient care in the emergency department (ED). Consequently, presentation and charting cannot be easily monitored for accuracy.

Objective: We sought to determine if EM residents obtain appropriate history and physical (H&P) exams and chart accordingly on a common ED complaint.

Methods: Using 5 standardized patients (SPs) trained on an asthma case, EM residents at our 3 year urban academic program were asked to perform an H&P, reassessments and charting using a test version of our electronic medical record. Using real time SP reporting and attending physician observation, data was collected on performance of key elements of the asthma H&P and reconciled with the chart. Key elements were based on establish departmental consensus.

Results: 24 of 36 (67%) of residents participated (postgraduate year-1 (PGY-1) n= 9, PGY2 n=7, PGY3 n=8). One encounter involved 2 residents resulting in 23 total SP encounters. Historical data obtained from SP's include: asthma exacerbation triggers-13/23 (57%), history of intubation-19/23(83%), current smoking-6/23 (26%), last ED visit-13/23 (57%), recent steroid use-16/23 (70%), current

medication regimen-17/23 (74%). Physical exam maneuvers performed on the SP's included: cardiac exam "18/23 (78%), pulmonary exam "23/23 (100%), deep vein thrombosis (DVT) exam-10/23 (44%), pulse exam "5/23 (22%). 13/23 (57%) residents documented a DVT exam and 15/23 (65%) residents documents a pulse exam/no pulse deficit.

Conclusions: Based on the assessment of a common ED complaint, residents frequently did not perform all key elements of the H&P. It appears a number of residents documented elements of the physical exam that they did not perform. A limitation of the study is that it is possible residents may have not felt it appropriate to perform all facets of the physical exam on a SP but instead documented what they would normally do. Continuing education should focus on teaching key elements of H&P and appropriate documentation.

60 Resident-Based Preceptorship Improves Student Clinical Skills in the Emergency Department

Ruest A, Smith C, Gagdil R, Tang A, Moradian N, Sokolovsky S, Ashfaq S, Montalvo E, Aghera A, Schiller J / Maimonides Medical Center, Brooklyn, NY

Background: Resident as Teacher (RaT) programs have been shown to improve resident knowledge, skills, and attitudes towards teaching. However, little study has been devoted to the effect on student learning outcomes.

Objectives: To assess the effect of a RaT curriculum on clinical skill performance of medical students in an emergency medicine clerkship.

Methods: This prospective, randomized study performed at an urban community academic hospital investigated the effects of an RaT program on the clinical performance of 4th-year medical students in a 4-week clerkship. Students were randomized into two groups. In week 2, Group One (N=30) received an 8-hour shift devoted to one-to-one precepting by a senior resident without other clinical responsibilities. Group Two (N=25) was precepted in week 4. Both groups were given a standardized simulated encounter in weeks 1 and 3 - before and after Group One's precepted session. Two trained raters independently scored each student's performance on a Likert scale of 0 to 5. Groups One and Two were compared by observing improvement of student performance in 5 clinical skill categories. A p-value <0.10 was considered statistically significant based on previous educational research.

Results: Median difference of performance for Groups One and Two were, respectively: data gathering 1.00 (Range: -0.50 to 2.50) vs. 0.50 (Range: -1.00 to 2.50) (p=0.057); emergency management 1.00 (Range: -0.50 to 3.50) vs. 0.50 (Range: -2.00 to 2.50) (p=0.026); professionalism 1.00 (Range: -1.00 to 3.00) vs. 0.50 (Range: -1.00 to 2.50) (p=0.424); communication 1.00 (Range: -1.00 to 3.00) vs. 0.50 (Range: -1.00 to 1.50) (p=0.123); medical knowledge 1.00 (Range: -1.00 to 3.00) vs. 1.00 (Range: -1.50 to 3.50) (p=0.635); and total score 6.75 (Range: -2.00 to 11.50) vs. 4.50 (Range: -4.00 to 11.00) (p=0.018).

Conclusion: The RaT preceptor program helps improve student performance of data gathering, emergency management and total clinical score in a standardized patient setting.

61 Resident-Driven Ultrasound-Guided Peripheral Intraveous (USGPIV) Nursing Education Program Reduces Attempts and Time to IV Access

Forster-Hill M, Young J, Salyers T / Virginia Tech-Carilion, Roanoke, VA

Background: Obtaining peripheral intravenous (PIV) access in the emergency department (ED) can be difficult for nurses. A resident-driven ultrasound- guided peripheral intravenous (USGPIV) access nursing training program was initiated as an interprofessional quality project.

Objective: To compare venous access times in difficult-to-access patients requiring more than 2 attempts using the traditional manner against those in whom USGPIV placement was utilized. Secondary outcomes were to identify specific patient criteria that may predict difficult intravenous access.

Method: Nurses were trained with a 2 hour course and 20 successful USGPIV cannulations. ED patients were defined as "difficult access" after 2 traditional PIV attempts by one nurse were unsuccessful. Cohort 1 consisted of all patient encounters with >2 access attempts by the traditional technique. Cohort 2 consisted of all patient encounters when USGPIV was employed after 2 unsuccessful attempts. Cohort data included the recorded time, number of attempts, and barriers to successful cannulation recorded in the electronic medical record (EMR.) Data from the EMR was retrospectively analyzed to determine which characteristics were most frequently encountered when a nurse was unable to place PIV access. Results: Successful cannulation attempts differed between blind and ultrasound guided technique (3.75 vs. 1.16.) USGPIV was 2.7 times faster (19.7 min vs. 8.36 min) than traditional access placement. Characteristics most commonly recorded for difficult access included chronic illnesses, cannot adequately visualize, and skin color (33%; 71%, 15% respectively).

Conclusion: A resident-driven nursing USGPIV training program decreased the delay and number of attempts to establish PIV access in difficult access patients. Particular characteristics are more prevalent when encountering difficult access, but further study to prospectively evaluate predictive value is required.

62 Senior Medical Students Perception of the Final Year of Medical School, the Impact of Faculty Advice

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Background: Because the curriculum of the final year of medical school (FYMS) is not standardized student experiences vary.

Objective: We sought to identify the perceptions that senior medical students (SMS) have regarding the FYMS and the impact that faculty advice has on these perceptions.

Methods: The authors administered a survey to 349 SMS at 5 U.S. medical schools in the spring of 2014. Associations were evaluated using Chi-square method.

Results: Surveys were completed by 293 (84%) SMS with a median age (range) of 27 (24-39) years, 54% males. 220/292 (75%) reported receiving advice from a faculty advisor when planning their FYMS, 164/216 (76%) rated the advice as good/excellent and no significant differences were noted regarding student gender in receiving advice or rating of the advice. SMS who received advice regarding scheduling their rotations were more likely to be fairly/very satisfied with their FYMS training compared to SMS who did not receive advice (79% vs. 61%, OR=2.41, p=0.002). SMS receiving advice were more likely to report that timing of residency interviews influenced the scheduling of their rotations (89% vs. 79%, OR=2.15, p=0.03). SMS who received advice as compared to those who did not were more likely to rate the following factors as fairly/very important when selecting an elective rotation in the FYMS: a showcase or audition elective (67% vs. 51%, OR=1.97, p=0.015), to strengthen their residency application (63% vs. 43%, OR=2.26, p=0.003), to obtain a recommendation (77% vs. 62%, OR=2.04, p=0.015), and to better prepare for residency (80% vs. 61%, OR=2.62, p=0.001).

Conclusion: Most SMS reported receiving faculty advice regarding the scheduling of their final year rotations, and most rated the advice they received highly. SMS who received faculty advice reported greater satisfaction with the training they are receiving in the FYMS. Faculty advice may play a big role in the perceived importance for selecting elective rotations in the FYMS.

63 So Your Program is on Twitter, Now What? A Needs Assessment on the Use of Twitter and Free Open Access Medical Education in an Emergency Medicine Residency Program

Devine B, Dyer S, Bowman S, Nordquist E, Mycyk M / John H. Stroger Jr. Hospital of Cook County, Chicago, IL

Introduction: Twitter has quickly become a widely used platform in the Free Open Access Medical Education (FOAM) movement. Barriers to integrating Twitter and other FOAM resources into residency curricula have not been fully described.

Objective: To identify the need and barriers for the use of Twitter and FOAM as part of an emergency medicine (EM) residency curriculum.

Methods: A working group of experts developed a needs assessment survey using closed-format questions with multiple choice and binary responses. It was piloted for study performance, revised, and distributed in a single large EM program with responses being anonymous and voluntary. Descriptive analysis was done.

Results: Response rate was 75%: 55 residents, 1 fellow, and 20 faculty. Sixty-nine percent of respondents use FOAM monthly. Only 28% (21/76) use Twitter, of which 76% (16/21) for medical education. While 41% (31/76) do not believe a program Twitter account would be helpful, 93% (69/74) agree that FOAM resources should be included in the residency curriculum. Barriers to using Twitter for medical education are lack of peer review (39%) and lack of organization (38%). Among traditional educational modalities such as textbooks and peer-reviewed journals, FOAM is considered the second easiest to use, but the least authoritative.

Conclusion: The majority of respondents use FOAM, although a minority use Twitter. Almost all participants want FOAM resources incorporated into the curriculum, however far less believe a residency twitter account would be valuable. Therefore, Twitter may not be the ideal way to incorporate FOAM into a residency. Further studies should investigate how to best integrate FOAM into a residency curriculum.

64 Students' Comfort in Being a First Responder and their Ability to Self-Assess their Performance as a First-Responder on Objective Structured Clinical Examinations (OSCEs)

Ghory H, Mahfoud Z, Sawan L, Scott S / Weill Cornell Medical College, New York, NY

Background: First-years students attend an Introductory Emergency Medicine Clinical Skills Course, learning first-responder skills, followed by a single-station objective structured clinical examination (OSCE) to evaluate learning. One goal of the course is to enhance student confidence and comfort in handling "sick" patients.

Objectives: (1) To determine whether student comfort as a first responder correlates with their self-assessment as a first-responder on an OSCE; (2) To determine whether student comfort as a first-responder correlates with their OSCE performance.

Methods: In fall 2012, students completed a post-course single-station OSCE (n=39). The author HG reviewed a video recording of each OSCE and assigned it a subjective "expert score," on a scale of 1 (poor) to 5 (excellent). Students were

also asked to review their OSCE video and give themselves a grade on the same scale ("self-score"). Finally, students were asked: "On a scale of 1 (not at all) to 5 (a lot), how comfortable are you being a first responder?"

Results: 84.2% rated their comfort level as a 3 or a 4; 7.9% rated a 2 and an equal percentage rated a 5. There was a positive correlation between students' comfort rating and self-scores (?=0.60, p=0.001). There was no significant correlation between students' comfort rating and the expert score (?=0.28, p=0.090).

Conclusion: Our study suggests that there is a correlation between students' assessment of their own OSCE performance and their self-reported comfort in being a first-responder. This can either be because students who were comfortable with their skills as a first-responder were more likely to overestimate their performance on the OSCE, or because students who felt they did better on the OSCE based on their video review felt more comfortable with their first-responding skills. Our study also suggests, however, that student comfort does not necessarily predict better OSCE performance.

65 Systems-Based Practice and Practice-Based Learning Milestone-Based Remediation Toolbox

Williamson K, Moreira M, Price C, Quattromani E / Advocate Christ Medical Center, Oak Lawn, IL; Denver Health Medical Center, Denver, CO; Hartford Hospital, Hartford, CT; St. Louis University, St. Louis, MO

Introduction: In 2012, the Accreditation Council for Graduate Medical Education (ACGME) supplemented the core competencies with outcomes-based milestones for resident performance within the six competency domains. These milestones address the knowledge, skills, and abilities that a resident is expected to obtain during the course of training. The systems-based practice (SBP) and practice-based learning (PBL) milestones encompass core emergency medicine (EM) issues such as patient safety and performance improvement. EM educators must be provided with tools that aid in the identification and remediation of residents struggling to achieve proficiency for a particular milestone.

Educational Objectives: The goal of the Council of Emergency Medicine Residency Directors (CORD) Remediation Task Force (Subcommittee on SBP/PBL Milestones) was to develop a guide to aid in milestone-based resident assessment and remediation. The subcommittee sought to provide specific examples of commonly encountered problems followed by remediation strategies. The group also developed a Standardized Direct Observational Assessment Tool (SDOT) to monitor a resident's progress through the remediation process.

Curriculum Design: Building on tools developed at a consensus conference at the 2009 CORD Academic Assembly, the guide generated by this task force provides scenarios of problematic resident behaviors that can be mapped back to milestone levels within the SBP/PBL competencies. Remediation strategies for these deficiencies were then generated. We also devised an SDOT, an evaluation form that specifically targets milestone-based behaviors in order to facilitate evaluation of a resident's progress through the remediation process.

Impact: The program director can utilize these milestone-based tools for assistance in developing a remediation plan for a resident who is not performing adequately in the SBP/PBL competencies. The SBP/PBL remediation instrument can be utilized to improve resident training in the new accreditation system.

66 Teaching and Evaluating ED Handoffs: A Qualitative Study Exploring Resident, Attending, and Nurse Perceptions

Flanigan M, Heilman J, Johnson T, Rushing T, Yarris L / Oregon Health and Science University, Portland, OR

Background: The Accreditation Council for Graduate Medical Education requires that residency programs ensure resident competency in performing safe, effective emergency department (ED) handoffs. Understanding resident, attending, and nurse perceptions of the key elements of an "ideal" ED handoff is a crucial first step to developing feasible, acceptable educational interventions to teach and assess this fundamental competency. This study explores interprofessional perceptions regarding the key elements of ED handoffs.

