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 2014. 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 Directors Board, Michelle Parker, and Dr. Michael Epter for helping to make this collaborative special issue possible.

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1 Backstage at the Emergency Medicine Match

Finan M, Jeanmonod R/St. Luke's University Hospital, Bethlehem, PA

Objectives: There is little data on which criteria are used by EM program directors (PDs) when selecting candidates for interview or when ranking candidate's. We investigate which parts of the candidate's application are most important to secure an interview and a spot on the rank list.

Methods: This is a cross-sectional study of PDs in ACGME approved EM programs in 2012-2013. Our study looked at 14 criteria from the candidate application. PDs ranked all 14 criteria in order of importance when inviting candidates for interviews. They then ranked the same criteria in formulating their rank list. The study was IRB exempt.

Results: 51 PDs returned surveys, with all areas of the country represented (New England, Mid-Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, Pacific). For the purposes of interview invitation, 40 programs ranked "letters of recommendation (LORs)," 31 ranked "emergency medicine rotation grade," and 19 ranked "USMLE step 2 score" as one of the three top factors. "Candidate participating in couple's match," "citizenship status," and "contribution to gender/racial diversity" were ranked as the three least important factors in extending interviews to candidates by 37, 26, and 24 programs respectively.

In formulating the rank order list, 44 programs chose "interview performance," 32 chose "LORs," and 26 selected "emergency medicine rotation grade" as one of the top three criteria. "Candidate participating in couple's match," "contribution to diversity," "extracurricular activities" and "presence of research publications" were ranked as the three least important criteria (with 29, 25, 23, and 23 PDs choosing these, respectively).

Conclusions: PDs consistently placed a high value on LORs and EM rotation grades when choosing interviewees. Once selected to interview, the most important factor in determining location on the final rank list is interview performance.

2 Behaviors and Characteristics of Exemplary Emergency Physicians

Nazario S, Spruill T, Birenbaum D /Florida Hospital, Orlando, FL

Background: Since the ACGME implemented the general competencies for resident development in 2002, educators have documented evidence of their graduates- basic skills in each of the six categories. To surpass competence and facilitate excellence, it is necessary to identify which physician behaviors contribute most to that end point. To date, no attempt has been made to identify the behaviors and characteristics of exemplary EM physicians.

Objectives: The study's purpose was to identify specific behaviors causing emergency physicians to be judged as exemplary (by their peers as well a cohort of 4th year med students about to begin EM residency training). The use of two cohorts allowed for additional analysis of any differences between those early versus more advanced in their career.

Methods: An act-frequency questionnaire was used in which 131 subjects were instructed to think of 1-3 exemplary emergency physicians whom they have directly observed. They were asked to list behaviors that they had personally observed the role models exhibit, while engaged in their duties that were perceived as exemplary. They were also asked to identify negative behaviors observed in other dysfunctional emergency physicians that were absent from their role models' behaviors.

Results: After 6 independent judges sorted responses into the six general competencies the following ranking occurred: 1) Interpersonal/Communication Skills, 2) Professionalism, 3) Patient Care, 4) Practice-based learning, 5) Medical Knowledge, and 6) Systems-based Practice. Within the EM-specific competency sub-categories rank ordering was also done. Some subtle differences were also noted between those about to enter residency training and experienced EM physicians.

Conclusions: Interpersonal and professionalism skills accounted for 75% of the total behaviors listed by both cohorts, suggesting that training exemplary physicians will require a strong emphasis on facilitating these specific behavior sets.

3 Council of Emergency Medicine Residency Directors Standardized Letter of Evaluation: Program Director's Perspective

Love JN, Smith J, Weizberg M, Doty C, Garra G, Avegno J, Howell JM/Georgetown University Hospital Washington Hospital Center, Dayton, MD; Rhode Island Hospital, Providence, RI; Staten Island University Hospital, Staten Island, NY; University of Kentucky Hospital, Lexington, KY; Stony Brook University Hospital, Stony Brook, NY; LSU New Orleans, New Orleans. LA; INOVA Fairfax Hospital, Falls Church, VA

Objectives: The Standardized Letter of Evaluation (SLOE) was created in 1997 to provide Program Directors (PDs) with a summative evaluation that incorporates normative grading. Though the SLOE has become increasingly popular and important in decision making, it has not been studied in the past 12 years. In order to assess the SLOEs effectiveness and limitations, the perspective of EM PDs was surveyed.

Methods: After validation of the survey by 10 retired PDs, a questionnaire was sent to each PD of the 159 EM

residencies that existed at that time. The survey was circulated via the CORD listserv from January 24th, 2013 to February 13th, 2013.

Results: One hundred and fifty of 159 PDs (94.3%) completed the questionnaire. Nearly all respondents (99.3%: 149/150)agreed that the SLOR is an important evaluative tool and should continue to be used. In the application process, 60.7% (91/150) of programs require 1 or more SLOEs and an additional 36.7% (55/150) recommend but do not require a SLOE to be considered for interview. When asked to identify the top three factors when deciding who should be interviewed, the SLOE was ranked first (92.7%: 139/150) with EM rotation grades ranked second (48.7%: 73/150). The three most common factors identified that diminished the value of the SLOE in order of the number of responses were (1) Inflated evaluations (88.4%: 129/146), (2) Inconsistency between comments and grades (79.5%: 116/146), (3) Inadequate perspective on candidate attributes in the written comments (52.7%: 77/146)and inexperienced letter writers (52.7%: 77/146).

Conclusions: The SLOE is the most important tool in the EM PDs armamentarium for determining which candidates should be interviewed for residency training. The SLOEs potential utility is hampered by a number of factors, most important of which is inflated evaluations. Focused changes in the SLOE template should be mindful that it appears, in general, to be successful in its intended purpose.

4 Interactive Case Discussion is Superior to Lecture in Clinical Case Presentation for Resident Learning in Emergency Medicine

Sheng AY, Eicken J, Horton CL, Nadel E, Takayesu JK/ Massachusetts General Hospital, Boston, MA; Brigham and Women's Hospital, Boston, MA

Background: Follow-up case presentation (FCP), a staple part of conference education curriculum in emergency medicine residencies, has traditionally been delivered using PowerPoint (PP). Sole use of PP lecture format limits active audience participation and can induce learner fatigue, boredom, and information overload. In light of literature supporting chalk board and morning report formats, we changed FCP to an interactive chalkboard format with limited PP slides. We hypothesized that this change will enhance learners' perceived educational impact of FCP.

Objective: To identify the optimal format to deliver FCPs by examining emergency medicine residents' perceived

Table 1. Questionnaire completion rate per PGY level.

PGY level	Group		
Frequency Percentage	Pre	Post	Total
1	12 24.00	9 23.08	21
2	15 30.00	14 35.90	29
3	12 24.00	11 28.21	23
4	11 22.00	5 12.82	16
Total	50	39	89

Table 2. Comparison of pre and post-intervention responses.

Questions: How effective do you perceive follow-up case conference to be at…		Pre	Post	p-value
…educating you regarding the topics covered?	Mean	3.5	4.0	0.003
	Std Dev	0.8	0.6	
	Median	4.0	4.0	
…teaching you practical knowledge that you can apply on your upcoming shift?	Mean	3.4	3.8	0.014
	Std Dev	0.8	0.6	
	Median	4.0	4.0	
…stimulating you to assess your own knowledge about the topic being covered?	Mean	3.4	3.8	0.023
	Std Dev	0.9	0.6	
	Median	4.0	4.0	
…motivating you to read more on the topic being covered?	Mean	2.9	3.2	0.12
	Std Dev	1.0	0.7	
	Median	3.0	3.0	
…encouraging you to actively generate a broad differential diagnosis for the patient's presentation?	Mean	3.4	3.9	0.008
	Std Dev	0.8	0.8	
	Median	4.0	4.0	
…promoting an interactive learning environment that fosters group discussion?	Mean	3.1	4.1	<0.0001
	Std Dev	1.0	0.8	
	Median	3.0	4.0	
How often have you altered your management of a patient after learning about a related topic during follow-up case conference in its current format?	Mean	2.6	2.7	0.68
	Std Dev	0.7	0.8	
	Median	3.0	3.0	
Are you looking forward to attending the next follow-up case conference in its current format?	Mean	1.3	1.2	0.054
	Std Dev	0.5	0.4	
	Median	1.0	1.0	
How many hours did you spend in preparing for your presentation?	Median	8.0	5.0	0.05
	Q1	4.5	3.0	
	Q3	10.0	8.0	
Through the process of preparing your presentation, what level of expertise have you developed on the topic?	Mean	4.1	4.1	0.70
	Std Dev	0.5	0.8	
	Median	4.0	4.0	

educational impact of PP lecture compared to interactive chalkboard formats.

Methods: Design: Time series investigation with pre- and post-intervention questionnaires.

Setting: Harvard Affiliated Emergency Medicine Residency (HAEMR) didactic conference education curriculum.

Subjects: 60 HAEMR emergency medicine residents (PGY 1-4).

Observations: Questionnaires using 5-point Likert scales were used to measure residents' attitudes and perception of the FCPs before and after the intervention of changing from a PP lecture to interactive chalkboard formats. The questionnaires were compared using Mantel-Haenszel chi-square tests.

Results: Pre- and post-intervention questionnaire completion rates were 83.3% (50/60) and 65% (39/60), respectively. FCPs using chalkboard format were perceived by learners to be significantly more effective than traditional PP lecture-based FCPs at knowledge transfer, teaching practical knowledge, stimulating self-knowledge assessment, encouraging the generation of broad differential diagnoses, and promoting an interactive learning environment that fosters group discussion.

Conclusions: Implementation of a chalkboard format with interactive learner discussion is perceived by learners to be the superior didactic educational medium compared to exclusive use of PP lecture for FCPs.

5 Utilization of Independent Individualized Instruction (III) in United States Emergency Medicine Residency Programs: Results of the Council of Emergency Medicine Residency Directors (CORD-EM) III Task Force Survey

Waxman M, Jiang J, Luber SD, Sawtelle S/Olive View-UCLA Medical Center, Los Angeles, CA; University of Texas Medical School at Houston, Houston, TX; UCSF Fresno, Fresno, CA

Background: Little is known about the number of EM residency programs using III, what educational resources are being utilized, and the barriers that exist to incorporating III activities.

Objectives: We seek to quantify the use of III among EM residency programs, determine barriers preventing integration of III,and identify resources being used by programs incorporating III.