Methods: Using a grounded theory approach and constructivist/interpretist research paradigm, we analyzed data from three focus groups (FGs) at an urban, academic ED that were conducted for a separate study that aimed to inform standardized ED handoff practices. FG protocols were developed using open-ended questions that sought to understand what participants felt were the crucial elements of ED handoffs. ED Residents, attendings, physician assistants, and nurses were invited to participate. FGs were observed, hand-transcribed and audio-recorded. Data were analyzed using an iterative process of theme and subtheme identification. Saturation was reached during the second focus group, and a third reinforced the identified themes. Two team members analyzed the transcripts separately and identified the same major themes.

Results: ED providers identified that crucial elements of ED handoff include: 1) Process (standardization, information order, tools); 2) Time (brevity, interruptions, waiting); 3) Environment (physical location, ED factors); 4) Culture (provider buy-in, openness to change, shared expectations of signout goals) (Table 1).

Conclusion: Key participants in ED handoff process perceive that the crucial elements intershift handoff in the ED involve the themes of process, time, environment, and culture. Attention to these themes may improve the feasibility and

Table 1. Themes, subthemes, and educational considerations of interprofessional perceptions regarding the crucial elements of emergency department (ED) handoffs.

Theme	Subthemes	Educational considerations
Process	Standardization Information order Available tools (documentation phrases, mneumonics, etc)	• Importance of standardized process • Need for orientation and ongoing monitoring and training of all providers
Time	Brevity Interruptions Waiting	• Recognition of the tension between time constraints and educational mission – learners may not be as efficient as attendings
Environment	Signout location (dedicated space, bedside vs. separate) ED factors (crowding, volume)	• Bedside handoffs may provide a different level of safety for learners to practice handoff skills than provider-only locations • Patient care needs may supercede educational aspects of handoff depending on ED factors
Culture	Provider buy-in Openness to change Shared goal expectations	• Aligning competing operational, patient safety, and educational interests may help increase engagement in handoff interventions • ED culture and provider expectations may impact the feasibility and acceptability of handoff interventions. Soliciting stakeholder engagement early may help increase buy-in.

acceptance of educational interventions that aim to teach and assess handoff competency.

67 Teaching Videos Enhance Students' Ability to Self-Assess their Performance as a First-Responder on Objective Structured Clinical Examinations (OSCEs)

Ghory H, Mahfoud Z, Sawan L, Scott S / Weill Cornell Medical College, New York, NY

Background: First-years students attend an Introductory Emergency Medicine Clinical Skills Course, learning first-responder skills, followed by a single-station objective structured clinical examination (OSCE) to evaluate learning.

Objectives: To determine whether grading benchmark first-responder OSCE videos enhances students' ability to assess their own OSCE performance and whether students find these videos to be a helpful learning tool.

Methods: In fall 2012, a grading rubric was used to give each student (n=39) a "percent score" for the OSCE. The author HG, blinded to the percent score, reviewed video recordings of each OSCE, assigning a subjective "expert score" on a scale of 1 (poor) to 5 (excellent). Students reviewed their own videos, providing a "self-score" out of a 5. They then scored three videos of a first-responder managing the case with poor, average and excellent performance. Students then re-scored their own video. Finally, students were asked: "On a scale of 1 (not at all) to 5 (a lot), how much did the three benchmark videos contribute to your training as a first-responder?"

Analysis: Paired t-test was used to compare self-scores and the Maxwell-Stuart test was used to compare frequency distributions. Spearman's correlation coefficient was used to assess correlations between scores and other variables in the study. All analyses were done using STATA version 11.

Results: 39.5% of self-scores changed after video review, with 80% decreasing. There was a positive correlation between percent and expert scores (?=0.47, p=0.003), and percent and self scores post-video review (?=0.39, p=0.017). 86.8% of the students responded to the evaluation question with a 4 or a 5.

Conclusions: Benchmark videos are a helpful learning tool. Expert scores' correlation with percentage scores suggests that a 5-point grading scale is an effective way to assess OSCEs. Student self-scores after video review aligned more closely with the percentage score, suggesting that videos improved their ability to self-assess.

68 Team Based Learning: Acute Ischemic Stroke

Paden M, Panagos P, Heitsch L, Bavolek R / Washington University in Saint Louis, Saint Louis, MO

Background: Ischemic cerebrovascular accident (stroke) is common in the US. It is the leading cause of adult disability and third most common cause of death. A delay in treating a stroke leads to a worsened neurologic outcome. Tissue plasminogen activator (TPA) is a time-sensitive medication with complex inclusion and exclusion criteria. These issues push emergency physicians to make the diagnosis and create

a management plan rapidly. Complex cases can be anxiety provoking and difficult for a resident to make appropriate clinical decisions.

Educational Objectives: 1. Teach the National Institute of Health Stroke Scale (NIHSS) 2. Apply the NIHSS in a controlled setting 3. Determine a treatment plan based on NIHSS 4. Emphasize the inclusion and exclusion criteria for TPA 5. Reinforce the risks and benefits of using TPA 6. Review current literature on treatment for non-TPA candidates.

Curricular Design: We created a team based learning exercise to help residents diagnose and treat strokes. The exercise started with a test to identify knowledge gaps. Residents were then led through 6 stroke cases in groups. They were supplied with the patient's history and computed tomography followed by a video of an actor/resident displaying deficits based upon a stroke syndrome. The residents tallied the patients NIHSS based on the video. The groups submitted their NIHSS and any discrepancies in scoring were discussed. The groups submitted a treatment plan for the patient's case. At the conclusion, key teaching points about diagnosis, management, and treatment were reviewed with faculty.

Impact: The resident groups initially had significant variability in their scoring on the NIHSS for the patient, but by the end of the session the accuracy greatly improved. The repetition of the cases increased familiarity with the NIHSS as well as the inclusion and exclusion criteria. Session feedback showed the residents enjoyed applying the NIHSS in a nontraditional teaching format and are more confident on stroke treatment decisions.

69 The Correlation Between USMLE and COMLEX Exam Scores for Applicants to a Dually Approved Emergency Medicine Residency: An Eight Year Experience

Kane K, Yenser D, Semler L, Weaver K, Barr G, Goyke T, Burckhart A, Leonetti A, Yoshioka I, Kane B / Lehigh Valley Health Network, Bethlehem, PA; Morsani College of Medicine, University of South Florida, Tampa, Florida

Introduction: With the announced single graduate medical education system, emergency medicine (EM) residencies may see an increase in applicants who submit unfamiliar standardized exam scores. To date, there is limited information positively correlating United States Medical Licensing Examination (USLME) and Comprehensive Osteopathic Medical Licensing Examination (COMLEX) scores for EM applicants.

Objective: To determine the correlation between USMLE and COMLEX scores for applicants to an EM residency.

Methods: After institutional review board (IRB) approval, we retrospectively gathered all exam scores for applicants to our 4 year, 56 member, dually approved EM residency from 2006-13. Included were applicants who submitted scores for both exams. Demographic analysis was descriptive. Scatterplots were used to visualize pairwise relationships. Multiple linear regression models, stratified by test step were created with COMLEX score as the outcome and USMLE score as the predictor value. Participant age and sex were included in each model.

Results: The identified 556 applicants are show in Figure 1. Pair 1 is applicants with both COMLEX Step-1 and USMLE Step-1 scores (n=486). Pair 2 are those with both COMLEX Step-2 and USMLE Step-2 scores (n=356). For Pair 1 66% were male with an average age of 28. For Pair 2, 64% were male; the average age was 28. Mean, standard deviation, and median for Pair 1 on the COMLEX was 551, 69 and 548. For the USMLE it was 216, 16, 217. Results for Pair 2 on COMLEX were 566, 80, 562. USMLE results for Pair 2 were 228, 18, 229. As shown in Figure 2, a strong correlation was observed for Pair 1 ($r=0.78$, $p<0.001$). A linear regression model controlling for sex and age, a one point increase in USMLE Step-1 is associated with a 3.55 point increase in the COMLEX Step-1 score (ÃŸ=3.55; 95% CI:[3.30-3.80], $p<0.001$). A similar strong correlation was observed for Pair 2 ($r=0.72$, $p<0.001$).

Conclusions: In our cohort a strong positive correlation between USMLE and COMLEX was found. This relationship may aid EM residency evaluation of applicants who submit test scores with which they are not familiar.

e 1. Participant test data

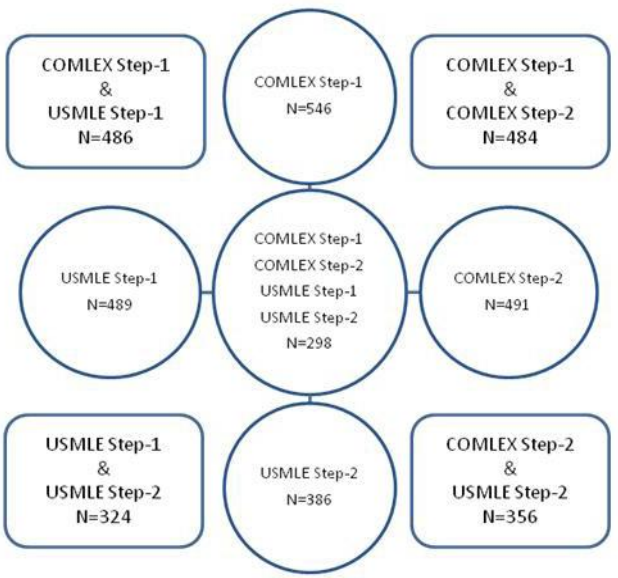

Figure 1. Participant test data.
USMLE, United States Medical Licensing Examination; *COMLEX*, Comprehensive Osteopathic Medical Licensing Examination

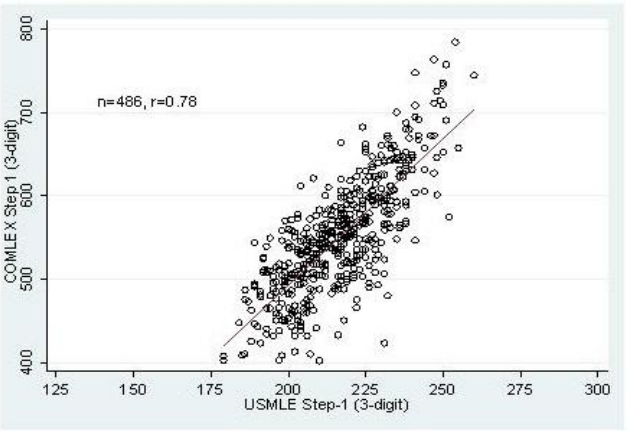

Figure 2. Scatterplot of USMLE Step-1 and COMLEX step-1 scores with least squares regression line. *USMLE*, United States Medical Licensing Examination; *COMLEX*, Comprehensive Osteopathic Medical Licensing Examination

70 The Effect of Hospital Mergers on Residency Education: The Perceptions of Residents in the New Mt. Sinai Health System

Davey K, Golden A, Rabrich J, Clark M / Mt Sinai at St. Luke's-Roosevelt, New York, NY

Background: Rising healthcare costs in the United States have pushed many hospitals to merge, including many that are home to residency programs. Information about resident perceptions of mergers could direct resident education and affect policy at a residency and hospital level.

Objectives: The primary aim of this study is to examine resident physicians' (RPs) perceptions of a hospital merger's effects on residency education and patient care across multiple specialties. To our knowledge this multidisciplinary study is the only study of its kind.

Methods: RPs at a newly merged, 5 hospital system were recruited to complete a survey on their perception of the merger with respect to education and patient care.

Results: We received 221 completed questionnaires from RP's spanning 11 specialties. Among RPs, the most anticipated educational benefits of the merger include rotating at other sites (64.6%) and improved access to electives (57.3%).The most anticipated benefit to patient care is an integrated electronic medical record (92.4%). RP's main concerns are a change in culture at their program (20.6%). Most (67.6%) think the merger will impact their education. However, RPs at the acquiring institution are more concerned about a negative impact on the reputation of their program (17.4% vs. 4% $p<0.01$), while RP's at the acquired institutions are more concerned about change in the culture of their program (31% vs. 17% $p=0.03$).

Conclusion: RPs are optimistic that mergers can lead to increased educational opportunities and improved patient care through shared electronic medical record. They are wary about the impact mergers might have on the culture and reputation of their home programs. Leadership might optimize education and gain RP support by focusing on collaboration efforts, while allowing each program to retain its own autonomy.

71 The Impact of a One-Day Free Point of Care Ultrasound Conference to Medical Students

Lobo V, Joshi N, Chao A, Poffenberger C, Williams S, Perera P, Gharahbaghian L / Stanford University Medical Center, Stanford, CA

Background: Multiple medical specialties use point-of-care ultrasound (POCUS); hence medical student education may be enhanced through incorporating POCUS training. In an effort to introduce POCUS to medical students, the Stanford School of Medicine and Division of Emergency Medicine hosted UltraFest: a free POCUS symposium open to all medical students. Stanford UltraFest 2014 built on prior curricula by including novel POCUS-related simulation training to teach crisis resource management. It also evaluated knowledge gains through "UltraFest Olympics", a competition amongst medical students.

Objective: To evaluate the effect of a novel one-day ultrasound curriculum on the skill-levels of a wide cohort of medical students.

Methods: All participants pre-registered online, requiring them to complete a pre-test self-assessment of their confidence level for their current POCUS skill level. At the end of the conference, students re-took the same survey. (Figure 1). Pre-test assessment survey results from students who did not attend UltraFest were excluded.