Methods: During 2013, CORD-EM surveyed residency directors regarding utilization of III in their curriculum.

Results: A total of 104 residency programs responded. 63% of respondents were utilizing III, 37% of programs were not. Of the programs not utilizing III, 66% cited a lack of residency manpower required to implement III, 39% reported that an unclear definition of what constitutes a valid III exercise from the RRC-EM kept them from using III, 32% were concerned about an accreditation citation and 11% felt that it would not add a significant educational experience for residents.59% of EM residencies were using free, on-line sources, while others were using fee-based sources,or self-created educational activities. A variety of III educational activities were reported including: podcasts (38%), simulation sessions(48%), on-line videos (33%), and interactive Web based modules (45%).While 38% of programs had residents evaluate III during an annual program review, 36% of programs required residents to evaluate the educational component after each activity. For programs that evaluated residents- perceptions of III,36% reported perceptions as positive,29% mixed and 0% negative.All programs surveyed devoted less than 20% of total educational time to III activities.

Conclusion: The majority of emergency medicine residency programs have incorporated III into their education curriculum using a wide variety of resources. A significant number of programs have not adopted III due to an unclear definition of what constitutes an acceptable activity and the added workload on program administration.

6 Fifteen-minutes: Shifting the Paradigm of the Traditional Lecture for Adult Learners

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

Background: Traditional didactic lectures constitute a significant portion of Emergency Medicine curricula and conferences. When reviewing the 2013 conference curricula of three large national Emergency Medicine conferences: ACEP, AAEM, and SAEM, 30 minute to 1 hour lectures predominate. These 30 minute or 1 hour increments appear to be set arbitrarily, without input directly from participants. Studies indicate that maximal concentration for adult students peaks between 10 to 30 minutes.[1,2]

Objective: This study seeks to determine the optimal lecture length preferred by Emergency Medicine conference participants.

Methods: A survey was administered and collected in November 2013, during a large international conference (Essentials of Emergency Medicine) asking the following question: "What is the optimal length of a lecture?"

Results: Of 242 responses, 66% of participants selected 15 minutes, while 17% selected 30 minutes, 10% selected 5 minutes, 5% selected 45 minutes, and 1% selected 60 minutes (Table 1).

Conclusion: Traditional didactic lectures constitute a major modality through which Emergency Medicine physicians receive education. A review of the conference curricula of three major national Emergency Medicine conferences demonstrates that this modality still predominates, with lectures ranging from 30 minutes to 1 hour. However, our survey of Emergency Medicine conference participants

demonstrates a preference towards even shorter 15 minute lectures, commensurate to studies indicating that maximal concentration is achieved between 10 and 30 minutes. This suggests yet another paradigm shift in how we as educators need to adapt in order to deliver effective didactic lectures to adult learners.

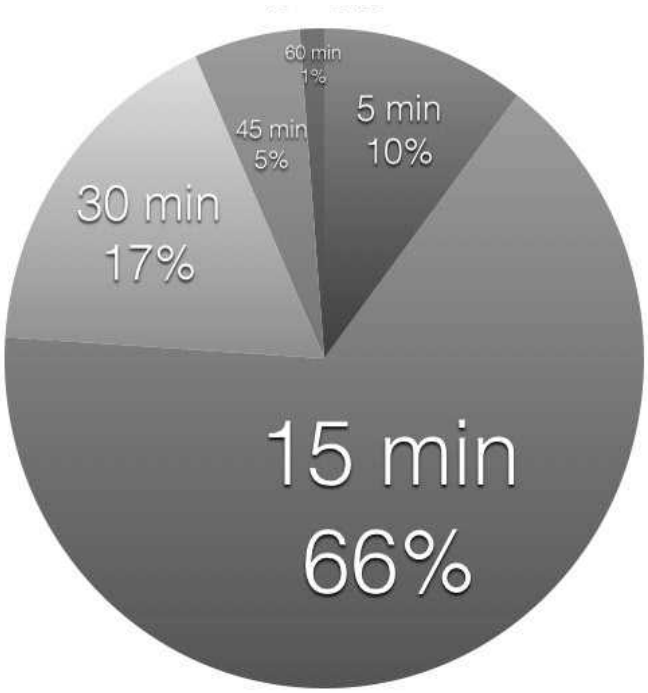

Figure 1. What is the optimal length of a lecture? (n=242).

7 Translational Education: Adapting to an Online Generation

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

Background: Traditional vehicles for medical education manifest as physical textbooks, journal publications, and educational conferences. The average lag time for research evidence to reach clinical practice is 17 years.[1] Physical textbooks lag research by about 10 years and major educational conferences are usually held annually and by their nature do not result in rapid or wide information transfer.[2] It is now impossible for clinicians to keep up to date by reading pertinent journals as there are too many journals. Frequently, updated online textbooks such as eMedicine and UpToDate attempt to bridge that gap, but it is unclear how frequently Emergency Medicine physicians utilize these modalities.

Objective: This study seeks to determine the length of time since Emergency Medicine physicians have read an entire journal article, as well as determine their primary source for finding out new information.

Methods: A survey was administered in November 2013 during a large international educational conference (Essentials of Emergency Medicine) asking the following questions: "When is the last time you read an entire journal article?" and "What is your first source for finding out information regarding Emergency Medicine topics?"

Results: Of 368 responses, 36% read an entire journal article more than one year ago (Table 1). Of 170 responses, 66% utilize online textbooks such as eMedicine and UpToDate for their primary source for seeking new information (Table 2).

Conclusion: Of this surveyed group of Emergency Medicine physicians, over one-third have not read an entire journal article in over one year. Journals and literature databases appear to be rarely sought out for information, with a major shift in reliance on online textbooks and audio podcasts for clinical questions and new information. Educational techniques need to take this into consideration and adapt to a changing generation of adult learners.

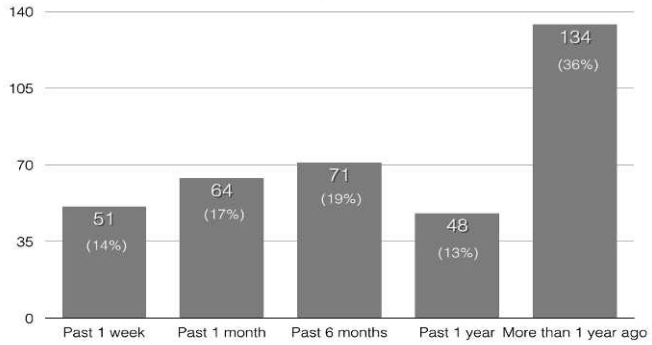

Figure 1. When is the last time you read an entire journal article?

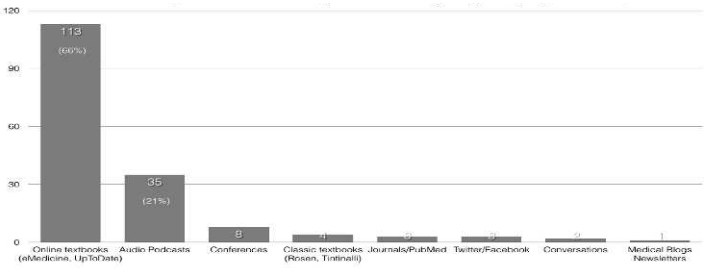

Figure 2. What is your first source for finding out information regarding emergency medicine topics?

8 EM Residency Schedule Improvement with Introduction of a Computer-assisted System

Brown N, Pilarski A/Medical College of Wisconsin, Milwaukee, WI

Background: Several EM residencies use manual shift schedules despite purported benefit of computer-assisted approaches. ACGME standards, academic requirements, and off-service needs unique to EM-training are an ideal target for computer assistance, but a cost barrier remains and no

evidence of benefit has yet been shown.

Objectives: To show whether introduction of computer-assisted scheduling in our residency resulted in fewer ACGME duty hours conflicts and/or difficult schedule combinations.

Methods: DESIGN - Retrospective, observational. SETTING - A 3-year EM residency with 27 total residents; 2 clinical sites, including a Level 1 trauma center. OBSERVATIONS - Monthly incidence of potential duty conflict (e.g., insufficient shift break), as well as difficult patterns (e.g., academic conference between consecutive night shifts, or AM following 24hrs after overnight work) was measured from Jul 2011 to Dec 2013, comparing 22 manual calendars to 8 calendars created with Tangier Emergency Physician Scheduling software. Confidence intervals of monthly events were calculated and heteroscedastic one-tailed T-tests used for significance.

Results: Use of Tangier EPS was associated with fewer academic conferences between consecutive night shifts (95% CI 4.7±0.8 reduced to 0.6±0.7 per month, p=0.0001) as well as a marginally significant decrease in potential duty hours conflict due to conference attendance (95% CI 0.5±0.4 to 0.1±0.3 per month, p=0.058). AM shifts following ?24hrs after nights decreased, but not significantly (95% CI 2.1±0.9 to 1.4±0.9 per month, p=0.13). We noted no fewer occurrences of insufficient shift break (95% CI 0.5±0.4 versus 0.6±0.6 per month).

Conclusions: Computer-assisted scheduling may benefit EM residencies by reducing difficult schedule combinations and potential duty hours conflicts. Improvement in schedule creation efficiency can also outweigh software cost.

Figure 1. Frequency of difficult combinations and duty conflicts before and after Tangier EPS introduction

9 Do Residents Value Relative Value? Emergency Medicine Residents' Estimation of RVUs and Potential Loss of Revenue

Tran CN, Habboushe J/Beth Israel Medical Center, New York, NY

Background: EM resident education does not typically cover the reimbursement amounts of common procedures. It also does not usually stress or enforce proper procedural documentation.

Objective: To assess residents' knowledge of reimbursements for common emergency procedures, and to analyze their self-reported documentation compliance rates.

Method: We surveyed 22 emergency medicine residents from our urban academic emergency department. We asked each resident to estimate the relative value units (RVUs) for 10 common emergency procedures, including: simple and complex I&Ds, lacerations, splinting, lumbar punctures, intubation, chest tube placement, smoking cessation, earwax removal, and shoulder reduction. They were then ask to estimate how often they do not properly document each procedure.

Results: There was a lot of variation among residents regarding estimated RVUs. Many procedures were underestimated, particularly chest tubes and shoulder reductions. Five of the 10 procedures were reported to be documented less that 90% of the time, with the lowest being smoking cessation (48%), and earwax removal (65%). These were associated with an annual revenue loss of $20,543 and $3,158 respectively.

Conclusions: Residents have a variable understanding of reimbursement rates for common emergency department procedures. While rare, high-paying procedures are typically well documented, common, low-paying procedures have lower documentation compliance rate resulting in a significant loss in revenue. More focus on the education of procedure documentation and reimbursement may lead to better understanding by the training physician as well as increased revenue for the hospital from higher documentation compliance rates.

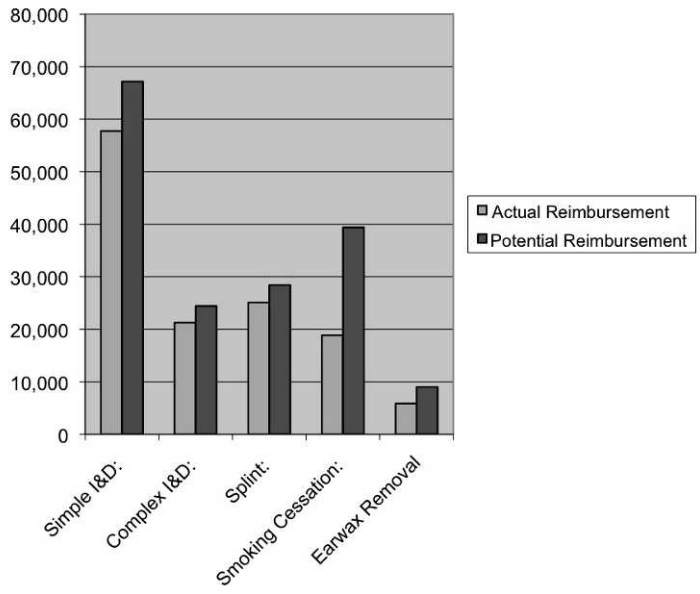

Figure 1.

10 Electronic Web-based Patient Follow Up Logging: Educational and Preferred

Wilson SP, Aslani B, Arrine A, Doyle D, Yang JJ, Goyal N/Henry Ford Hospital System, Detroit, MI; Sinai Hospital, Baltimore, MD

Background: Patient follow up logs are mandated by the Accreditation Council for Graduate Medical Education (ACGME) for all Emergency Medicine (EM) Residents nationwide. At our institution we developed and implemented an electronic, web-based format for the purpose of keeping this log.

Objectives: To determine if EM Residents at our institution found ACGME required patient follow up logging to be of educational benefit and if a web-based format was preferred over previously available formats (i.e. paper, excel spreadsheet, etc.).

Methods: At baseline an anonymous survey was conducted of all EM Residents at our urban Level 1 trauma center. The initial survey was distributed prior to the launch of the web-based format. Residents were subsequently allowed the option to use any format they preferred to log their patient follow up during the course of the year. After one year a follow up survey was conducted.

Results: A total of 41 residents participated in the baseline survey. 90.2% indicated that patient follow up logs had educational benefit while only 70.7% identified follow up as an ACGME requirement. Prior to the implementation of a web-based format, 70.7% demonstrated a preference for a web-based option if available. One-year after the implementation of the web-based format, 31 residents participated in the follow up survey. The mean number of follow up logs completed by the survey respondents had significantly increased from 54 to 158.2 ($p<0.001$) with 81.0% of residents preferring the web-based format over traditional logging formats.

Conclusions: The majority of residents at our program found patient follow up logs to be of educational value, thereby validating the ACGME requirement. Additionally, there was a clear preference for web-based format over more traditional follow up logs.

11 A Simple Intervention Increases Retention Rates of Medical Student Daily Evaluations During a Fourth Year Elective Rotation in Emergency Medicine

Golden A, Wasserman J, Bania T, Stratton J/St. Luke's-Roosevelt Hospital Center, New York, NY

Background: The majority of fourth year medical students' grades are determined by daily evaluations based on their shift performance. Asynchronous rotating schedules between students and attendings pose a unique challenge to evaluation adherence. The retention rates of student evaluations among both paper and electronic evaluations are low and sporadic ranging from 54-75% in previous studies.

Objectives: To increase the effectiveness of daily student evaluation retention rates through a simple envelope intervention. While not a novel idea, to our knowledge, the change in retention rates after such an intervention has never published.

Methods: We conducted a prospective study, evaluating the effect of a simple intervention on shift evaluation retention during two six-month periods, over two consecutive years (July-December 2010-11). Prior to intervention the paper evaluation was completed and returned by the physician. Following the intervention, the attending returned the evaluation within an envelope to the student, who placed it into a collection box. Quality data was recorded to measure the impact of the intervention for the 1330 daily shift evaluations among 136 students.

Results: During the control period, 64 students returned 550 evaluations with a median return rate of 8.6 evaluations per rotation, 61% of possible monthly evaluations. Throughout the intervention period, 72 students returned 980 evaluations, with a median return rate of 13.7, 97.8% of potential evaluations per rotation. The control and intervention groups return rate was found to be statistically significant ($U=31$, $Z=10.198$, $p=0.000$).

Conclusions: The simple intervention of shifting responsibility of evaluation retention from the physician to the student lead to a significant increase in retention rates. The dramatic improvement in retention rate of daily shift evaluations should lead to a more complete and fair evaluation of a student's performance during a 4th year rotation.

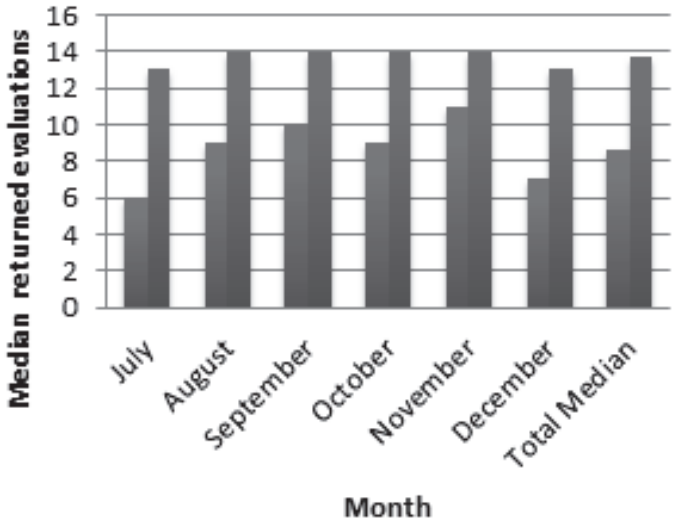

Figure 1. Median Medical Student Evaluations.
*First bar: Pre-intervention 2010, Second bar: Post-intervention 2011

12 Influencing Medical Student Selection of Emergency Medicine Residency Programs: The Interview Dinner, Food for Thought

Desai BK /University of Florida, Gainesville, FL

Background: Interest in EM has increased and it is challenging to select candidates that are qualified and a "good-

fit." Programs often offer a dinner prior to the interview to assist in showcasing the program's assets in an informal setting. Previous studies have identified factors considered important by applicants in their residency selection process, but none have explored the influence of attendance to an applicant/resident (A/R) dinner on an applicant's selection of programs.

Objective: To explore factors influencing candidate decision-making of EM residency programs based on the A/R dinner.

Methods: In this IRB approved study, 118 applicants who were granted interviews to our residency were surveyed after attending the A/R dinner and the interview. The survey consisted of 12 multiple choice questions gauged at elucidating the participants interest and feelings towards the interview dinner (Figure 1). Responses were collected anonymously and statistical analyses in the form of one-proportion z-tests were performed.

Self-reported answers:

1. How many interviews have you been on at this point?

Likert scale: 1=not at all important; 2= somewhat important; 3= very important

2. Do you feel the interview dinner is an important part of the interview process?

3. Has the interview dinner changed your perception about a program?

Likert scale: 1=a deterrent; 2=a catalyst; 3=neutral

5. Is having alcohol at the interview dinner a deterrent, catalyst, or is it neutral for ranking a program higher?

6. Does going out after the interview dinner to mingle with the current residents a deterrent, catalyst, or is it neutral for ranking a program higher?

Yes/No:

4. Do you feel the interview dinner is an appropriate way to measure your similarity to a program and its residents?

7. Do you feel that if you missed the interview dinner, you would be missing out on an important part of the interview process?

8. Do you feel that missing the interview dinner puts you at a disadvantage for being ranked higher on the rank list?

9. Is the interview dinner a hassle?

11. Do you feel that if you had to miss the interview dinner, you would have less of an impression of the program and the residents than if you had attended the dinner?

12. Would you be inclined to rank a program lower if you missed the interview dinner?

Likert scale: 1= act normally; 2= conform

10. Do you feel you act as you normally would at the interview dinner, or are you pressured into conforming/acting in certain way?

Figure 1. Survey instrument.

The survey was conducted after completion of the residency matching process ranking and actual matching of applicants in order to minimize response bias.

Results: Of the 118 candidates who had attended the interview dinner, 54 surveys were (45.8% response rate) returned; 2% had attended 0-4 interviews, 9% had attended 5-8 interviews, 59% had attended 9-12 interviews, and 30% had attended more than 12 interviews at the time of survey. The participant survey response analyses are included in Table 1.

Conclusion: Applicants applying to EM residency programs consider the A/R dinner before the interview to be a significant factor in helping them decide if they are a good fit for the program. While the elective A/R dinner is considered important to applicants and changed their overall impression of the program, applicants would still rank a program highly based solely on the interview day itself.

Table 1. Survey results.

Survey Question	Response 1 n (%)	Response 2 n (%)	Z-score	P-Value
	Not At All Important	Somewhat/ Very Important		
2.	0 (0%)	54 (100%)	7.348	<0.0001
3.	12 (22%)	42 (78%)	5.585	<0.0001
	Deterrent	Neutral/ Catalyst		
5.	0 (0%)	54 (100%)	7.348	<0.0001
6.	0 (0%)	54 (100%)	7.348	<0.0001
	Yes	No		
4.	50 (93%)	4 (7%)	6.246	<0.0001
7.	45 (83%)	9 (17%)	4.850	<0.0001
8.	50 (93%)	4 (7%)	6.246	<0.0001
9.	10 (19%)	44 (81%)	4.615	<0.0001
11.	40 (74%)	14 (26%)	3.527	0.0004
12.	8 (15%)	46 (85%)	5.713	<0.0001
	Act Normally	Conform		
10.	23 (43%)	31 (57%)	1.029	0.3036

13 The Role of Gender in Mentorship: A Study of the Tiered Mentorship Program in Emergency Medicine

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Background: Mentorship is important for professional growth. Despite the fact that greater than 90% of all residents agree that mentorship is important, only about 40% of medical

students have identified a mentor. The Ohio State University College of Medicine has an established tiered-mentorship program that incorporates students, residents, and faculty into groups (Kman, et al. TLM 25:4, 2013). Female trainees are less likely to identify a mentor and mentorship programs for women are rare.