Results: Of the 193 pre-test surveys enrolled in the study, 143 identified their pre-test POCUS skill level as 'minimal', 47 as 'intermediate', and 3 as 'advanced' (Figure 2a). Out of the 183 post-test surveys, 43 identified their post-test POCUS skill level as 'minimal', 125 as 'intermediate', and 16 as 'advanced'. 10 students who attended the event did not fill out the post-survey. We used a Wilcoxan rank sum test that showed a statistically significant shift ($p<0.05$) in the median assessment, signifying improvement from the pre- and post-test survey (Figure 2b).

Conclusions: Our study validates the utility of hands-on learning conferences, such as Stanford's UltraFest, in teaching POCUS to medical students regardless of initial skill level. Our unique curriculum (including lectures, hands-on instruction, simulation and final "Olympics" to test skills) successfully improved students' self-assessed skill level in POCUS.

HOW WOULD YOU RATE YOUR BEDSIDE ULTRASOUND SKILL LEVEL NOW?

- **MINIMAL (CAN TURN ON MACHINE, SELECT PROBE, POSSIBLY MAKE OUT A HEART)**
- **INTERMEDIATE (CAN DO BASIC APPLIATIONS FAST, ECHO WELL)**
- **ADVANCED (CAN DO APPLICATION AS WELL AS TEACH OTHERS)**

Figure 1.

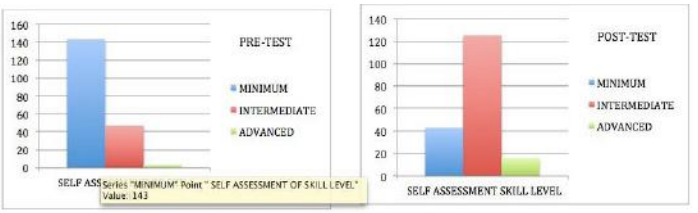

Figure 2a.

Pre-Test

0%	25%	50%	75%	100%
0	0	1	1	3

Post-Test

0%	25%	50%	75%	100%
1	2	2	2	3

Figure 2b.
0=no knowledge, 1=minimal knowledge, 2=intermediate, 3=advanced.
50% is median. median is 1=minimal in the pre test and 2=intermediate in the post-test.

72 The Influence of Emergency Medicine Residents on Emergency Medicine Attending Productivity

Alkhalifah M, Deibel M, Lowry J / Central Michigan University, Saginaw, MI; Covenant Healthcare, Chicago, IL; Saginaw Valley State University, University Center, MI

Background: Minimal data exist regarding the influence of residents on emergency medicine (EM) physician productivity and flow of patients in the emergency department. A literature review revealed one study that provided the impact of residents on the number of patients seen per hour[1]. Several studies provided assessment of resident performance with focus on the educational aspects[2-4]. We evaluated whether emergency residents have any influence on EM attending productivity.

Objectives: To evaluate the influence of EM residents on EM attending productivity.

Methods: A retrospective observational study was completed utilizing electronic chart review of EM attending 8-hour shifts in a level 2-trauma center with 85,000 visits per year. This emergency department (ED) is affiliated with a 3 year, 30 resident program. We included all ED attending shifts from January 2012 to April 2013. The total number of shifts was 4683, which included 2084 with attending alone and 2599 with a resident. Resident shifts include 1-2 residents paired with 1 attending. This study compares ED attending alone to ED attending with a resident. We looked at several productivity measures, such as patients/hour, patients/shift, admitted patient/shift, relative value units/hour (RVUs), ambulance count/shift, RVU/patient and length of stay.

Results: A one-way ANOVA was used to measure the difference between the groups (Table 1). The mean number of patients seen/shift (18.8 vs. 15) and patients seen/hour (2.24 vs. 1.9) in the resident group was significantly more than attending alone (Figure 1). Resident shifts also had higher relative value unit/hour, ambulance count and total number of admitted patients

Table 1. A graphical comparison of mean number of patients.

				95% Confidence interval for mean	
		N	Mean	Lower bound	Upper bound
Number of patients seen per hour	(attending alone)	2084	1.9020	1.8815	1.9225
	(with resident)	2599	2.2400	2.2217	2.2583
Number of patient seen per shift	(attending alone)	2084	15.19	15.02	15.37
	(with resident)	2599	18.83	18.68	18.99
Number of RVUs per hour	(attending alone)	2084	5.9508	5.8884	6.0133
	(with resident)	2599	7.4081	7.3334	7.4828
Ambulance count per shift	(attending alone)	2084	3.03	2.94	3.12
	(with resident)	2599	4.41	4.31	4.52
Admitted pt. count per shift	(attending alone)	2084	3.62	3.52	3.72
	(with resident)	2599	5.12	5.00	5.24
LOS-Minutes between patient arrival and depart ED	(attending alone)	2084	3127.0674	3081.1815	3172.9532
	(with resident)	2599	4052.0583	4004.0733	4100.0432

RVU, Relative Value Units; *ED*, Emergency Department; *LOS*, Length of Stay

per shift, but the differences were not statistically significant.

Conclusions: Working with residents improves ED attending productivity in terms of patients seen per hour and total patients seen per shift. We did not compare the different postgraduate training levels.

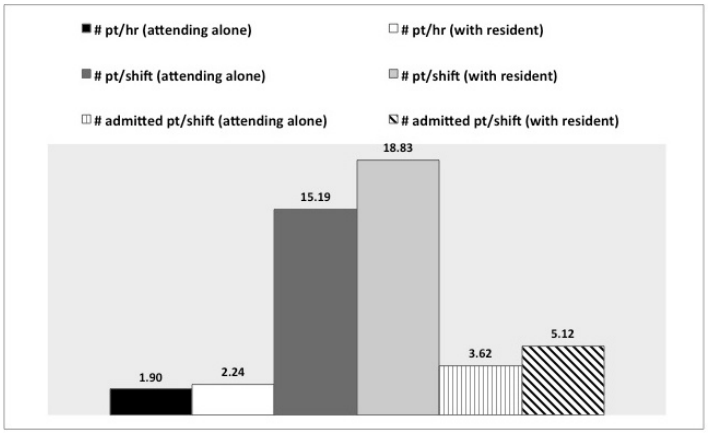

Figure 1. A graphical comparison of mean number of patients.

73 The I-TRAC Curriculum: Individualized Training of Residents through Assessment and Clinical Competency

Fredette J, Bounds R / Christiana Care Health System, Newark, DE

Background: Graduate medical education has become more competency-based and emergency medicine (EM) is leading this transition. Milestones, daily feedback, formative evaluations, and Clinical Competency Committees (CCC) have provided educators with more accurate assessments of resident performance, but programs still tend to use a "one size fits all" model. Each resident, regardless of their mastery, or difficulty, in achieving competencies, is provided the same clinical experience.

Objectives: With specific and timely performance metrics available to educators, there is a clear benefit of having a flexible clinical curriculum tailored to each resident's competency level in order to maximize the value of their training.

Design: Our postgraduate year (PGY) 1-3 block curriculum was evaluated by a group of faculty and resident leaders, with attention to educational value and achievement of goals and objectives, then modified to create flexibility. Interns are given added time in the emergency department (ED) to allow for earlier assessments of competency. Then, based on CCC evaluations, the block curriculum for PGY2 and 3 residents becomes individualized along one of 3 tracks.

Track 1 is the standard curriculum in which the graduation of responsibility is appropriate for the majority of the residents. Track 2 allows a focus on areas where deficiencies are identified and EM time is tailored to address specific needs. Finally, Track 3 is designed for residents who are mastering competencies earlier than expected. Residents in Track 3 will benefit from the acquisition of advanced skills such as ED flow management, bedside teaching, operational leadership, or clinical research.

Impact: The I-TRAC curriculum replaces the standardized block curriculum in which all residents graduate with the same skill set. This novel individualized curriculum responds to resident's strengths and weaknesses and allows educators to apply milestone-based assessments in a way that targets specific areas of need and maximizes residents' potential.

74 The Patient Care Continuum: Transition of Care to the Discharged Patient

Choudhri T / George Washington University, Washington, DC

Discharging patients is not usually recognized as a transition of care, nor is it imbedded in curriculums. Engel et al. found that among patients surveyed about their discharges, top knowledge deficits were home care and when to return to the emergency department (ED). Learning how to discharge patients is vital to education to foster a culture of accountability,and to highlight medical-legal considerations that are inherent in discharging.

Objectives: Review common discharge errors/ misconceptions; provide tools to give and write discharge instructions by outlining components of adequate instructions; strengthen current skills by allowing practice and critique of common ED scenarios.

Design: Residency leadership identified that residents do not understand the importance of discharging a patient and the legal/patient care ramifications inherent to this process, and implemented this module during Grand Rounds. Using JCAHO/CMS standards for discharging, a self-assessment tool was used to identify weaknesses, followed by a lecture of common errors of physicians and the existing evidence based medicine regarding discharges. Utilizing American College of Emergency Physicians module-Planning Safe and More Effective Aftercare, components of instructions were outlined as they correlate with JCAHO/CMS standards. Residents divided into groups to practice on common ED scenarios, and then presented to the large group for critique. One month following this, a survey showed 100% of respondents felt this session was "Very Important" or "Important" to their education. 75% felt this module changed their practice - 50% of which said it changed both their verbal and written discharges. Discharging patients is a component of every specialty, and without appropriate instructions our patients are not receiving quality aftercare and thus, have a high likelihood for return visits and bad outcomes. This was created using standards all physicians should adhere to, and was focused into ED specific scenarios that easily translates to any emergency medicine residency across the country.

1. Are the discharge instructions typewritten (printed by computer)?
2. Are they legible? (If two or more people cannot read them, they are illegible.)
3. Are they written in a language and at a reading level the patient understands?
4. Do they include the physician's name?
5. Do they include an explanation of the injury or illness or discharge diagnosis?
6. Do they include a list of signs and symptoms to be aware of and what to do if they occur? (For example, call your primary care physician, call 911, or come back to the emergency department.)
7. Do you document patient understanding?
8. Do you document that the patient was given the opportunity to ask questions?
9. Do they specify a date, time, and provider for a follow-up visit or that a follow-up appointment was made before the patient left the emergency department?
10. Are they signed by the patient or the patient's authorized representative?

Figure 1. Self assessment of discharge instructions.

75 The Use of Uniform Clinical Scenarios to Produce Milestone Proficiency Scoring

Bradford-Saffles A, Merrill R, Cregar C, Bosman E, South A, Fire F, Brown J / Akron General Medical Center, Akron, OH; The Ohio State University, Columbus, OH

Introduction: The Accreditation Council for Graduate Medical Education (ACGME) requires reporting of Milestone proficiency levels, based on objective assessment. Programs have struggled with assessment methods. We report on a method of objective assessment in which clinical scenarios are presented to a resident, and scored using the Milestone framework. This satisfies multiple educational needs of the resident and residency.

Educational Objectives: There were several objectives of this initiative. The first was to present uniform teaching points related to clinical care to all residents individually. The second was to assess management of each clinical scenario using the Milestone framework. This process was facilitated by the bank of Council of Emergency Medicine Residency Directors clinical scenarios.

Curricular Design: Each clinical faculty was assigned to two clinical cases. A total of 48 cases were chosen, with 12 designated to emergency medicine (EM) 1 level, and 18 each to EM2 and EM3 levels based on perceived complexity. Faculty were assigned to four specific conference days a year in which 4-6 faculty would present one of their cases to individual residents. A separate scoring sheet for each clinical scenario was developed using 12 of the 23 Milestone subcompetencies.(Table 1) Scoring was anchored to Needs Improvement, Meets Expectations, and Above Expectations, equated with Levels 2, 3, and 4 for each subcompetency, respectively.

Impact/Effectiveness: From July, 2014 through November 2014, EM1, EM2, and EM3 residents completed 60, 95, and 88 clinical scenarios, respectively. Scoring demonstrated progressive improvement by year level. (Table 2) Within each year level there was variation by resident. This project benefits residents and the residency. All residents are exposed to the same 48 clinical scenarios, making training more uniform. Each attending becomes relatively expert in their two cases. The residency benefits by increased scheduled conference attendance by attendings as well as an additional methodology for Milestone proficiency scoring.

Table 1. Clinical scenario scoring results by PGY level.