Objective: Knowing that gender can influence mentorship, we investigated the impact of assigning gender-congruent groups on the perceived value of the program.

Methods: Groups were composed of at least one faculty member, one resident, one or more fourth-year medical students, and junior medical students of all years. Twelve groups were formed. Three of the 12 groups were comprised solely of females, while two of the groups were male exclusive. The remaining groups were formed based on common interests, prior mentor relationship, and included both genders.

Results: 93 students, 16 residents, and 17 faculty members participated in the program. 67 of 93 students (72.0%) responded to the survey. At the onset of this year's program, only 34.4% of students reported having a mentor, whereas after the program most confirmed that they had a mentor (72.3%). A majority (63%) disagreed with the statement that the gender distribution of their group contributed to their experience, as well as disagreed that they wanted a faculty mentor of their gender (86.4%) or a group composed of a single gender (95%).

Conclusion: While the tiered-mentorship group structure allows students to identify a faculty member mentor, the gender of this person and gender make-up of the group is less important. The primary role of gender was not perceived to be of value to students. Our findings led to the establishment of all mixed gender groups for this academic year.

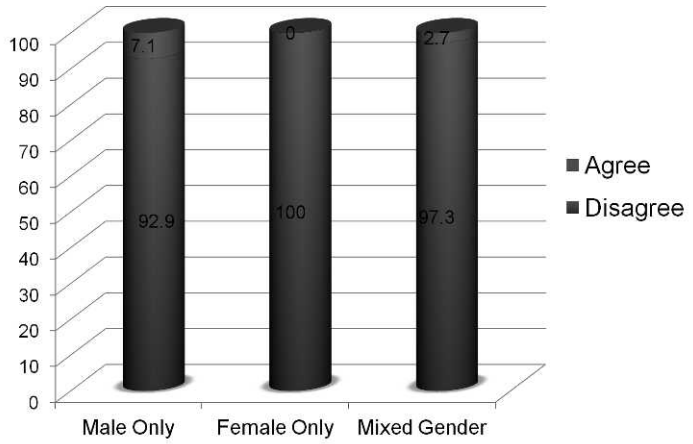

Figure 1. Response to "I would prefer to be part of a group composed of only members of my gender."

14 Length of Residency Program and Gender Distribution in Academic Emergency Medicine Departments

Agboola F, Peak DA/Harvard School of Public Health, Boston, MA; Massachusetts General Hospital, Boston, MA

Background: Although there has been an increasing participation of women in medicine in the past decades, women remain less likely to be faculty and departmental leaders in emergency medicine (EM).

Objectives: To determine the association between the length of EM residency programs (3-year versus 4-year) and the gender distribution of faculty and residents in emergency medicine. We hypothesized that the length of the residency program would not influence the gender distribution of departmental leaders, faculty or residents.

Methods: This was a cross-sectional study of 157 academic EM departments conducted between June 1-30, 2013. Using a data abstraction tool, we visited the website of all 157 EM residency programs to extract data on the following variables: length of program, number and gender distribution of residents, PDs, faculty and titled faculty. We defined titled faculty (TF) as a faculty member with a title distinguishing them from other faculty, a proxy for departmental leadership. Sixteen out of twenty programs that did not have the information on their website were contacted by phone using a script to collect the same information. Data were analyzed using T-test and chi-square tests. A p-value of <0.05 was considered significant.

Results: 120 (76%) programs were three-year and 37 (24%) were four-year. Women chaired 10% (n=15) of departments and comprised 27% (n=43) of all PDs, 24% of TF, 31% of all faculty, and 37% of residents. 4-year programs had a significantly higher percentage of female TF, female faculty and residents compared with the 3-year programs [(0.30 versus 0.23; p=0.05), (0.36 versus 0.29; p=0.001)&(0.45 versus 0.35; p=0.0001) respectively]. There was no significant relationship between the length of the training program and gender of the chairperson (p=0.7) or gender of the PD (p=0.5).

Conclusion: EM 4-year residencies are more likely to have a higher proportion of female titled faculty, female faculty members and female residents.

15 Effect of EM Intern Month on Patient Satisfaction Score

Cheng D, Stone J, Hunter S/UHCMC, Strongsville, OH

Objective: We sought to determine the effect on emergency department patient satisfaction score of having all ten newly matched emergency medicine interns working in the ED for the month of July.

Method: Using the Press Ganey emergency department patient satisfaction scores, we compared July scores with the non-July months score range for doctor courtesy, doctor time to listen, doctor took problem seriously, doctor concern for comfort and doctor informative regarding treatment. A July score that falls within the range is considered the norm.

Results: The results are shown in Table 1. From the July scores compared to the Non-July score range, there was an increase in doctor courtesy, doctor time to listen, doctor took problem seriously and doctor took problem seriously when

the all the newly matched interns were in the Emergency Department with no change in doctor informative of treatment.

Limitations: Small sample size of single year of data at a single tertiary care institution

Conclusion: There is increase in Press Ganey patient satisfaction scores when all newly matched emergency medicine interns are scheduled to work.

Table 1: Patient Satisfaction Scores.

	July Score	Non-July Range
Courtesy	91.1	81.3-88.6
Listen	89	82.3-85.6
Seriousness	89	80.6-84.1
Comfort	89.6	78.8-84.2
Informative	84.8	80.2-84.8

16 Predictors of Success in EM Residency: A Multicenter Study

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Background: Significant time and effort is required to evaluate credentials of applicants applying to emergency medicine (EM) residency programs. Prior research does not offer an evidence-based approach to valuing each credential to predict an applicant's success during and after residency training.

Objectives: To evaluate the association between EM residency applicants' credentials (predictors) and their subsequent performance during and after residency training (outcomes).

Methods: This was a retrospective multi-center sample of all residents in the three most recent graduating classes from 9 participating EM residency programs as a follow-up to a prior study evaluating 4 EM programs. The correlation between predictor and outcome variables was examined using univariate analysis, with r>0.2 considered meaningful.

Results: A total of 286 residents from 9 institutions were evaluated. Of 31 predictors (Table 1) analyzed, 14 showed a meaningful correlation with an outcome variable. Of these, 5 had 3 or more meaningful correlations. Applicants' grade during EM away rotation, USMLE Step 1 and Step 2 CK scores, interview scores, as well as "Global Rating" on the Standard Letter of Recommendation (SLOR) showed the strongest association with outcomes (Table 2). USMLE Step 1 and 2 CK scores most strongly correlated with the outcomes of medical knowledge, in-training scores, and passing the ABEM qualifying exam. EM away rotation grade, SLOR global rating, and interview scores most strongly correlated with resident performance in the core competencies.

Conclusion: EM away rotation grades, USMLE Step 1 and 2 CK scores, SLOR global ratings, and interview score were the strongest predictors of EM residency applicants' success during residency. Future research using a weighted algorithm along with incorporation of the new standard letter of evaluation and New Accreditation System milestones to prospectively evaluate EM residency applicants may be warranted.

Table 1. List of predictors for success in EM residency and categories of successful outcomes.

Predictors	Outcomes
Core Third Year Clerkship Grades	Rank order of Resident Performance using Semi-Annual Evaluations at Midpoint and End of Residency (Stratified by Core Competency)
Home/Away EM Clerkship Grade	
Ratings from Dean's Letter (MSPE)	
USMLE Step 1&2 Clinical Knowledge Raw Scores	Chief Resident
	Remediation during residency
Standard Letter of Recommendation scores components	American Board of Emergency Medicine (ABEM) In-training Score in Final Year of Residency
Interview Score	
Rank List Tier	Successful completion of EM Residency
Alpha Omega Alpha Membership	Passing ABEM Qualifying Exam and Oral Boards on First Attempt
Gold Humanism Award	
Other Awards	
Medical School Attended – based on US News and World Report 2013 rating for primary care, research and average	Number of Presentations at National Meetings during Residency
Degree Earned (DO or MD)	Number of Publications during Residency
International versus US Medical Graduate	Extracurricular Activities During Residency
Extracurricular Activities	Job Type Post-Graduation (Community versus Academic versus Fellowship)
Prior EM Experience	
Prior Work Experience	
Number of Presentations at National Meetings	
Number of Publications	
Distance from permanent home address to residency program	

Table 2.

Predictor	# Positive Correlations, r>0.1	# Negative Correlations, r<-0.1	# Positive Correlations, r>0.2
Surgery Clerkship Grade	12	0	0
Medicine Clerkship Grade	4	1	0
Pediatrics Clerkship Grade	11	0	2
Obstetrics/GYN Clerkship Grade	2	0	0
Family Medicine Clerkship Grade	4	0	0
Psychiatry Clerkship Grade	3	2	0
EM Home Clerkship Grade	5	0	0
EM Away Clerkship Grade	14	3	*6
EM Away 2nd rotation Clerkship Grade	10	1	*6
MSPE – Dean's Letter	1	2	0
USMLE Step 1	6	1	*4
USMLE Step 2 CK	11	1	*4
Rank List tier	16	0	1
Extra activities	6	2	1
Prior Work experience	1	0	0
Prior EM experience	1	0	0
AOA Honors society election	7	0	1
Gold Humanism award recipient	1	0	0
Other awards	7	2	0
International Medical Graduate	3	2	0
DO versus MD	2	1	0
Medical school attended research rank	2	3	0
Medical school attended primary care rank	0	3	0
Medical school attended average rank	1	4	0
Interview Score	14	1	*7
Distance from Home	1	4	0
Number of Presentations	3	1	2
Number of Publications	4	4	2
SLOR work ethic	8	1	0
SLOR global	13	1	*3
SLOR competitiveness	10	0	1

17 Assessing Faculty Milestone Competencies

Shah SH, Church R, Bird SB/Univ of Massachusetts Medical School, Shrewsbury, MA

Background: ACGME Milestones provide a spectra of competencies on which to evaluate resident physicians. Little is known about the application of these Milestones to practicing EM attendings.

Objectives: To determine faculty self-assessment (SA) of their competency on all Milestones and to compare these SAs to just-graduated resident assessments (RA).

Methods: Six faculty of the UMass emergency medicine residency (3 women, 3 men) performed SA on all 23 Milestones using published Milestone forms (rating from 1 to 5 in 0.5 increments). Six just-graduated residents performed anonymous assessments of the six faculty and were blinded to the SAs. Means for faculty SAs of all Milestones were calculated. The means for each faculty were calculated from RAs. Correlation of faculty SA and RA were determined using Goodness of Fit. The sum of an individual faculty SA minus the mean RA for all Milestones was then calculated to determine if faculty under or over-assessed their competency compared to RA

Results: Mean years since residency graduation for faculty was 7 (range: 2-13). Mean faculty SA of all 23 Milestones was 4.44 (range 4.26 to 4.78). The lowest mean SA was 4.0 on Milestone #12 (goal-directed U/S) and #22 (SBP); the highest mean SA was 5.0 on Milestone #14 (vascular access) and #15 (MK). The mean of all RA was 4.50 (range 4.16 to 4.69) with highest and lowest assessment on Milestone #15 (MK; mean 4.97) and #12 (goal-directed U/S; mean 4.15), respectively. There was no statistically significant correlation between faculty SA and RA (slope=-0.248, p=NS, Fig 1). The mean sum of all faculty SA minus the mean of RA was -1.89, with individual range of -8.68 to 6.76.

Conclusions: As a whole, faculty SA and RA of faculty competencies are similar and congruent. However, there is

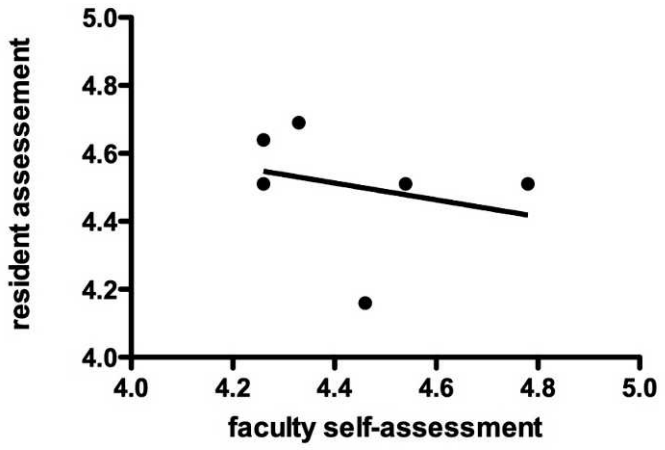

Figure 1. Faculty self-assessment versus resident assessment.

considerable individual variation in SAs compared to RAs.. The marked range of difference between faculty SA and RA of competencies should be explored as a method to assist in faculty development.

18 Resident Teaching of Cardiac Ultrasonography: Assessment of a PC-based Educational Tool

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Objectives: Ultrasound is a required component of emergency medicine (EM) training. The goal of this study was to determine if a PC based multimedia(MM) tutorial is as effective as traditional didactic lectures for (1) teaching EM residents point-of-care echocardiography, (2) improve a resident's identification of normal and abnormal cardiac anatomy.

Methods: This was a prospective cohort study at an urban, academic, tertiary center with a 30 PGY 1-3 EM residents. Half of each class was randomized to 2 groups: (1) traditional lecture given by RDMS EM faculty or (2) case based MM educational activity developed onsite. Educational content was similar for both. Students were given a 20 questions pre-test, post-test and a 6- and 12-month post-test.

Results: None of residents had prior formal instruction on emergency cardiac ultrasound. The test means are delineated in Table 1 (below).

The differences between the pretest scores of the lecture and MM groups, stratified by PGY level and as groups, did not achieve significance. After instruction, all groups increased their mean test scores. In the lecture group, the difference in test score for the PGY-1 residents was significant, p=0.026, but not for PGY-2/3 residents. For the MM group, the difference in test score for the PGY-1/3 residents achieved significance, p=0.023 and p=0.008, respectively. The post instructional scores for the lecture and MM groups, as a whole and stratified by PGY level, was not significant With the six-month and one-year follow up scores, the difference in test scores for the lecture and MM groups, as a whole and stratified according to PGY level, was not significant. In the lecture and MM group, as a whole and stratified according to PGY level, the test scores for the entire one year period did not achieve significance.

Conclusion: A multimedia tutorial is similar to traditional didactic lectures in teaching residents basic emergency echocardiography.

Table 1. The resident testing results demonstrated as mean scores and standard deviations.

		Test Scores ± SD		
		PGY-1	PGY-2	PGY-3
Lecture	Pretest	60 ± 13.3	56 ± 15.2	77 ± 13.1
(Group 1)	Post Instruction	84 ± 10.7	70 ± 11.4	86 ± 8.6
	6 Month Post	83 ± 13.1	73 ± 12.5	87 ± 7.9
	1 year Post	82.4 ± 6.0	76.6 ± 19.3	88.8 ±12.6
Multi-Media	Pretest	60 ± 7.9	59.2 ± 10.2	65.2 ± 11.4
(Group 2)	Post Instruction	81.4 ± 13.3	74.6 ± 17	92 ± 4.9
	6 Month Post	76.6 ± 9.1	79 ± 11.2	87 ± 7.4
	1 year Post	64.2 ± 17.6	83.4 ± 8.0	89.8 ± 6.1

19 Repetition Improves Residents' Ability to Triage in a Simulated Mass Casualty Incident

Pasirstein MJ, Ramoska E, Minczak B, Erbaryi JA, Teufel JM, Parsons JR/Drexel University College of Medicine, Philadelphia, PA

Background: Unlike other prehospital providers, emergency physicians providing care at mass gatherings are often not taught the START (simple triage and rapid treatment) method of triage or the National Incident Management System (NIMS).

Objectives: It is hypothesized that by providing lectures followed by repeating scenarios, students will learn techniques of mass casualty incident (MCI) triage, perform with better accuracy and faster times.

Methods: Five residency programs in Philadelphia participated in an EMS conference in May 2013. After didactics on START and NIMS, residents entered classrooms with low-fidelity manikins. All scenarios were identical

Table 1.

Scenario	Number of Tasks Completed Properly	Number of Tasks not Completed Properly	Percentages of Tasks Completed Properly	Percentage of Tasks not Completed Properly
1	34	30	53.13%	46.88%
2	44	12	78.57%	21.43%
3	30	2	93.75%	6.25%

Table 2.

Scenario	Baseline Time	Time 2	Time 3
1	7	15	10
1	5	5	4
1	15	10	5
1	10	7	3
2	4	4	
2	5	10	
2	8	5	
Mean	7.7	8	5.5

in mechanism with only the setting and demographic information as variables. Manikins used included CPR manikins, MCI Man and Ty Beanie Babies; they were assigned demographics, mechanism of injury, injuries, and vital signs. Each group received similar instruction by an evaluator to assess and triage the discovered victims using the START triage method. Each evaluator had NIMS knowledge and START triage method ability. Subjects were evaluated as a group and graded on eight predetermined accomplishments. Upon completion of the scenario, the total time was recorded for each group, they were provided immediate feedback, and moved on to the next scenario.

Results: Of a possible 192 evaluated tasks, 160 were documented. Initially 53% of tasks were completed successfully; this improved to 94% after repeated attempts (Table 1). Of a possible 24 times, 18 were recorded. The mean time increased from 7.7 min to 8 min after the 1st round of repetition then decreased to 5.5 min after completion of the 3rd scenario (Table 2). This was not statistically significant.

Conclusions: Utilizing low-fidelity manikins and repetition with direct, immediate feedback, residents can learn to perform pre-hospital triage successfully. Limitations include poor data collection, and follow-retention at a later time.

20 Emergency Medicine Interest Group – Opinion of Graduating Medical Students

O'Keefe KA/East Carolina University, Greenville, NC

Background: Medical student interest groups expose preclinical medical students to a variety of medical specialties prior to the final two years of medical school. The effectiveness in recruitment of these interest groups including Emergency Medicine Interest Groups (EMIG) is unknown.

Objectives: Our aim was to better determine the efficacy of the interest group experience in choosing a medical specialty. Additionally we hoped to find out what the students hoped to gain from their involvement in the EMIG.

Methods: A convenience sample of medical students was anonymously surveyed in May 2013 from the Brody School of Medicine at East Carolina University.

Results: A total of 67 students completed the survey, representing 95.7% of the graduating class. A total of 15 (22%) of the responders stated that they were a member of the EMIG at ECU. Only 3 of these students (4.5%) matched into an EM residency. More students noted that interest groups were "very important" in meeting faculty (62%) as opposed to shadowing (49%), hands on workshops (43%), or lectures (37%). 97% would recommend joining an interest group to incoming first year medical students, although only about half (54%) stated that interest groups had an effect on which residency the student ended up choosing. Of the 29 graduating students that went into primary care specialties (FM, IM, pediatrics, Med-Peds) only 2 were members of EMIG.

Conclusions: Graduating medical students overwhelmingly recommend joining interest groups to incoming medical students but are less likely to support that interest groups had an effect on which residency they chose. EMIG specifically may not be an effective way to recruit students to the field of emergency medicine.

21 Addressing Emergency Medicine Residents' Interest in Teaching Medical Students

Nordquist EK, Emebo M/John H. Stroger, Jr. Hospital of Cook County, Chicago, IL

Background: Emergency medicine residents encounter the challenge of teaching medical students in a busy clinical setting. Prior teaching experience and interest in teaching amongst the residents was unknown at our institution.

Objectives: The purpose of this study was to assess emergency medicine residents' need for instruction on how to teach medical students and level of interest. This study also measured the response to an intervention that educated residents on how to teach, evaluate, and provide feedback to medical students.

Methods: Emergency medicine residents were requested to complete an anonymous, 10-question online survey on their perceived role and level of interest in teaching medical students. After completing the survey, residents attended a 4-hour lecture series on two regularly scheduled conference

Table 1. Intervention Survey Data

5-point Likert Scale Average for Each Lecture	Lecture Topic			
	Feedback (n=16)	Evaluations (n=16)	Bedside Teaching (n=10)	Teaching Clinical Reasoning (n=10)
The material clearly met the stated goals	4.8	4.5	4.4	4.2
The material was well presented	4.9	4.7	4.5	4.4
The material was easy to understand	4.9	4.8	4.6	4.4
I plan to use the material presented in the future	5.0	4.8	4.2	4.1
The information presented was practical	4.8	4.7	4.4	4.2

days. Conference attendees evaluated the quality of the lectures using a 5-point Likert scale. Lecture topics included teaching clinical reasoning, bedside teaching, giving feedback, and evaluation.