Subcompetency	PGY1	PGY2	PGY3
Emergency stabilization (PC1)	3.05	3.26	3.36
Performance of focused history and physical exam (PC2)	3.19	3.18	3.43
Diagnostic studies (PC3)	3.13	3.27	3.10
Diagnosis (PC4)	3.20	3.12	3.49
Pharmacotherapy (PC5)	2.93	3.21	3.23
Observation and reassessment (PC6)	3.21	3.17	3.45
Disposition (PC7)	3.05	3.39	3.36
Medical knowledge (MK)	3.00	3.11	3.30
Professional values (PROF1)	2.87	3.13	3.12
Accountability (PROF2)	3.14	3.20	3.43
Patient centered communication (ICS1)	3.06	3.22	3.36
Team management (ICS2)	3.01	3.14	3.19

PGY, postgraduate year; *ICS*, interpersonal and communication skills;

	Expectations	Expectations	Expectations
Emergency Stabilization (PC1)	Does not timely initiate appropriate antibiotics	IV Fluids initiated; Appropriate antibiotics given	IV Fluids and pain control given; Diagnosis zeroed in on quickly
Performance of Focused History and Physical Exam (PC2)	Does not evaluate patient thoroughly	Abdominal pain is solicited; focused history questions related to potential causes of abdominal pain	Evaluates for serious causes of abdominal pain; quickly appears to ascertain significance
Diagnostic Studies (PC3)	Blanket orders labs; Orders CT scan initially	Orders labs in thoughtful manner, including lipase Orders plain films first	Quickly considers perf viscus. Orders plain films quickly;
Diagnosis (PC4)	Does not diagnose perforated viscus, or does so slowly	Diagnoses perforated viscus quickly	Diagnoses perforated viscus quickly, acts upon it
Pharmacotherapy (PC5)	Does not give pain meds, or inadequate pain meds given; antibiotics late	Gives adequate pain medication and antibiotics	Gives pain medication and appropriate antibiotics early in case
Observation and Reassessment (PC6)	Does not reassess	Reassesses effects of pain medication and antibiotics	Reassesses effects of medications; considers deterioration
Disposition (PC7)	Admits to hospital floor, no surgical or slow surgical consult	Admits to hospital bed with surgical consult	Consults surgery quickly, argues for OR
Medical Knowledge (MK)	Does not understand presentation or causes of perforated viscus	Understands presentation or causes of perforated viscus	Understands need for quick reaction to perforated viscus
Professional Values (PROF1)	Does not introduce self	Introduces self	Asks patient about care beliefs related to treatment
Accountability (PROF2)	Does not recognize limitations of knowledge and care	Recognizes lapses in knowledge and care	Recognizes lapses in knowledge and care; seeks answers
Patient Centered Communication (ICS1)	Does not communicate with patient	Elicits from patient their concerns	Communicates with patient addressing concerns
Team Management (ICS2)	Communicates pertinent information to colleagues	Ensures transitions of care are communicated	Resolves difficulties with consultants

Critical Actions	Yes/No
1. Diagnose perforated viscous	Yes ☐ No ☐
2. Orders upright CXR and/or complete Abd. series	Yes ☐ No ☐
3. Consults Surgery	Yes ☐ No ☐
4. Begins antibiotics prior to OR	Yes ☐ No ☐

Figure 1. Sample clinical scenario scoring sheet.
IV, intravenous; *CT*, computed tomography; *OR*, operating room

76 The Use Of Voice-over Internet Protocol (VoIP) for Residency Interviews: The Wave of the Future?

Vempati A, Nouhan P / St. John Hospital and Medical Center, Detroit, MI

Introduction: Residency applications along with interview travel and hotel expense require increasing funds for the average residency applicant. Emergency medicine (EM), in particular, is currently among the more competitive specialties. EM candidates feel pressure to apply to a higher number of programs in order to match. In addition, the Electronic Residency Application Service (ERAS) has a crescendo fee schedule that penalizes the applicant with more than ten applications. This environment challenges the EM residency applicant to survive the interview season without incurring debt.

Educational Objectives: Our research survey examines the use of Voice-over Internet Protocol (VoIP) methods such as FaceTime or Skype for residency interviews.

Curricular Design: All interview candidates were anonymously surveyed at an urban EM program with 36 positions after the rank order lists were submitted. The survey revealed that on average the candidates applied to 59 programs and interviewed at 16 programs. It also showed that 38% of the respondents had financial constraints during interview season. Fifty-five percent of those who replied said they would consider VoIP for interviewing and 32% said that they would select a residency without a physical visit.

Impact: Our results indicate that VoIP interviews are an effective means of assisting programs with high meal and hotel costs. More importantly, our survey indicates that student applicants strapped with the increasing financial burden of escalating application fees and travel expense would find VoIP an attractive adjunct to the in-person interview.

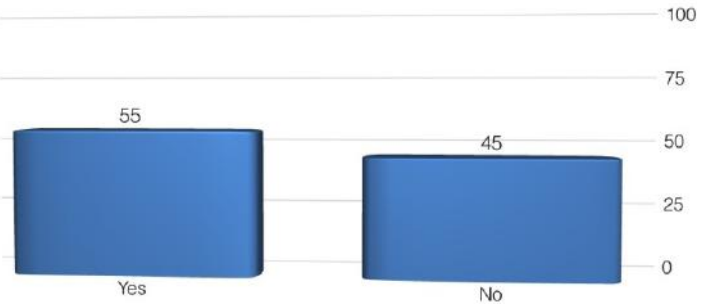

Figure 1. Percentage of candidates who reported they would consider VoIP as a form of interviewing.

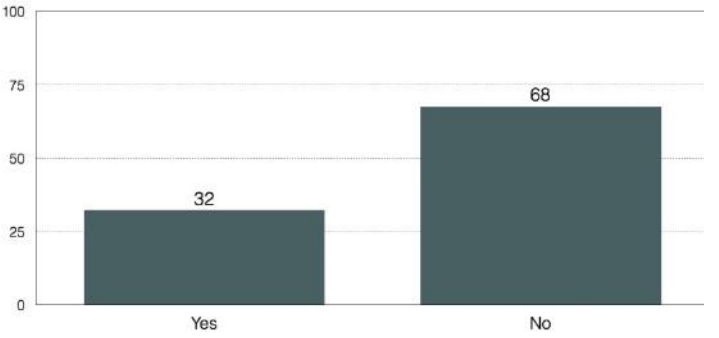

Figure 2. Percentage of candidates who reported they would select a residency program without a visit.

77 Ultrasound Mini Fellowship

Powell J, Chin E, Summers S / San Antonio Military Medical Center Emergency Medicine Residency, Fort Sam Houston, TX

Introduction/Background: Training in the use of emergency ultrasound (EUS) is an Accreditation Council for Graduate Medical Education requirement for all emergency medicine (EM) residency programs. There are many EM residency programs with EM faculty who have limited to no training in the core EUS applications. A lack of proficiency by EM faculty is an obstacle to adequate EUS training for residents, and a barrier to the use of ultrasound in daily practice.

Educational Objectives: Increased capability and comfort-level of EUS performed by EM faculty; improved EUS training of EM residents by EM faculty; increased EUS credentialing of EM faculty; increased utilization of clinical EUS by EM faculty; increased EM faculty productivity; and, increased patient safety and patient satisfaction.

Curricular Design: The mini-fellowship is a 4-week comprehensive, skill-building curriculum (see Figure 1). It focuses on developing competency in core EUS applications

(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

Amin D, Jhun P, Bright A, Herbert M / University of Southern California, Los Angeles, CA

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.

82 What Does FOAM Cover? An Evaluation of Emergency Medicine Core Content Covered by Free Open Access Medical Education Resources

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Background: Free Open Access Medical Education (FOAM) resources are increasing in number and utilization by emergency medicine (EM) physicians. However, no study to date has evaluated what EM core content is covered by FOAM resources.

Objective: To quantify EM core content covered by FOAM resources, and identify any predominant FOAM topics.

Methods: This was a retrospective study, approved by the local institutional review board. EM core content was defined by topics covered in the Model of the Clinical Practice of Emergency Medicine (MCPEM), the basis for all American Board of Emergency Medicine exams. Foamem.com, which aggregates 192 FOAM resources at the time of this writing, was used to review all posts between 7/1/2013 and 6/30/2014. Posts were categorized according to the topics found in the MCPEM, and could cover more than one topic. Repeat posts and summaries were not re-recorded. Non-English posts were excluded.

Results: 915 total EM topics in 20 sections were identified based on the MCPEM. 6,424 FOAM posts were reviewed. 71.5% (654/915) of the topics were covered providing 7,279 data points. Section 19.0: Procedures was covered the most, comprising 31.4% (2,285/7,279) of the data points. Four sections tied by percentage as the least represented, each comprising only 0.6% of the data points (Cutaneous, Immune, Obstetrics and Gynecology, and Non traumatic musculoskeletal disorders). Resuscitation, airway techniques, electrocardiogram interpretation, ultrasound, and research/evidence based medicine/interpretation of the literature were disproportionately represented topics, combining for 23% of the data points (1,674/7,279).

Conclusions: This data suggests a trend of imbalanced and incomplete coverage of EM core content in FOAM. The study is limited in that it is retrospective, and subjectively views resources available on the referred website. More comprehensive and complete coverage of EM core content in FOAM is needed if it is to be used more broadly, especially in resident education.

83 WIREd for Milestones: A Novel Tool for Resident Evaluation

Nagarwala J, Vallee P, Baliga S, Folt J, Jaskulka B, Hays J, Slezak M, Goyal N / Henry Ford Hospital, Detroit, MI

Background: The Next Accreditation System has fundamentally altered the evaluation process for emergency medicine (EM) residents. We developed a novel Web-based Individualized Resident Evaluation (WIRE) instrument to make this milestone-based evaluation process intuitive and quick for faculty, while providing performance data to residents and administrators. Each WIRE form asks faculty to complete a checklist of behaviors (positive and negative) exhibited by the resident on that shift.

Objectives:

1. Examine the effectiveness of WIRE in collecting milestone-based resident evaluation data
2. Evaluate faculty practices and effort in using WIRE
3. Evaluate faculty satisfaction with WIRE

Methods: WIRE was deployed on July 1, 2013 and each faculty member was asked to complete 1 evaluation/resident/shift. A 15-minute orientation was provided to all faculty. In April 2014, faculty were surveyed on their use of WIRE. Data for the period 7/1/13 through 6/30/14 was analyzed using descriptive statistics.

Results: Data was recorded on 53 residents by 38 faculty. 2,930 WIREs were completed in 12 months, of which 64% (1,870) had additional descriptive comments on faculty opinion of resident performance, 32% (596) of which were discussed with the resident. Overall 11,107 observations were recorded for 166 distinct milestones. Faculty completed approximately 1.05 WIREs/shift. 69% of faculty reported completing a WIRE at the end of a shift, and the rest within a few days. 53% of faculty described themselves as "very satisfied" using WIRE to evaluate residents and 39% were "somewhat satisfied". Our experience with WIRE is described in Table 1.

Conclusion: WIRE provides an intuitive and quick method for EM faculty to record resident evaluations using the Milestones framework. It provides robust evaluation data to residents and residency administrators and is quickly adopted with minimal training requirements. It also enables specific and timely feedback for residents.

Table 1. Experience with the WIRE tool.

	Mean	Median	Standard deviation	Range
No. of WIREs per resident	55.3	62	30.0	6-105
No. of Milestones observed per WIRE	3.8	4	2.2	1-23
No. of Milestones observed per resident	209.6	232	112.5	26-436
No. of WIREs completed per staff physician	77.1	72	47.5	2-208
Self-reported time taken to complete a WIRE (minutes)	3.8		2.9	0.5-15

WIRE, web-based individualized resident evaluation.

Best of the Best Presentations

84 A Simulation-Based Curriculum for Evaluating the Entrustable Professional Activities (EPAs) During the Emergency Medicine Clerkship

Moadel T, Evans L / Yale University School of Medicine, ANew Haven, CT

Introduction: Program directors (PDs) have expressed concern that some medical school graduates are not prepared for residency. This is a problem for emergency medicine (EM) because our residents treat critically ill patients and should all have a baseline level of competency. To address this issue, the American Association of Medical Colleges (AAMC) developed the Entrustable Professional Activities (EPAs), a list of tasks and responsibilities that medical students are expected to perform unsupervised upon graduation. It is likely that EPA evaluations will soon become embedded within existing medical school curricula and clerkships. Since the purpose of the EPAs is to evaluate whether medical students can perform these tasks independently, we can deduce that not all students are competent in all tasks. Since we do not know which tasks students can or cannot perform independently, one of the safest ways to evaluate them is through medical simulation.

Objectives: To develop a simulation-based framework for evaluating the EPAs during the EM clerkship.

Design: While all EPAs are relevant to EM, a majority can be evaluated through simulation, and 2 can be evaluated only by simulation (Figure 1). Our curriculum involves 1 weekly simulation session per 4 week clerkship where the student will independently perform 1 scenario. A maximum of 4 EPAs are evaluated per scenario. Each EPA is evaluated at least twice (before and after the half-way point) (Figure 2a). EPA performance is graded using a standardized scoring vignette which remains static for each EPA, and is based upon bulleted lists provided by the AAMC in their document, Core EPAs for entering residency (Figure 2b). Students receive feedback on performance and are tracked longitudinally.

EPA 1: Gather a history and perform a physical examination
EPA 2: Prioritize a differential diagnosis following a clinical encounter
EPA 3: Recommend and interpret common diagnostic and screening tests
EPA 4: Enter and discuss orders and prescriptions
EPA 5: Document a clinical encounter in the patient record
EPA 6: Provide an oral presentation of a clinical encounter
EPA 7: Form clinical questions and retrieve evidence to advance patient care
EPA 8: Give or receive a patient handover to transition care responsibility
EPA 9: Collaborate as a member of an interprofessional team
***EPA 10: Recognize a patient requiring urgent or emergent care and initiate evaluation and management**
EPA 11: Obtain informed consent for tests and/or procedures
***EPA 12: Perform general procedures of a physician**
EPA 13: Identify system failures and contribute to a culture of safety and improvement

Legend:
Bold = EPAs that can be evaluated using simulation
* = EPAs that can *only* be evaluated using simulation

Figure 1. *EPA*, entrustable professional activities

Impact: A simulation-based curriculum during the EM clerkship may evaluate EPAs without compromising patient safety. Identification of and remediation of weak areas should improve competence and thus the proficiency of incoming interns.