Results: There was an 83% response rate (53 of 64 residents) to the online survey. A majority of the residents (89%) reported an interest in teaching medical students; however only 9% reported receiving formal instruction during residency on how to do so. Sixty-three percent of residents rated themselves as novice or beginner level teachers. Seventy-five percent of residents have an interest in receiving didactics on how to teach medical students. On average, residents who attended the sessions found that the information was practical and plan to use it in the future (Table 1).

Conclusions: A majority of emergency medicine residents are interested in teaching medical students and receiving instruction on how to do so. Residents who received instruction on teaching, evaluating, and giving feedback to medical students found it practical and plan to utilize what they learned. Future studies will evaluate if residents change teaching habits after educational workshops.

22 Ultrafest: A Novel Approach to Ultrasound in Medical Education Leads to Improvement in Written and Clinical Examinations

Connolly KC, Langdorf M, Fox JC/University of California, Irvine, Irvine, CA

Background: Medical student ultrasound (US) training is variable in medical school. As a promising adjunct to physical examination, US provides more physical data in skilled hands.

Objective: To evaluate effectiveness of training at a bedside US symposium ("Ultrafest") to improve clinical knowledge and image acquisition by medical students. Primary outcome was improvement in multiple choice question score for pulmonary or FAST (Focused Assessment with Sonography in Trauma). Secondary outcome was improvement in image acquisition in four windows on human models for pulmonary or FAST.

Methods: Prospective, before and after, cohort study of 48 volunteers (23% of 208 attendees) at "Ultrafest," a free symposium. Students attended 5 of 12 hands-on US workshops for 5 training hours. We measured each student in pulmonary US or FAST, by clinical knowledge on multiple-choice exam, and accuracy of image acquisition. We used paired sample t-tests with students as their own controls.

Results: Of 48 students, 46 (96%) had complete written test data. Pulmonary written test scores for 26 students increased by mean 10.1 points (95% CI 8.9-11.3, $p<0.00005$) from pretest 9 to post-test 19/21 possible points. Twenty-two students completed FAST pre- and post-Ultrafest written exams. FAST knowledge scores increased by mean 7.5 points (95% CI 6.3-8.7, $p<0.00005$) from pretest 8 to post-test 16/21. We gathered clinical skills data on 32 students (67%, 16 excluded for failure of image storage). Mean score was 1.7 pre- and 4.7/12 on post-test. Mean improvement was 3.0 points ($p<0.00005$) overall, 3.3 ($p=0.0001$) for FAST exam, and 2.6 ($p=0.003$) for pulmonary.

Conclusions: Teaching medical students US in a small group hands-on setting leads to significant improvement in tests of written knowledge and image acquisition. However, image acquisition was inadequate. Further studies will determine long-term retention or improved patient outcomes.

23 Beyond Premature Diagnostic Closure: Assessing Resident Knowledge of Decision Making Errors

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Background: Cognitive errors are a well-known but little-studied cause of missed diagnosis in the emergency department. Residents, with little clinical experience to fall back on, can be especially prone to these errors, which are not often taught as a part of residency curriculum.

Objective: To assess resident knowledge of common patterns of decision making errors. We hypothesized that residents would be able to identify "premature diagnostic closure" as it is frequently discussed, but that there would be poor knowledge of the other types of diagnostic errors.

Methods: At two emergency medicine residencies, residents were presented with ten brief case scenarios illustrating a decision making error and asked to identify the error from several choices. The ten errors were selected as the most important for residents by consensus of five attendings, and included anchoring and adjustment, aggregate bias, base rate neglect, playing the odds, the posterior probability error, the availability heuristic, diagnosis momentum, premature diagnostic closure, search satisfying, and commission bias. All residents were eligible for inclusion other than third year residents at one institution, who were not available to participate. Responses were recorded live via audience response clickers or online

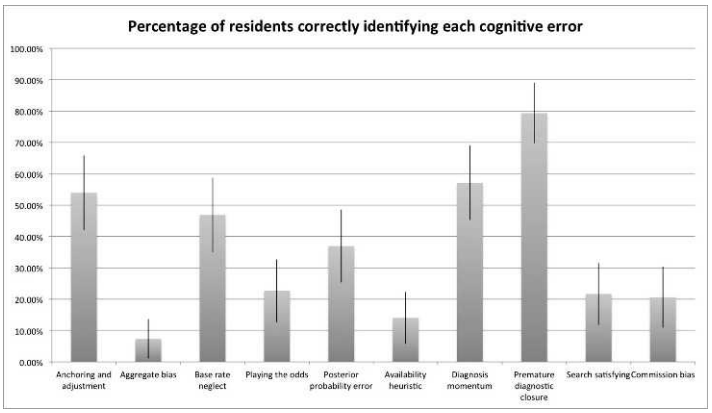

Figure 1.

survey. The response rate was 78%.

Results: 79% [95% CI: 70-89%] of residents correctly identified premature diagnostic closure (highest score). Significantly fewer residents were able to identify each of the other decision making errors ($p<0.01$), including only 7% [95% CI: 1-14%] of residents who identified the aggregate bias.

Conclusion: Resident knowledge of decision making errors other than premature diagnostic closure is poor. While this was a small study using unvalidated examples of decision making errors, it suggests that more education is necessary and that more studies are needed to determine if medical errors can be prevented by teaching residents about cognitive pitfalls.

24 Medical Student Milestones in Emergency Medicine

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Background: Medical education is a continuum from medical school through residency to unsupervised clinical practice. There has been a recent movement toward competency-based medical education prompted by the Accreditation Council for Graduate Medical Education (ACGME), using milestones to assess competence. While implementation of milestones for residents sets specific standards for transition to internship, there exists a need for the development of competency-based instruments to assess medical students as students progress toward internship.

Objective: Our objective was to develop competency based milestones for medical students completing their Emergency Medicine clerkship.

Methods: We performed a literature review and assembled a list of potential milestones. We then assembled a Delphi expert panel of 23 faculty including program directors (4), clerkship directors (16), assistant deans (5), and a medical student from 19 different institutions to investigate consensus on these milestones through two rounds of a modified Delphi protocol.

Results: Of the initial 39 milestones, 12 were removed at the end of round 1 due to low agreement on importance of the milestone or because of redundancy with other milestones. An additional 12 were revised to improve clarity or eliminate redundancy, and 1 was added based on participant suggestions. Of the 28 milestones moving to round 2, consensus with a high level of agreement was achieved for 24 of the milestones. These were mapped to the ACGME EM residency milestone competency domains, as well as the AAMC's Core Entrustable Professional Activities for Entering Residency to improve content validity.

Conclusion: Our study found consensus support by experts for a list of 24 milestones relevant to the assessment of fourth year medical student performance by the completion of their EM clerkship. The findings are useful for development of a valid method for assessing medical student performance as the student approaches residency

Table 1. Importance for fourth-year student to be competent in the following milestones.

		Round 1			Round 2		
#	Milestone	Mean	LoA	Outcome	Mean	LoA	Outcome
1	Recognizes abnormal vital signs	4.91	High	Round 2	5.00	High	Milestone
4	Performs and communicates a reliable, comprehensive history and physical exam	4.30	High	Round 2	4.41	High	Milestone
6	Constructs a list of potential diagnoses based on chief complaint and initial assessment	4.39	High	Round 2	4.64	High	Milestone
11	Formulates basic diagnostic and therapeutic plans based on differential diagnosis	4.22	High	Round 2	4.64	High	Milestone
14	Describe basic resources available for care of the ED patient	3.48	Low	Remove: Low Agreement	--	--	--
34	Perform venipuncture or place IV	3.70	Low	Remove: Low Agreement	--	--	--

25 A Resident-matched EM Sub-intern Schedule Increases the Quality and Quantity of Feedback to Improve Medical Student Assessment

Runde DP, Cunningham J, Vermillion M, Krasne S, Coates WC/Harbor-UCLA, Torrance, CA; David Geffen School of Medicine at UCLA, Los Angeles, CA

Background: Meaningful feedback to sub-interns (SI) in EM is key for career preparation and to provide performance assessments to residency programs. Our SI schedule was based on a Circadian template independent of EM residents, resulting in students working with multiple supervisors. SIs solicit feedback using shift cards which are electronically tabulated. We noted inadequate quantity and quality of feedback over many years. Starting this academic year, SIs were assigned to a resident-matched schedule (RMS), resulting in more clinical time with the same resident(s).

Objective: To evaluate whether a RMS improved the quantity and quality of feedback for SIs.

Methods: We performed a mixed-methods analysis of feedback for SIs from June-October 2013 compared to the same months in 2012. Feedback was abstracted from summative evaluations (identifiers were removed). The number of comments and average words per comment were recorded for each student and then averaged for per month. Comparisons between both years were made using standard descriptive statistics. Qualitative analysis using grounded theory identified themes and patterns in the written feedback for each set of months in the study period until saturation was achieved.

Results: Mean comments per student: 11.33 versus 13 (p=0.064, 95% CI -0.12-3.45) pre and post-intervention. Mean number of words per resident comment increased from 28.8 to 68.8 (p=0.0007, 95% CI 23.5-56.5); per faculty comment from 33.8 to 38 (p=0.49, 95% CI -9.5-17.9). Pre-intervention comments included global, insipid feedback. Negative comments were isolated. Feedback from the new template yielded more descriptive comments (positive and negative), and longitudinal feedback.

Conclusion: A RMS resulted in increased resident-provided feedback. Qualitative analysis found that creating student-resident dyads resulted in more meaningful feedback that commented on skill development and included constructive criticism that was followed over time.

26 A Novel Method for Teaching and Assessing Emergency Department Disposition for Interns: the R2D2 Protocol

Arthur DE, Roppolo L, Pease J, Siciliano G, Thomas B/ University of Texas Southwestern, Dallas, TX

Background: One of the milestones for emergency medicine (EM) residents focuses on emergency department (ED) disposition. We developed a protocol called R2D2, which stands for Reassess patient, Review workup, Discuss the plan of care with the attending and patient, and Discharge summary or treatment plan.

Objectives: We hypothesized that the R2D2 disposition protocol would improve patient's understanding of discharge instructions.