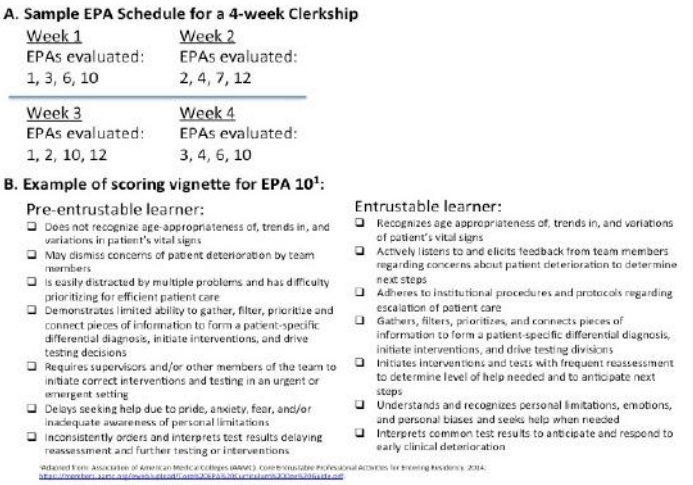


Figure 2. *EPA*, entrustable professional activities

85 ALiEM AIR Series: Curating, Evaluating, and Monitoring Individualized Interactive Instruction Using Social Media Resources

Joshi N, Grock A, Morley E, Swaminathan A, Ankel F, Branzetti J, Taira T, Yarris L, Lin M / Stanford University, Stanford, CA; SUNY Downstate Medical Center, Brooklyn, NY; Stony Brook University, Brooklyn, NY; New York University, New York, NY; University of Minnesota, St. Paul, MN; University of Washington, Seattle, WA; University of Southern California, Los Angeles, CA; Oregon Health and Science University, Portland, OR; University of California San Francisco, San Francisco, CA

Background: In 2008, the emergency medicine (EM) Resident Review Committee endorsed a change in educational requirements to allow for asynchronous learning, or Individualized Interactive Instruction (III). This change coincided with increasing use of social media (SM) resources in medical education. Despite widespread SM use by learners, residency programs struggled to incorporate SM into III due to difficulties providing oversight, monitoring participation, and assessing quality of these resources. Academic Life in Emergency Medicine (ALiEM)

created the ALiEM Approved Instructional Resources (AIR) series to address these difficulties.

Objectives: ALiEM AIR series provides EM residency programs curated SM options for III. The series fulfills Accreditation Council for Graduate Medical Education requirements for III (must monitor and evaluate resident participation, provide faculty oversight, and monitor program effectiveness), by 1) Recruitment of editorial board to evaluate online resource quality; 2) Development of scoring instrument to rate each resource, applying principles of instrument design; and 3) Piloting of series to determine feasibility and user satisfaction.

Curricular Design: Each module begins with a set of articles that are scored by the Executive Board using an internally derived scoring system (Figure 1). Articles are limited to those published within last 12 months. Resident participation is tracked using Google Forms. Residency programs can securely obtain this information through ALiEM.

Impact: This innovation was designed to address the growing need for faculty oversight and quality control for residents who access SM resources for III. As of November 2014, 4 modules are available with 30 participating US residency programs (Figure 2). The most recent module 1-week Google Analytics data had 348 page-views from 167 cities. Studies are in progress to collect validity evidence to further guide scoring instrument use.

Tier 1: BEEM Rater Scale	Score	Tier 2: Content accuracy	Score	Tier 3: Educational Utility	Score	Tier 4: EBM	Score	Tier 5: Referenced	Score
Assuming that the results of this article are valid, how much does this article impact on EM clinical practice?		Do you have any concerns about the accuracy of the data presented or conclusions of this article?		Are there useful educational pearls in this article for residents?		Does this article reflect evidence based medicine (EBM) and thus lack bias?		Are the authors and literature clearly cited?	
Useless information	1	Yes, many concerns from many inaccuracies	1	Low value: No valuable pearls	1	Not EBM based, only expert opinion	1	No	1
Not really interesting, not really new, changes nothing	2		2		2		2		2
Interesting and new, but doesn't change practice	3	Yes, a major concern about few inaccuracies	3	Yes, but there are only a few (1-2) valuable or multiple (>=3) less-valuable educational pearls	3	Minimally EBM based	3		3
Interesting and new, has the potential to change practice	4		4		4		4	Yes, authors and general references are listed (but no in-line references)	4
New and important: this would probably change practice for some EPs	5	Minimal concerns over minor inaccuracies	5	Yes, there are several (>=3) valuable educational pearls, or a few (1-2) KEY educational pearls that every resident should know before graduating	5	Mostly EBM based	5		5
New and important: this would change practice for most EPs	6		6		6		6		6
This is a "must know" for EPs	7	No concerns over inaccuracies	7	Yes, there are multiple KEY educational pearls that residents should know before graduating	7	Yes exclusively EBM based (unbiased)	7	Yes, authors and in-line references are provided	7
Your Score									

Figure 1.

Figure 2.

86 The Patient Experience and High-Fidelity Simulation

Werner S, Noeller T / MetroHealth Medical Center, Cleveland, OH

Introduction: The emergency department (ED) version of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is coming. In our patient satisfaction surveys, patients treated by residents gave lower patient satisfaction scores. To convey the importance of the patient experience, we developed a patient experience simulation.

Objectives: This experience provided residents with the patient perspective of an ED visit in order to fully appreciate the drivers of patient satisfaction.

Design: A full-immersion, in-situ simulation was used. The sim was conducted for over two 4 hour periods in the ED, with Â½ of the class in each sim. ED staff was briefed just prior to the sim.

Interns were paired, with one as patient, the other as family member. Patients were provided with background info (motor vehicle collision) (MVC) and chief complaint (knee/neck pain). Patients were immobilized and transported via ambulance to the trauma bay. Family members were separated for registration. Patients were assessed by a doctor of medicine (MD), registered nurse (RN) and medic, and sent to radiology. After simulated films, patients were taken to a hall space and reunited with family.

Patients were given cues to heighten awareness of typical patient needs (You have 10/10 right knee pain, you need meds, you have to void, etc.) An RN and two MDs continued to role-play caregivers, providing test results, etc. Discharge instructions were provided. Each intern completed a Press-Ganey survey. A debrief was held, using survey results and discussion points of the positive and negative aspects, and emotional response to the experience.

Impact: Participants overwhelmingly felt this was a powerful sim that heightened awareness of the patient experience. The expressed motivation to address the full array of patient needs including pain relief, privacy, comfort, communication, etc. Residents indicated they would be far more cognizant of these needs based on their own patient experience.

87 Use of Skip Logic Embedded Within the Electronic Medical Record for Milestone-Based Resident Evaluation

Marshall J, Chung A, Welniak T, Saloum D, Gupta K, Weiner C / Maimonides Medical Center, Brooklyn, NY

Background: Adoption of milestones by the Accreditation Council for Graduate Medical Education and American Board of Emergency Medicine represents a major change in the standards by which emergency medicine residents are evaluated. Guidance is limited in regards to the efficacy of available assessment tools used to compare residents against these standards. The ubiquity of electronic medical records (EMR) provides a potentially valuable resource through which program directors relate assessments to specific patient encounters, resulting in a more accurate assessment of the resident's clinical skills.

Objectives:

- Propose a novel means of milestone assessment utilizing EMR
- Align resident evaluation with patient care
- Accurately measure resident and program-wide deficiencies to provide targeted curricular improvement

Design: Currently, attending-level mandatory questions in the EMR are necessary to complete a patient encounter. Using our EMR, capable of branching to other questions based on yes/no answers (skip logic), a series of milestone based questions will be added to this section. In 3 clicks, attendings will be able to evaluate resident performance based on each encounter. Each week a different milestone will be evaluated. Data collected over many encounters will ensure real-time evaluation data, but will be collected in a separate database and not part of the patient's record.

Impact: Our innovation adds to the evolving process of graduate medical education milestone assessment in two ways: 1) Demonstrate a simple method for integrating formative evaluations into every patient encounter, creating more accurate measures of resident performance. 2) Skip-logic evaluations provide an intuitive method for faculty to assess resident performance across a broad range of knowledge, behaviors and skills that is more in line with the goals of the Next Accreditation System compared to traditional Likert scale scoring. This method provides more concrete feedback, less range restriction, and allows for easier identification of residents at risk and specific areas of concern.

Curricular Innovations Oral Presentations

88 An Expert Educator Teaching Shift Used as a Method to Assess Milestones in Students

Kman N, Leung C, Hartnett D, Greenberger S, Bachmann D, Way D, Khandelwal S, Martin D / The Ohio State University College of Medicine, Columbus, OH

Background: Our institution implemented a competency-based curriculum in 2011 called the Lead. Serve.Inspire (LSI Curriculum). Coinciding with this is the development and publication of twenty-four competency-based emergency medicine (EM) clerkship milestones for fourth-year medical students. In response to both low student evaluations of our direct observation of competence requirement and the development of these milestones, our clerkship implemented an expert educator shift.

Educational Objectives: To use an expert educator teaching shift as a way to improve direct observation of competence and assessment of the newly published medical student milestones in EM.

Curricular Design: One of 3 expert educators

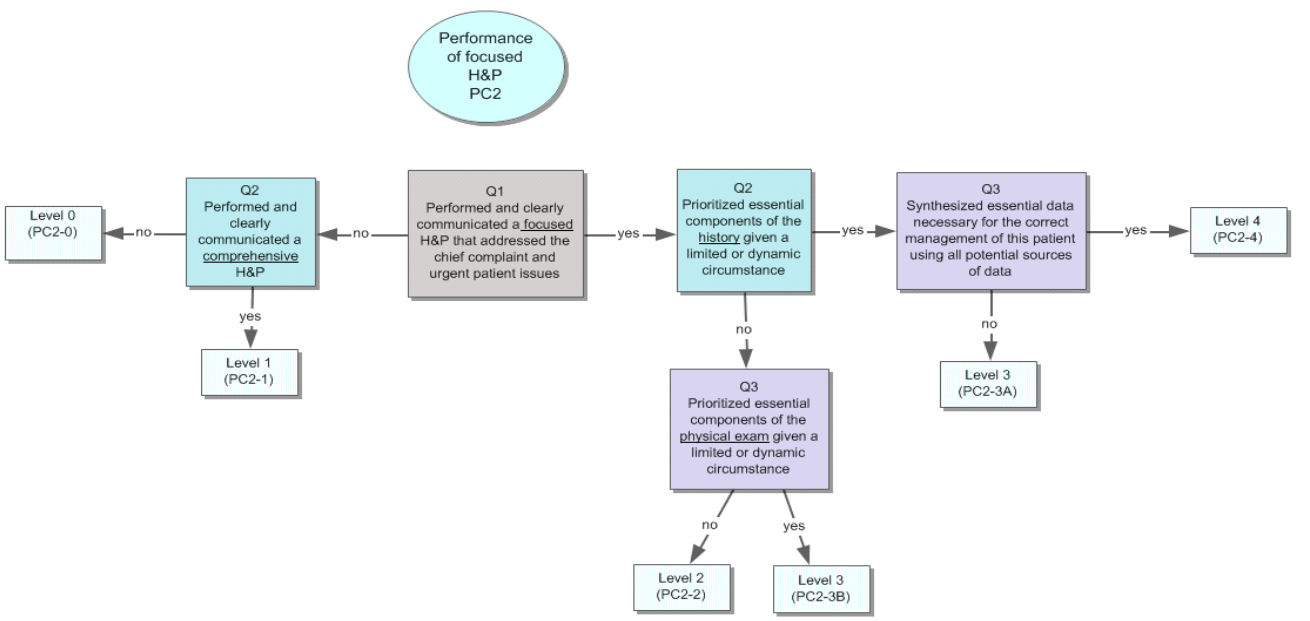


Figure 1.

completed two 4 hour teaching shifts per month with two to four medical students. During these shifts, the expert educator did not have direct patient care responsibilities, focusing solely on student education. For the first three hours, the group focused on clinical care of emergency department patients during which the fourth year students were encouraged to pick up new patients and present them to the teaching attending physician, similar to a conventional shift. Each student was directly observed and assessed by the teaching physician during the patient encounter on a predetermined set of objectives corresponding with ten of the medical student milestones in EM (Table 1). The remaining hour was allotted for direct individual feedback and an informal didactic session, which is in addition to the core medical student lecture series.

Impact/Effectiveness: We have seen an improvement in student perception of our direct observation of competence exercise and have shown the expert educator shift can be effectively used to directly assess ten of the 24 medical student milestones for EM.

89 Can an ECG Elective be Developed that Meets the FAIR Principles?

Shah K, Rodriguez N, Strayer R / Mt. Sinai Medical Center, New York, NY; Elmhurst Hospital Center, New York, NY

Introduction/Background: Learning to interpret electrocardiogram (ECGs) is an important skill for medical students. Emergency physicians are expert in clinical interpretation of ECGs and the emergency setting is an excellent environment to be exposed to a variety of complaints and medical conditions that require ECG interpretation. The challenge is to develop an elective rotation that encompasses all the "FAIR" Principles of effective learning described by Harden and Laidlaw: Feedback, Active Learning, Individualized, and Relevant.

Educational Objectives: To create a successful clinical ECG elective that meets the "FAIR" principles.

Curricular Design: Medical students are taught to interpret ECGs over a 2 week course through the following methods: (1) 10 mini-lectures (30min-1 hour in duration) on ST elevation, bradycardia, ST elevation mimics, syncope, extracardiac manifestation of ECGs, toxicology and electrolytes, wide complex tachycardias, tachydysrhythmias, aortic valve replacement, and pediatric ECGs; (2) "ECG Shifts" where students spend 4 hours reviewing all ECGs performed at triage and present the clinical history and ECG interpretation to an emergency physician; (3) observation in the Cardiac Catherization Lab; (4) participate in two cardiology ECG noon conferences designed for cardiology fellows; (5) self-study. Mini-lectures are given by emergency physicians, pediatric emergency fellows and emergency medicine residents. The course is offered six times per year with a maximum of 6-8 students in each session.

Impact/Effectiveness: Over the course of one year, 40 medical students completed the Clinical ECG Interpretation Course and gave the following average ratings on a scale of 1-5: Feedback 4.30, Active Learning 4.90, Individualized 4.65 and Relevant 4.98. The elective is highly coveted. The course has been 100% filled with at least one person on the waitlist for each session at all times. We have developed a popular and effective ECG elective run completely by emergency physicians.

Table 1. A list of medical student milestones assesed during an expert educator shift.

	Milestone description
1.	Recognizes abnormal vital signs.
2.	Recognizes when a patient is unstable requiring immediate intervention.
4.	Performs and communicates a reliable, comprehensive history and physical exam.
5.	Performs and communicates a focused H&P which effectively addresses the chief complaint and urgent patient issues.
10.	Constructs a list of potential diagnoses based on chief complaint and initial assessment.
11.	Formulates basic diagnostic and therapeutic plans based on a differential diagnosis.
15.	Establishes rapport with and demonstrates empathy toward patients and their families.
18.	Demonstrates behavior that conveys caring, honesty, patient confidentiality, genuine interest and tolerance when interacting with a diverse population of patients and families.
19.	Demonstrates basic professional responsibilities such as timely reporting for duty, appropriate dress, conference attendance, and timely completion of clerkship documents.
21.	Effectively listens and communicates with patients and their families.

H&P, history and physical

90 Cultivating Student Leadership: An Innovative Seminar in Healthcare Management

Wu T, Dibble B, Sharma R / New York University, Bellevue Hospital, New York, NY; NewYork-Presbyterian Hospital-Weill Cornell Medical Center, New York, NY,

Introduction: The need for physician leaders continues to grow. In response, medical schools have expanded the availability of administration related dual degree programs including Master of Business Administration (MBA) and Master of Public Administration (MPA). Students enrolled in these programs often receive very specialized training about policy, business, and management but many programs do not offer a mechanism to integrate this new knowledge with their existing medical training.

Educational Objectives: We developed the Seminar in Healthcare Management for medical students who were pursuing a secondary MBA or MPA degree. The goal of this curriculum was to provide early exposure to physician leaders from a variety of career paths who have integrated administrative, leadership, or policy work with their clinical careers to enable our students to explore future opportunities.

Curricular Design: The Seminar in Healthcare Management was a six month long program with ten participants, eight MD/MBA candidates and two MD/MPA candidates. The curriculum consisted of monthly seminars supported with outside reading assignments and mentorship opportunities. Speakers were industry experts, professors, and clinical administrators from diverse backgrounds. Seminar topics included: Healthcare Delivery Systems, Medical Malpractice and High Risk Medicine, Physician Payment Policy, Physician Leadership, Health Care and Global Supply Chain, and Hospital Organization Community Commitment.

Impact/Effectiveness: The effectiveness of the seminar was assessed using post session surveys. On a scale of 1-5 (1-poor, 5-outstanding), the mean scores were: reading materials (4.61), lecture content (4.45), presentation style (4.57), overall (4.51). With the success of the first year of the program, we have been advocating to incorporate the Seminar in Healthcare Management as a required part of the core MD/MBA and MD/MPA curricula and to expand the program to other dual degree students.

91 Development and Implementation of an Emergency Medicine Podcast for Medical Students: EMIGcast.com

Lichtenheld A, Burgess T, Chapin N, Nomura M, Kornegay J / Oregon Health and Science University, Portland, OR

Background: Asynchronous learning is a rapidly evolving frontier in medical education. Podcasts allow users to access content via the internet and are tools used by many emergency medicine (EM) physicians. Podcasts are also effective for undergraduate medical education, valued for their convenience and portability. Effectiveness of a podcast depends on its relevance to the target audience. While there are numerous podcasts directed at physicians, there are few EM podcasts aimed at the unique objectives of medical students.

Educational Objectives: The objective of this educational innovation is the development of a podcast providing an educational, self-sustaining, student-driven, resource for students interested in EM.

Curricular Design: Portable audio recording equipment and an online blog and data storage platform were purchased with grant funds. Under faculty guidance our group identified EM topics of interest and relevance to medical students. Content experts including faculty, residents, and nurses were invited as guest speakers for student-facilitated interviews. Initial episodes featured topics including: milestones for EM-bound students, the medical student's role on rotation, and the transition from medical student to intern. Future recordings will present toxicological emergencies, medical student's role in a code, and success on the interview trail. Web analytics will be used to track podcast uptake. The website's comments feature will solicit feedback and identify topics for future episodes.

Impact: While EM as a specialty has embraced web-based medical education, there remain few podcasts geared towards students interested in the field. This project extends a teaching modality to an audience already accepting of an asynchronous platform. The podcast will not only be available for students at our institution, but to any student with internet access. We have identified faculty and students dedicated to making this a sustainable product.

92 Fundamentals of Emergency Medicine: A Multimedia Curriculum for the Medical Student Clerkship Using iTunes U

Hess J, Sanderson W / University of Wisconsin School of Medicine and Public Health, Madison, WI

Introduction: Graduate medical education didactics for Emergency Medicine have changed considerably over the past several years, moving away from traditional textbook learning and embracing the #FOAMed revolution. Undergraduate medical education has begun to follow, although a comprehensive, all-in-one solution that can accommodate a variety of learning styles specifically tailored to the medical student has proven difficult to deploy. Existing resources tend to focus on text-based material; the use of audiovisual and other interactive content such as podcasts and video lectures can serve to complement the

existing curriculum and increase retention.

Educational Objectives: This project's objective is to take the core content that a senior medical student is expected to learn and consolidate it into an easy-to-use, all-in-one educational tool that accommodates a variety of individual learning styles.

Curricular Design: The project's design is centered around Apple's iTunes U platform for iOSÂ®. The curriculum is focused around the most common chief complaints and core content expected of the student learner. Each section contains both required and supplemental materials, including video lectures, podcasts, review articles, and reference materials in PDF format. Students independently progress through the curriculum and come prepared for a weekly simulation session that reinforces key concepts learned the week prior.

Impact/Effectiveness: A post-rotation survey indicated that this curriculum was well received, with 92% of students reporting they preferred the iTunes U "Fundamentals" over a textbook-based curriculum. Students rated podcasts and video lectures as the most helpful modalities. The majority of students felt this this curriculum prepared them for clinical shifts in the emergency department. Comments from the survey revealed that students valued the portability and the multiple learning modalities that could be tailored to their individual learning styles.

93 Pre-Clinical Medical Student Simulation for Early Team Leader and Patient Assessment Experience

Noelker J / Washington University in St. Louis, St. Louis, MO

Introduction: Most medical school curriculums limit clinical exposure to the final 2 years of training. Without practical experience on a medical team, it can be difficult for junior medical students to translate their basic science knowledge into patient assessment, or feel at ease discussing care plans in front of a team.

Educational Objectives: The goals of this simulation were to build comfort with assessing patients in front of colleagues as team leaders, and for students to become more familiar with determining whether patients are stable or unstable based on vital sign (VS) evaluation.

Curricular Design: First and second year medical students took turns acting as team leaders in simulated clinical scenarios involving cardiac patients. The 4 cases included atrial fibrillation, pericarditis with tamponade, pulseless electrical activity arrest, and ST segment elevation myocardial infarction. Each case required interpretation of stable and unstable VS, electrocardiogram review, and initiation of basic diagnostic ordering and management. Prior to this session only 22% of student had participated in a real patient resuscitation. None had ever been team leader for either a real or simulated cardiac resuscitation. Pre- and post-session surveys assessed their comfort with patient evaluation in front of peers on a 1-5 scale (1-very comfortable, 5-very uncomfortable), and their perceived ability to assess unstable VS on a scale of 1-3 (definitely, maybe, not at all).

Impact: Before the session 22% rated their comfort with patient evaluation as a 2/5, vs. 88% 3/5, whereas afterwards 12.5% rated 1/5, 62.5% rated 2/5, and only 25% rated 3/5. Perceived VS assessment improved as well: pre-session 88% noted 2/3, while 22% reported a 3/3, while post session 25% 1/3 noted 62.5% 2/3 and only 12.5% 3/3. We conclude that integration of simulated clinical assessment early in the medical school curriculum increases student comfort with leadership and possibly improves basic clinical assessments.

94 Utilizing ACGME Milestones as Evaluation Metrics and SLOE Reporting During a Four Week Fourth Year Emergency Medicine Clerkship: A Two Year Experience

Quinn S, Worrilow C, Yenser D, Jayant D, Johnson S, Bailey B, Eustice E, Kohlhepp J, Rogers R, Kane B / Lehigh Valley Health Network, Bethlahem, PA

Introduction/Background: The Accreditation Council for Graduate Medical Education Milestones presume graduating medical students will enter residency at a Milestone Level 1. At current, the Council of Emergency Medicine Residency Directors standardized letter of evaluation (SLOE) does not specifically assess or communicate the performance by students on an emergency medicine clerkship using the Milestones; however, residency programs must begin assessing residents on the Milestones immediately upon entry.

Educational Objectives: With Institutional Review Board approval, we sought to determine first if an assessment of the milestones could be done during a 4 week 4th year medical student clerkship. If assessable, we then sought to determine the proportion of medical students performing at Milestone Level 1.

Curricular Design: For 2013-2014, we implemented a Milestones-based clerkship assessment and reporting system in our institutional SLOE using our traditional clerkship design and evaluation process. During this phase, for 75 students 55 SLOEs were issued, of which 50 contained our Milestone summary. Deficiencies were noted in Milestones 12 (8) and 14 (3). Review of that data led to redesign of the clerkship and its evaluations for 2014-2015. Figures 1 and 2 note our iterative changes. On-shift assessment forms include anchors Occasionally (>60%), Usually (>80%) and Always (100%) at points 1,

Milestone	Primary Means of Assessment	Year Two Revisions
Emergency Stabilization (PC1)	On shift evaluation	Students required to overtly report abnormal vital signs to faculty
History and Physical (PC2)	On shift evaluation	
Diagnostic Studies (PC3)	On shift evaluation	
Differential Diagnosis (PC4)	On shift evaluation	Students required to present minimum 5 part differential to faculty
Pharmacology (PC5)	On shift evaluation	Students required to present drug allergies prior to suggested therapy
Observation/Reassessment (PC 6)	On shift evaluation	Students required to re-evaluate their patients hourly and provide an update to the faculty
Disposition (PC 7)	Nursing shift	Students locate critical equipment on nursing shift
Task-switching (PC 8)	On shift evaluation	
Gen Approach to Procedures (PC9)	Procedure Consult™ quizzes, Student's Procedure Recorder	Faculty attest to use of universal precautions in procedure recorder
Airway Management (PC10)	Simulation Lab, Procedure Consult ™ quizzes	Cases changes to emphasize BVM (bag/valve/mask)
Anesthesia, Pain Management (PC 11)	Procedure Lab, Procedure Consult ™ quizzes, In house quiz, Procedure recorder	Addition to in house quiz. Faculty attest to use of local anesthesia in procedure recorder

Figure 1. Milestones #1-11 iterative changes and means of assessment.

Ultrasound (PC 12)	Ultrasound lecture, Procedure Recorder	Faculty attest to use of ultrasound on shift in procedure recorder
Wound Management (PC 13)	Procedure Lab, Procedure Consult ™ quizzes. Procedure recorder	Students required to repair 1 laceration on shift. Addition repairs considered for improved grade
Vascular Access (PC 14)	Simulation Lab, Procedure Consult ™ quizzes. Procedure recorder, Nursing Shift	Addition of femoral stick to simulation lab case
Medical Knowledge (MK1)	Not assessed for SLOE	SAEM test score included, but level one status not indicated with this instrument
Patient Safety (SBP 1)	IHI Open School	IHI module requirement added
Process Improvement (SBP 2)	Automatically passed	As written, we presume students can identify members of a health care team
Technology	Partially assessed. Students cannot participate in our EMR	Medicine reconciliation added to nursing shift
Practice Based Improvement (PBL1)	Participation in Fresno Test of EBM Based Two Hour Workshop	
Professionalism (PR1)	On shift evaluation	
Accountability (PR 2)	Completion of assignments. Social media anchor not assessed	A revised checklist records asynchronous assignment completion
Patient Centered Communication (ICS 1)	On shift evaluation	
Team Management (ICS 2)	On shift evaluation	

Figure 2. Milestones #12-23 iterative changes and means of assessment.

3, and 5 of a Likert Scale. Students are deemed proficient with an average of >80% on Milestones measured on shift. Milestones not evaluated on-shift were graded as Pass/Fail. Faculty were educated about the changes, and fliers were posted in the emergency department.

Impact/Effectiveness: This year 49 students rotated. 575 on-shift evaluations were completed, with 16 Milestones deficiencies noted. Of 41 SLOEs, 1 noted deficiencies in Milestones 2, 3, 4, 5, and 8. Communication of Milestone proficiency via the SLOE may identify students who will require early observation or remediation. In our system, however, even with increased rigor of assessment, we find that assessment with the Milestones does not adequately differentiate students.