Methods: DESIGN - A prospective randomized trial. SETTING - A university affiliated county hospital. PARTICIPANTS/SUBJECTS -18 EM interns were randomized to the either the R2D2 protocol or standard training for their first ED month. All interns were asked to consent all of their discharged patients for this study unless they were admitted or did not have a telephone number for follow-up. INTERVENTIONS - Interns in the R2D2 group used this protocol to guide them in discharging their ED patients which included a discharge documentation template. Consented patients were later called by research personnel to determine their understanding of discharge instructions. A comparison between the two groups was then made using Fisher's Exact Test.

Results: 331 patients (R2D2= 245, Standard= 86) consented to participate. 48% (158) (R2D2= 119, Standard= 39) had follow up according to protocol. Patients discharged by the R2D2 trained interns were more likely to be able to correctly describe their discharge diagnosis ($p<0.05$), treatment plan ($p<0.001$) and follow up plan ($p<0.001$) and were more likely to be given return warnings for the ED by their intern ($p<0.05$).

Conclusions: Intern utilization of the R2D2 protocol resulted in a greater patient understanding of diagnosis, treatment and follow-up.

Limitations: There were discrepancies in study group size as the R2D2 interns were aware of the study and recruited more patients. Secondly, many patients could not be contacted for follow-up presumably due to their socioeconomic circumstances.

27 Visual Analog Scales as a Global Assessment Method of Acting Internship Student Clinical Performance

Hiller KM, Stolz U, Waters K/University of Arizona, Tucson, AZ

Background: Visual Analog Scales (VAS) are a rapid and reliable method of global assessment that finely discriminate clustered variables. Medical student assessment in the Emergency Department (ED) is commonly performed using Likert scales (LS), which restrict the rater to predetermined, frequently anchored, categories.

Objectives: Because Acting Internship students (AI) are frequently scored very similarly on shift, VAS may better discriminate global performance between students.

Methods: In this quality improvement project, we included a 10 cm VAS (0=best student with whom I have ever worked, 10=worst student with whom I have ever worked) after traditional evaluation of AI students in the ED. Evaluation scores (ES) are an average of anchored LS (1-5) for energy/interest, fund of knowledge, judgment/problem solving ability, clinical skills and personal effectiveness. Because students had multiple evaluations, and faculty evaluated multiple students, we included both faculty and students in our final model as random effects, using mixed effects linear regression.

Results: A total of 107 VAS and ES were analyzed for 11 students by 27 faculty. Means and standard deviations of the ES and VAS were 4.1 (0.5) and 3.0 (1.7) respectively. Pearsons correlation was 0.53. For a 1 point change in ES, we observed a 1.7 mm change in VAS. For example, two students with a 1 point difference in ES, there would be a 1.7 mm change in the VAS score.

Conclusions: ES based on LS were tightly clustered and only used roughly half of the scale. VAS scores were more widely distributed across the entire scale. Much, but not all, of an end of shift global assessment of students (VAS) was

predicted by their ES. The VAS appears to incorporate more information than is contained in the ES, despite the scoring of multiple domains via LS, and it had a wider distribution. When used by seasoned evaluators, VAS may be better able to discriminate students who are tightly clustered near the mean.

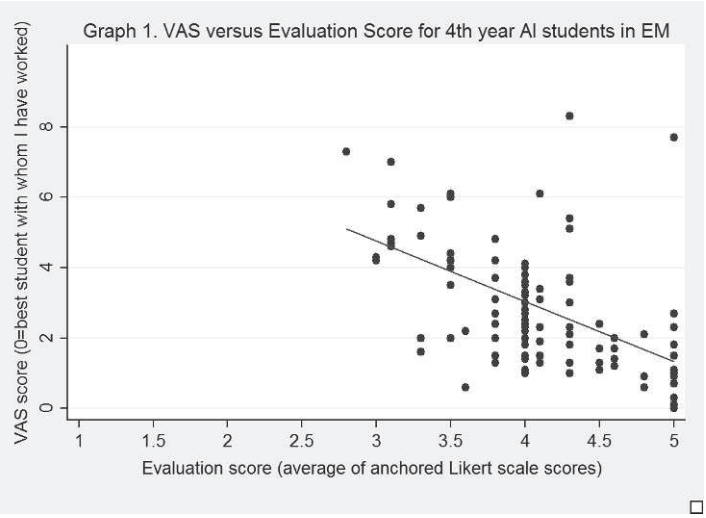

Figure 1.

28 How do Emergency Medicine Interns Affect Medical Student Clerkship Experience in the Emergency Department?

Wei G, Yang A, Mody B, Ohman-Strickland P, Riggs R/ Rutgers - Robert Wood Johnson Medical School, New Brunswick, NJ

Background: As Emergency Medicine (EM) becomes increasingly recognized; more schools are offering EM clerkships to 3rd and 4th year medical students. Studies have examined how attendings affect the medical student experience and how medical students affect attending productivity. However, if and how residents affect the medical student experience has not been examined.

Objectives: This study was designed to determine whether the presence of EM interns affected medical student experience during their clerkship.

Methods: At our medical school, EM is a required fourth year clerkship. Students are asked to complete a 47-question survey about their experience at the end of their rotation. Questions were based on a 5-point Likert scale with 1 being the most negative and 5 being the most positive. The control group completed surveys in 2009-2010, before our emergency medicine residency started. The study group completed surveys in 2010-2011 when intern residents were present in the ED. Interns did not have a formal role in medical student education.

Results: 84 control group students completed the survey and 71 study group students completed the survey. Of the 47 questions answered, all but three questions had lower scores in the study group. For 18 questions, the drop in score was statistically significant ($p<0.0103$-0.049). The 3 questions that scored higher in the study group were all significantly higher ($p<0.00001$) and addressed staff professionalism including specifically residents.

Conclusions: It was surprising to find that medical student satisfaction with the Emergency Department experience was statistically lower after the residency started despite residents having no direct role in medical student education. However, residents likely competed with students for attending teaching time, patients, and procedures. The authors believe that this perceived competition is responsible for the decline in medical student satisfaction.

29 A Survey of the CORD Listserve: Teaching and Assessment Methods Used by Emergency Medicine Residency Programs for Difficult Milestones

Roppolo L, Omron RM, Akhtar S/University of Texas Southwestern, Dallas, TX; Johns Hopkins University School of Medicine, Baltimore, MD; Beth Israel Medical Center, Albert Einstein College of Medicine, New York, NY

Background: The Milestones were developed to create a framework for the assessment of resident competency. Unfortunately, some milestones are more "difficult to assess" such as practice-based learning and improvement, patient safety, systems based management, and technology.

Objective: To develop a comprehensive resource of teaching and assessment methods used by emergency medicine (EM) residency programs for these "difficult to assess" milestones.

Methods: DESIGN - An IRB approved survey. SETTING - A survey monkey was sent through the CORDEM listserve. PARTICIPANTS/SUBJECTS - EM residency programs who subscribe to the CORD listserve. INTERVENTIONS - A 15-question survey, validated by 7 former EM program directors, was sent via the CORDEM listserve to EM residency programs in the Fall of 2013. The survey consisted of questions about the teaching and assessment tools used for these milestones.

Results: 62% (99/160) of EM residency programs responded. Programs use a variety of methods to assess EBM skills (see Figure 1). Most programs do patient follow-up through follow-up logs (79%), morbidity and mortality (M&M) or continuous quality improvement (CQI) conferences (65%), or other case presentations (48%). Only 23% have their residents call back patients. 85% of programs do self-assessments annually. 58% of programs require their residents to do an ED performance improvement project. 96% of programs use M&M or CQI to teach patient safety. Tools used to assess safety are listed in Figure 2. The systems based milestone is primarily assessed by end of shift evaluation forms (54%) or an ED direct observation tool (41%). To assess the use of technology for documentation,

71% use shift evaluations, 27% do chart reviews, and 18% review billing records.

Conclusions: Most residencies have teaching and assessment methods in place for these more challenging milestones, however, a minority of residencies use resources that may be of value to other programs.

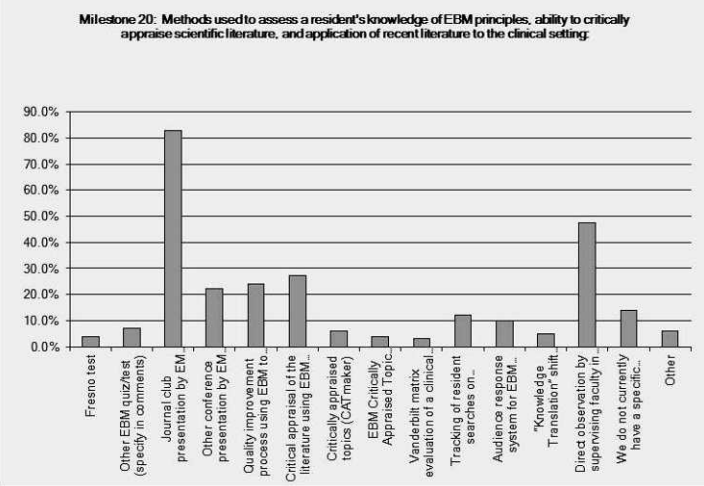

Figure 1.

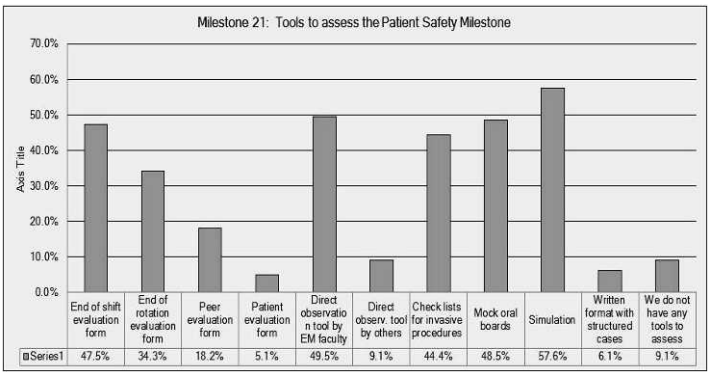

Figure 2.

30 Educating Emergency Medicine Residents about Appropriate Indwelling Urinary Catheter Placement and Management in Older Adults

Mulcare MR, Rosen A, Viswanathan K, Clark S, Flomenbaum N, Stern ME/NewYork-Presbyterian Hospital/Weill Cornell Medical Center, New York, NY

Background: Indwelling Urinary Catheters (IUCs) are placed frequently in older adults in the ED and carry significant risks. To address this patient quality and safety issue, we developed a new evidence-based clinical protocol highlighting appropriate indications for placement, reassessment, and removal of IUCs in the ED.