Educational Soundbites Oral Presentations

95 Creating Clarity for the Process of Managing Residents through Remediation, Probation and Termination

Murano T, Lypson M, Smith J, Silverberg M, Weizberg M, Lukela M, Santen S / Rutgers New Jersey Medical School, Newark, NJ; University of Michigan School of Medicine, Ann Arbor, MI; Alpert Medical School of Brown University, Providence, RI; SUNY Downstate/ Kings County Hospital, Brooklyn, NY; Staten Island University Hospital, Staten Island, NY

Introduction: Our recent study on resident remediation demonstrated that most emergency medicine program directors (PDs) recognize formal remediation as a resident status, but there is still much variation regarding the triggers for remediation, probation and termination (RPT), as well as the processes and documentation for these residents.

Educational Objectives: To create a clear framework for PDs to manage residents who need RPT.

Curricular Design: Through consensus, a team of graduate medical education leaders, including PDs in multiple specialties, developed the framework below for struggling residents. We focused on the definition, process of management, documentation, and notification for each category describing residents in RPT (Table 1).

1. Informal remediation: when a resident's performance is deficient in one or more milestones or competencies. Process: Initiate when there are warning signs of problems that are not significant enough to trigger formal remediation.
2. Formal remediation: when deficiencies are significant enough to warrant formal documentation because informal remediation failed or because the issues are substantial. Process: Initiate when the resident fails to correct the identified deficiency in the designated observation period, or substantial deficiencies are identified.
3. Probation: when resident is unsuccessful in meeting the terms of formal remediation or if initial problems are so significant to warrant immediate probation. Process: Initiate when the resident fails to correct the deficiency in formal remediation in the designated observation period.
4. Termination: when a resident is unsuccessful in meeting the terms of probation or if initial problems are so significant to warrant immediate termination. Process: initiate when probation is not successful.

Impact: We propose a consensus framework for RPT. The impact will be clarity surrounding RPT, and to provide guidance for PDs, residents, and post-graduate employers.

Table 1. Description of documentation and notifications for remediation, probation, and termination.

	Informal remediation	Formal remediation	Probation	Termination
Documentation	*Usual documentation of strengths and weaknesses of resident *Important to document in case resident fails to course correct *No formal letter in permanent resident file, there may be some documentation of the discussion	*Document the failed informal remediation process, an updated corrective plan with expected outcomes, and the time frame for expected correction *Formal letter to the resident from PD *Resident signature acknowledging receipt and understanding *Documentaion is maintained in permanent file	Document the failed formal remediation process, and update the expected outcomes and time frame *Formal letter to the resident from PD *Resident signature acknowledging receipt and understanding *Documentation is maintianed in permanent file	Document the failed remediation and failed probation
Notification	None	Notify the GME office in accordance with institutional guidelines *Final verification and letters of recommendation-up to the discretion of PD whether it is mentioned	*Notify the GME office *Include probation status in letters of recommendation and in the final verification of training	Notification of GME office and legal office *Include termination status in letters of recommendation and the verification of training

GME, graduate medical education; *PD,* program director

96 Creation and Implementation of an Online Teaching Resource: The Northwestern Emergency Medicine Model in Orthopedics Education

Burns W, Elsaesser T, Levine M / Northwestern University, Chicago, IL

Introduction: Orthopedics, a core competency of emergency medicine (EM) education, is traditionally taught through textbooks and clinical exposure. As textbooks are expensive and lack portability, and clinical exposure can be variable, we recognized the need for a free, mobile, and complete review of orthopedics topics for EM residents.

Educational Objectives: We describe the creation, dissemination, and sustainment of an asynchronous online teaching tool using resources available to any residency program.

Curricular Design: Orthopedic cases with educational merit were sought from a single emergency department. Important uncommon and core common cases were identified and securely recorded. EM residents selected images from this list and added teaching material to compose didactic cases using a standardized template. Edited cases, original videos and lessons were uploaded to a project website (http://ortho-teaching.feinberg.northwestern.edu/) (Figure 1) for use as a portion of the orthopedics curriculum. It was also made freely accessible for external use by other medical professionals.

Impact: This free, open access, education resource was created using technology and human resources available to any residency program. It has been sustained since publication

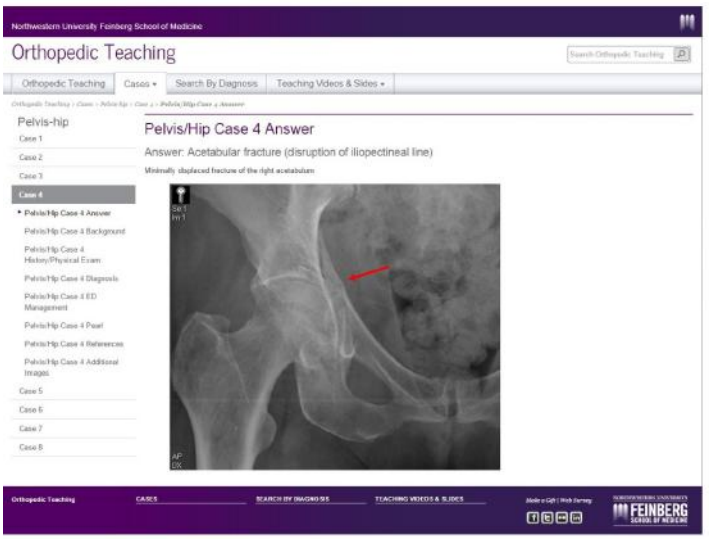
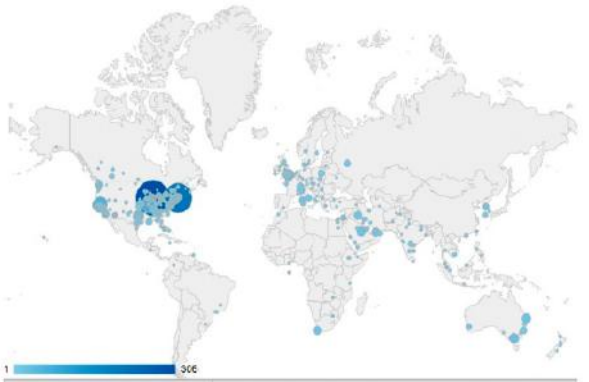


Figure 1.

by residents with negligible cost. Currently there are 104 cases, 8 lessons and 26 videos available. Data regarding use of the website has been gathered since June 2014. There have been 2,143 website sessions and 1,405 unique users. Cities with the highest use: Chicago, IL (14%), Providence, RI (10%), and St. Louis, MO (3%); countries: US (69%), UK (5%) and Australia (3%) with use extending across Europe, Middle East and Asia (Figure 2). It is used as asynchronous material for our orthopedics module, implemented into the curriculum at other institutions, and was cited as a favorite website in EM education at Council of Emergency Medicine Residency Directors in 2011. This model can serve as a guide to create similar web-based resources that can be widely disseminated as a teaching tool and reference.



City	Acquisition		
	Sessions ↓	% New Sessions	New Users
	2,143 % of Total: 100.00% (2,143)	65.24% Site Avg: 65.19% (0.07%)	1,398 % of Total: 100.07% (1,397)
1. Chicago	306 (14.28%)	62.75%	192 (13.73%)
2. Providence	214 (9.99%)	59.81%	128 (9.16%)
3. St. Louis	70 (3.27%)	41.43%	29 (2.07%)
4. Sacramento	62 (2.89%)	27.42%	17 (1.22%)
5. London	53 (2.47%)	41.51%	22 (1.57%)
6. (not set)	48 (2.24%)	70.83%	34 (2.43%)
7. Farmers Branch	30 (1.40%)	90.00%	27 (1.93%)
8. New York	28 (1.31%)	92.86%	26 (1.86%)
9. Milford	26 (1.21%)	3.85%	1 (0.07%)
10. Melbourne	24 (1.12%)	66.67%	16 (1.14%)

Figure 2.

97 Disparities in Pain Management: An Educational Intervention Using the Implicit Association Test

Siegelman J, Woods C, Oyewo A, Salhi B, Bryant A, Heron S / Emory University, Atlanta, GA

Background: Disparities in healthcare delivery persist despite decades of work towards racial equality. Multiple emergency medicine (EM) milestones address cultural competency, including Professional Values and Patient Centered Communication. The practice of EM often relies on instinctive, task-oriented critical actions that potentially are subject to unconscious, inherent bias, often without explicitly outlined guidelines.

Objectives: 1) Analyze implicit bias in clinical practice including in analgesic selection, and, 2) Discuss strategies for mitigating the effects of implicit bias in the emergency department (ED).

Curricular Design: 57 residents at a large, urban EM training facility were given a 5 minute introductory lecture on the Implicit Association Test (IAT), a tool that assesses for unconscious bias. They were subsequently sent a link to complete the Race IAT. At the annual retreat, residents were presented with eight cases and asked to select an analgesic for various scenarios of chronic and acute presentations to the ED, with matched scenarios for patients of each race. Residents were anonymously asked in real time to report their preferred pain management strategy: no medication, non-narcotic, or narcotic analgesics using Poll Everywhere. A one-hour facilitated discussion followed.

Impact: For a chronic pain scenario, 11/30 (37%) residents reported they would use opioid analgesics as first-line agents in the management of the Black patient compared to 24/33 (73%) for the case-matched White patient. No statistical difference was observed in the management of acute pain cases for either Black or White patients. 19/31 (61%) resident respondents reported that this activity would increase their awareness and influence their practice pattern. An EM-based curriculum on diversity, inclusion, and cultural competence using the IAT can increase awareness of unconscious racial bias among EM residents with regard to pain management.

98 Easing the July Transition: The Use of In-situ Scenarios to Teach and Assess Non-Technical Skills

Krzyzaniak S, Barker L, Nadir N / University of Illinois College of Medicine at Peoria/OSF Saint Francis Medical Center, Peoria, IL

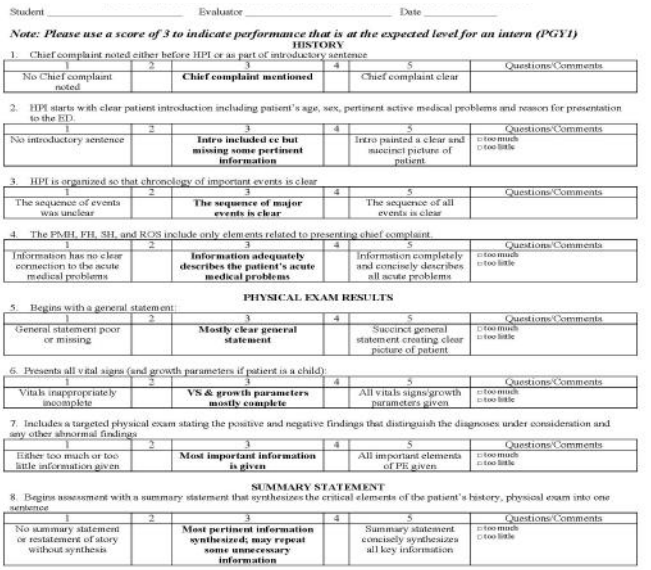
Background: In our experience, emergency medicine (EM) interns enter with varying levels of preparedness. During intern orientation, lecture-based didactics address medical knowledge however data-synthesis and interpersonal and communication skills (ICS) are also required for success in the emergency department (ED).

Objectives: 1) Assess interns' baseline performance in ICS, data acquisition and synthesis, presentations, and consultant communications 2) Provide formative feedback to learners on their performance 3) Identify interns with deficiencies in these skills.

Design: A task force identified skills necessary for early success in our ED: clinical data acquisition and synthesis, presentation skills, and ICS. An in-situ series of standardized patient (SP) encounters was developed to replicate a "day in the life" of an EM intern. Three cases were created: abdominal pain, dyspnea and chest pain. Interns obtained histories and physicals and presented to faculty. ICS feedback was provided by SPs while faculty gave feedback on presentations. Interns were then prompted to call relevant consulting services. Faculty received these calls and provided feedback. Previously validated tools guided assessment and feedback for all components, though the presentation assessment tool was modified for the ED setting (Figure 1). Faculty then assigned each intern a global rating. Intern feedback was also solicited.

Impact: Intern feedback indicated the event

provided good preparation for clinical practice, though areas for refinement were identified (Table 1). The global performance of 4 interns was identified as below expectations, allowing these individuals to be targeted for early intervention. At least 35% of encounters received low ICS scores in interest, discussion and sensitivity. Interns also consistently missed 2 items from the 5C model for consultations: training level identification and plan "read back". These provide an opportunity to focus future educational efforts.



Student _____ Evaluator _____ Date _____

Note: Please use a score of 3 to indicate performance that is at the expected level for an intern (PGY1)

HISTORY

1. Chief complaint noted either before HPI or as part of introductory sentence

1	2	3	4	5	Questions/Comments
No Chief complaint noted		**Chief complaint mentioned**		Chief complaint clear	

2. HPI starts with clear patient introduction including patient's age, sex, pertinent active medical problems and reason for presentation to the ED.

1	2	3	4	5	Questions/Comments
No introductory sentence		**Intro included cc but missing some pertinent information**		Intro painted a clear and succinct picture of patient	□too much □too little

3. HPI is organized so that chronology of important events is clear

1	2	3	4	5	Questions/Comments
The sequence of events was unclear		**The sequence of major events is clear**		The sequence of all events is clear	

4. The PMH, FH, SH, and ROS include only elements related to presenting chief complaint.

1	2	3	4	5	Questions/Comments
Information has no clear connection to the acute medical problems		**Information adequately describes the patient's acute medical problems**		Information completely and concisely describes all acute problems	□too much □too little

PHYSICAL EXAM RESULTS

5. Begins with a general statement:

1	2	3	4	5	Questions/Comments
General statement poor or missing		**Mostly clear general statement**		Succinct general statement creating clear picture of patient	□too much □too little

6. Presents all vital signs (and growth parameters if patient is a child):

1	2	3	4	5	Questions/Comments
Vitals inappropriately incomplete		**VS & growth parameters mostly complete**		All vitals signs/growth parameters given	□too much □too little

7. Includes a targeted physical exam stating the positive and negative findings that distinguish the diagnoses under consideration and any other abnormal findings

1	2	3	4	5	Questions/Comments
Either too much or too little information given		**Most important information is given**		All important elements of PE given	□too much □too little

SUMMARY STATEMENT

8. Begins assessment with a summary statement that synthesizes the critical elements of the patient's history, physical exam into one sentence

1	2	3	4	5	Questions/Comments
No summary statement or restatement of story without synthesis		**Most pertinent information synthesized; may repeat some unnecessary information**		Summary statement concisely synthesizes all key information	□too much □too little

Figure 1. Emergency medicine patient presentation rating tool. *PGY*, post-graduate year; *ED*, emergency department;

Table 2. DITL Evaluation. Average scores based on 5 point Likert Scale (1:Stongly Disagree and 5 Strongly Agree) and learner comments for improvement

Survey Item	Average Score
1) Allowed me to practice my H and P presentation skills	4.27
2) Allowed me to practice my consultation communication skills	4.64
3) Allowed me to practice my documentation and charting skills	3.73
4) Helped me identify areas of improvement with respect to my presentation skills	4.09
5) Helped me identify areas of improvement with respect to my communication skills	4.27
6) Helped me identify areas of improvement with respect to my charting skills	3.64
7) Has been useful in developing my history and physical presentation skills	3.91
8) Has been useful in developing my consultation communication skills	4.45
9) Has been useful in developing my charting skills.	3.64
10) Was useful in preparing me for my day to day role as an EM Intern.	4.00
11) Was pertinent and relevant to my intern orientation	4.18
12) Was pertinent and relevant for my overall resident education	4.18
13) Will be useful to repeat for next years intern orientation	4.27
14) Needs to be revamped before next years orientation* (suggestions below)	2.82

"More guidance on documentation and review of our notes"

"I like the phone consultant I would keep that"

"1.) Standardized patients should be more familiar with prompts to questioning to divulge information which any reasonable patient would give. When i ask an open ended question about "what's going on" on "what lung problems do you have," you would expect the patient to at least say "I've been coughing." 2.) Vitals and patient name should be provided before entering every patient room, so that proper rapport can be simulated/established 3.) Grading sheet should be provided the day before or week before to aid as a study tool for things we should be covering for any H&P, not just for the exam but for real practice."

"I think it was great I couldn't have asked for better preparation it would have been nice to have done it slightly sooner but not before I have worked a shift."

"I really liked the consultation and H&P presentation aspect. I still remember a lot of the key points that we discussed on that day when practicing. Having more opportunities to consult would be good because I know that it takes repetition for me to be comfortable talking with other attendings on other services."

"More time going over notes would be helpful to set expectations for notes."

Figure 2. DITL Evaluation. Average scores based on 5 point Likert Scale (1:Strongly Disagree and 5:Strongly Agree) and learner comments for improvement.

99 Integration of a Blog into the Emergency Medicine Residency Curriculum

Khadpe J, Willis J, Silverberg M, Grock A, Smith T / SUNY Downstate Medical Center, Brooklyn, NY

Introduction: In 2012, "The Original Kings of County" (TOKC) blog was launched in an effort to integrate the principles of Free Open Access Meducation (FOAM) into the State University of New York (SUNY) Downstate emergency medicine (EM) residency program. The Council of Emergency Medicine Residency Directors (CORD) Social Media Task Force published its guidelines, best practices and recommendations for integrating social media into EM residency programs in 2014, demonstrating a need for the creation of such educational resources.

Objectives:

1. Demonstrate the integration of the didactic activities of a large urban EM residency program into a residency-based blog.
2. Increase resident engagement in their didactics through the use of a residency blog.
3. Develop residents' skills with respect to education and scholarship through authorship for a residency blog.

Design: The TOKC blog was implemented to create an online hub for the integration of the principles of Web 2.0 into the curriculum at the SUNY Downstate EM residency program. It has 3 goals that drive content for the blog posts. The first is to post educational content regarding didactics within the program for residents who are unable to attend these activities. The second is to engage residents through their own authorship of blog posts on topics of interest while aiding them to develop

Figure 1.

an academic niche. The third is to attract and encourage participation in the blog through contests using clinical cases. This 3-prong approach creates a comprehensive online didactic presence that embraces the principles of FOAM.

Impact: As of December 1, 2014, TOKC has generated over 500 posts by more than 20 resident and faculty authors and receives more than 100 page views per day. This provides our program a platform to share their scholarship with a local, national, and international community. Additionally, TOKC was referenced in the article, "Integration of Social Media in Emergency Medicine Residency Curriculum," by Scott et al. published in Annals of Emergency Medicine.

Lightning Oral Presentations

100 Characterizing Resident and Faculty Evaluation of Medical Students Using a Mock Medical Student Patient Presentation Video

Primeau K, Hiller K, Ng V, Plitt J, Wilson B, Gokova O / University of Arizona College of Medicine, Tucson, AZ

Background: Evaluation of medical students in emergency medicine (EM) clerkships has a large impact on grades, career interests, and residency match success. Although these evaluations are important, little data exists on the variance of assessment. EM necessitates evaluation based on different clinical scenarios and by different evaluators. Standardization of the scenario and information given to evaluators may make it possible to describe the range of error in evaluation attributable to the evaluator.

Objectives: To describe the variation in medical student evaluation by residents and faculty using a mock medical student patient presentation.

To identify changes in evaluation practice after an interventional session about best practices in evaluation.

Methods: In this single institution prospective cohort study, a 3-minute video of a mock medical student patient presentation was shown to EM residents and faculty during a weekly academic conference. Evaluators completed the end-of-shift evaluation currently in use by the EM clerkship. The evaluation consists of 5 point likert scales in the domains of energy and interest, medical knowledge, judgment and problem solving, clinical skills, personal effectiveness, and systems-based practice. Next, a one-hour lecture on best practices in evaluation was given by the clerkship director and medical education specialists. Evaluators then watched the same video and completed the same evaluation. Paired t-tests were performed on pre- and post-lecture evaluations for each domain.

Results: 24 physicians completed the surveys. For all domains, responses ranged from "below expectations" (2) to "far above expectations" (5). The pre- and post-intervention paired comparisons of means are displayed in Table 1.

Conclusions: There is a large variation in evaluator assessment of student performance even when the student presentation is held constant. A one-hour session on evaluation best practices did not change quantitative scoring of a mock presentation.

101 Comparison of Manual Versus Automated Procedure Logging for Emergency Medicine Residents

Leventhal E, Bodkin R / Harvard University BIDMC, Boston, MA; University of Rochester Medical School/ Strong Memorial Hospital, Rochester, NY

Background: Documentation of procedural competency is a standard in graduate medical education (GME). Manual procedure logging is inefficient, time consuming, and requires duplication of work, reliance on this process fraught with potential inaccuracies.

Objectives: Determine if development of an automated procedure logging system would increase compliance and accuracy of emergency medicine (EM) resident procedure tracking. Determine amount of time, which could be saved using an automated system. It is believed that an automated system would increase accuracy of procedure logging and save time.

Methods: A retrospective chart review was performed of procedures documented in the electronic medical record (EMR) and compared to those which were manually logged by residents. All patients who presented to Strong Memorial emergency department during two academic years (6/24/11-6/20/13), who

Table 1. Pre- and post-intervention evaluation scores by domain assessed.

Domain assessed	Pre-intervention mean (SD)	Post-intervention mean (SD)	*p*-value
Energy/interest	3.85 (0.85)	3.70 (0.76)	0.23
Medical knowledge	4.17 (0.78)	3.96 (0.88)	0.28
Judgment/problem solving	4.09 (0.85)	3.96 (0.77)	0.52
Clinical skills	3.96 (0.88)	3.65 (0.93)	0.13
Personal effectiveness	4.05 (0.80)	3.67 (0.91)	0.07
Systems-based practice	3.75 (0.85)	3.45 (0.76)	0.23
Overall evaluation mean	3.98 (0.71)	3.76 (0.67)	0.18

had a resident review committee required procedure documented by an EM resident were included. Data was extracted from our EMR (Epic) using a customized query. All procedures are logged using E-Value (EV) and, prior to 2/13, on New Innovations (NI). Data was extracted from both EV and NI. Data matching was performed between the extracted data. Records were matched on: medical record number, age, date of service, procedure, and supervising physician. Primary outcomes evaluated the total number of procedures performed in the EMR compared to those documented in EV/NI using descriptive statistics and paired Student's t-test.

Results: Total number of procedures extracted by the system was: EMR 11,173, EV 5,592, and NI 10,518. Matches between EMR and NE/EV were found for 3,444 procedures.

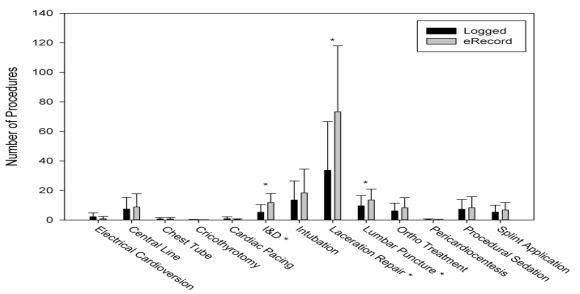


Figure 1. Significantly more I&D, laceration repairs and lumbar punctures were documented in the EMR than were logged by residents (*indicates significant differences p<0.05).

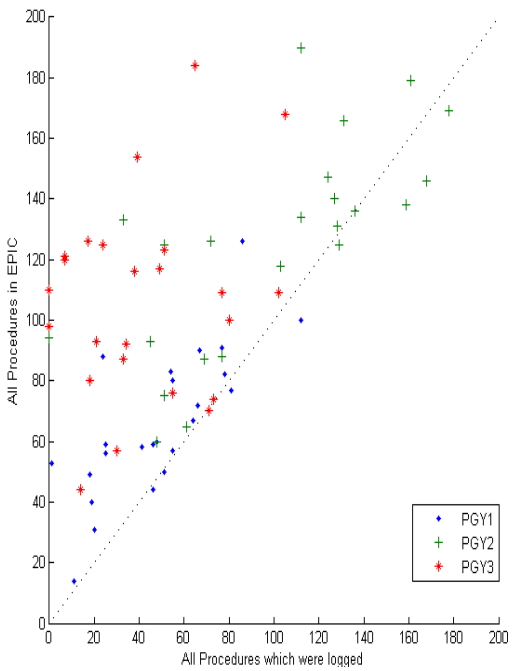


Figure 2. Postgraduate year-3 (PGY-3) senior residents trended towards logging fewer procedures, while the PGY2 trended towards logging the most procedures during the most procedure intensive year. Across all classes, there was a trend towards having more procedures documented in the EMR than was logged. *EMR*, electronic medical record

More procedures per resident year were recorded in the EMR (151Â±91) than in NI/EV (92 Â±73, p<0.01). On average, it takes a resident 39-215 sec to log a procedure, accounting for 61-334 hrs/year; and an attending 15 sec to attest to each procedure, accounting for 23 hrs/year.

Conclusions: Residents are not logging all procedures. An automated system would increases accuracy and compliance, as well as save time of both residents and faculty.

102 Institutional Risk of Social Media Utilization by Emergency Medicine Residents and Faculty

Garg M, Pearson D, Bond M, Runyon M, Kegg J, Pillow T, Cooney R / Temple University, Philadelphia, PA; Carolinas Medical Center, Charlotte, NC; University of Maryland, Baltimore, MD; Southern Illinois University, Springfield, IL; Baylor College of Medicine, Houston, TX; Conemaugh Memorial Medical Center, Johnstown, PA

Background: The use of social media (SM) platforms in emergency medicine (EM) residency training programs continues to increase. Residents and faculty may be unaware of their personal SM use causing unintended risk to the institution.

Objective: We sought to identify frequency and differences of observed SM behavior with potential institutional risk between EM residents and faculty.

Methods: This is a multi-site 18-question survey study administered via the online tool SurveyMonkey© by e-mail to the residents and faculty in 14 EM programs and the Council of Emergency Medicine Residency Directors (CORD) listserv. Faculty and resident responses were compared using the chi square or Fisher's exact test. Results: There were 1,314 total responses (63% male, 36% female; 40% age <30 years, 39% ages 31 to 40, and 21% age >40) with 772 residents and 542 faculty [15% Program Directors (PDs), 85% other faculty]. The percentage of PDs noting non-resident peers/colleagues posting at least once a year: identifiable patient information (46%), radiograph/clinical picture or other image (63%), and items leading to termination or reprimand (30%). The percentage of PDs reporting similar posts by residents were 45%, 58%, and 22% respectfully. The percentage of residents noting peers/colleagues posting at least once a year: identifiable patient information (26%), and a radiograph/clinical picture/other image (52%). Non-resident peers/colleagues were more likely to post identifiable patient information compared to residents (p=0.0004). Non-resident peers/colleagues were as likely to post a radiograph/clinical picture or other image compared to residents (p=0.12).

Conclusion: EM faculty and residents self-report frequent colleague posting of patient identifiable information and are unaware of the institutional risk with use of SM that can lead to termination or reprimand. Awareness of institutional risk should prompt responsible SM utilization and use of CORD's social media guidelines developed by the Social Media Committee.