Objectives: The purpose of this research is to evaluate education of EM residents in appropriate usage of IUCs in older adults.

Methods: We developed a comprehensive, evidence-based educational intervention at a large, university-based medical center, consisting of a 20-minute scripted slide presentation describing the components of the protocol. Written surveys, including 25 unique clinical scenarios each representing possible IUC placement, were administered before and immediately after the intervention.

Results: Forty-seven EM residents participated in this study. Ninety-four percent of residents reported that the intervention made them more comfortable with the appropriate indications for IUC placement. Eighty-five percent reported anticipating that this intervention would reduce rates of IUC use and increase patient safety. After the intervention, residents improved in correctly identifying the appropriate approach to IUC placement in the 25 clinical vignettes (33% before versus 58% after; $p<0.001$). There was an improvement in resident recognition that placement of an IUC is inappropriate in older adults with delirium (2% versus 40%; $p<0.001$) or dementia (6% versus 36%; $p<0.001$). After the intervention, 89% reported intent to increase frequency of IUC re-assessment, 76% reported intent to remove IUCs more frequently, and 89% anticipated that the protocol would be easy to incorporate into practice.

Conclusions: A brief educational intervention on IUC usage in older adults may have a significant impact on EM resident practice. Future research is needed to evaluate the long-term impact of this educational intervention and the evidence-based clinical protocol on patient centered outcomes.

31 EM Resident Education in Provider-In-Triage Operations

London S, Price C, Robinson K/Hartford Hospital, Hartford, CT

Background: In an effort to meet the increasing demand for ED services, many EDs utilize physicians to provide efficient care and decrease door-to-provider times. Providing care in triage differs from the typical ED physician role. Residents who gain experience with provider in triage operations during residency will be better suited to provide in this setting after graduation. A literature review for the last 10 years revealed no sources describing EM residents in a provider-in-triage role.

Objectives: To determine whether a combination of didactic and clinical education could enhance EM residents' knowledge of, and comfort and confidence with, providing care in triage.

Methods: The study design was a pre- and post-education survey. The setting was an academic urban Level I trauma center with 100,000 annual visits. The participants were all PGY 2 and PGY 3 residents at PGY 1-3 EM residency. The education consisted of didactic and clinical experience. The didactic portion consisted of a lecture on ED operations, with a focus on the literature related to efficient provider in triage procedures, and a related reading list of articles. The clinical

experience involved one shift per block in the triage area of the ED. The residents were asked to complete a 6-item pre and post survey using a 5 point Likert scale (1-not confident at all; 5-extremely confident), which asked questions about knowledge of and comfort/confidence with providing care in triage administered after 4 months of experience in this role. Median values and IQRs were calculated for each item and the responses were compared using the Wilcoxon signed-rank test.

Results: Twenty-one of 23 residents completed the pre-survey and 22 of 23 completed the post survey. The survey indicated a significant improvement in knowledge of provider-in-triage operations and increased comfort and confidence in providing care in triage (median increase 2, IQR 1-3, $p<0.001$).

Table 1.

Survey Questions	Median Pre (IQR)	Median Post (IQR)	p-value
I can describe the goals of a provider seeing patients at triage.	1 (1-4)	4 (4-5)	0.0002
I can describe the process of a provider seeing patients at triage.	1 (1-4)	4 (4-5)	0.0002
I am familiar with the literature regarding the use of EM providers at triage.	1 (1-2)	3 (3-5)	0.0001
I feel comfortable providing care at triage.	1 (1-3)	4 (4-5)	0.0001
I am confident in my ability to provide care at triage	1 (1-3)	4 (4-5)	0.0001
I feel prepared to provide care at triage after I graduate from residency	1 (1-4)	4 (4-5)	0.0001
Overall	1 (1-3)	4 (4-5)	<0.0001

32 Emergency Medicine (EM) Faculty Evaluations Do Not Correlate With Performance on a Standardized EM Examination During a Fourth-year Medical Student EM Rotation

Dubosh NM, Peck TC, Ullman E, Fisher J/Beth Israel Deaconess Medical Center, Boston, MA

Background: Emergency Medicine (EM) faculty members routinely evaluate students based on subjective assessment of performance on clinical shifts. These clinical evaluations often play a large role in final rotation grade. The validity of these assessments as a measure of performance is unclear.

Objective: We sought to correlate faculty clinical evaluations with medical student performance on a written, standardized EM exam of clinical knowledge.

Methods: Fourth-year medical students enrolled in a one-month EM rotation at an academic medical center with a three-year EM residency program were evaluated by EM faculty. These evaluations were performed via an online system which applied a 1-5 Likert scale to eight domains: data acquisition, data interpretation, medical knowledge base, professionalism, patient care and communication, initiative/ reliability/dependability, procedural skills, and overall evaluation. At the end of the rotation, students completed the National EM M4 Examination, a standardized exam developed by the Society of Academic Emergency Medicine and Clerkship Directors in Emergency Medicine. Data was collected and analyzed using Microsoft Excel (Redmond, WA) and SPSS 21.0 (Armonk, NY). Means, medians, and standard deviations were calculated and correlations were assessed using a Spearman's rank correlation coefficient.

Results: A total of 39 medical students with 224 discrete faculty evaluations were included. Thirty-three faculty members completed assessments and the median number of evaluations per student was six. The distribution of evaluations is shown in Figure 1. The mean exam score was 78.6%+SD 6.1%. The correlation is shown in Table 1.

Conclusion: Faculty evaluations do not correlate with objective written exam performance. Educators should consider the limitations of subjective and objective assessments of performance. Future studies should focus on the differences and gaps between faculty assessment and objective criterion.

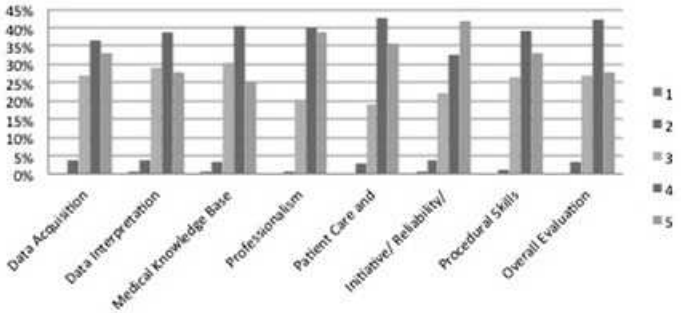

Figure 1. Distribution of Evaluations.

Table 1.

		Data Acquisition	Data Interpretation	Medical Knowledge Base
SAEM Test	Spearman	0.244**	0.301**	0.316**
	Significance	0.000	0.000	0.000

		Professionalism	Patient Care and Communication
SAEM Test	Spearman	0.179**	0.158**
	Significance	0.007	0.018

		Initiative/ reliability/ dependability	Procedural Skills	Overall Evaluation
SAEM Test	Spearman	0.213**	0.074	0.271**
	Significance	0.001	0.271	0.000

33 "Acting" Interns, Assessing When Graduating Medical Students Call for Help, a Simulated Capstone Experience

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

Background: In recent years some medical schools have developed Capstone courses to help prepare medical students to enter residency training. These courses may also provide an opportunity to assess entrustable professional activities.

Objectives: We developed a Capstone experience to assess how often and why graduating medical students call for help when encountering medical emergencies. We hypothesized that student's would call a senior resident (SR) for varying reasons.

Methods: A post-course survey was used to assess how often and why students call for help. We designed 2 simulation cases; acute pulmonary edema with severely elevated blood pressure (SEBP), COPD exacerbation leasing to PEA arrest (COPD). A SR was available for phone consultation, they would respond to the bedside for the COPD case. This case also incorporated a nurse. Students worked in groups of 3.

Results: 46 groups attended the exercise; post-course surveys were completed by groups, not individual students. For the SEBP case, 29 groups (64%, n-45) called the SR. The most common reasons were; assistance with therapeutic management (79%, 23/29), we were in over our heads (38%, 11/29), assistance with diagnostic work-up (31%, 9/29). Seven groups (24%, n-29) felt they should have called sooner. Twenty-eight groups (97%, n-29) noted that the advice changed management. For the COPD case, 24 groups (55%, n-44) called the SR without prompting by the nurse, the nurse prompted 12 groups (27%) to call, for eight groups (18%), the nurse called the SR. The most common reasons were; assistance with therapeutic management (55%, n-44), we-re in over our heads (55%), need for the resident to come to the bedside (48%). Twenty-three groups (52%, n-44) called the SR before the patient went into PEA arrest. Thirty-one groups (71%, n-44) felt they should have called sooner.

Conclusions: When encountering simulated emergencies, graduating medical students will commonly call for help, often for assistance with therapeutic management.

34 Medical Student Educational Resource Utilization During the EM Clerkship

Byrne RG, Saks M, Patel S, Nocera R, Wald D/Cooper Medical School of Rowan University, Camden, NJ; Drexel University, Philadelphia, PA; Temple University, Philadelphia, PA

Background: Medical students access various sources of information during their clerkships. It is unknown which resources are most frequently utilized during the emergency medicine (EM) clerkship and which of them have the most perceived impact.

Objectives: To evaluate resource utilization by medical students during their EM clerkship and to determine the perceived relative usefulness of these resources. We hypothesized that electronic resources would be favored over hardcopy texts.

Methods: We undertook a multi-center survey study of fourth year medical students during their EM clerkship in three urban, tertiary care academic centers over one academic year. Subjects were surveyed at the completion of the rotation to determine the frequency of usage. The impact of each resource was scored on a 10-point Likert Scale.

Results: A total of 181 surveys were completed. For prior rotations, 68% of students reported using smartphone apps for most or all of their patients while only 35% had purchased or borrowed a book for the EM rotation, and only 4% had a subscription to an EM journal.

Subjects reported using each resource for most or all patients as follows: smartphones 46%, Epocrates ® 28%, Up to Date® 24%, Emedicine® 9%, pocket books 21%, review books 10%, online textbooks 15%, hardcopy textbooks 4%.

The resources with the highest impact were: attendings (8.6), residents (8.2), Up to date (7.7), online textbooks (7.5), and smartphones (7.4). Resources with the lowest impact included: other students (5.0), textbooks (6.5), review books (6.3), Google (6.3), and blogs/podcasts (5.3).

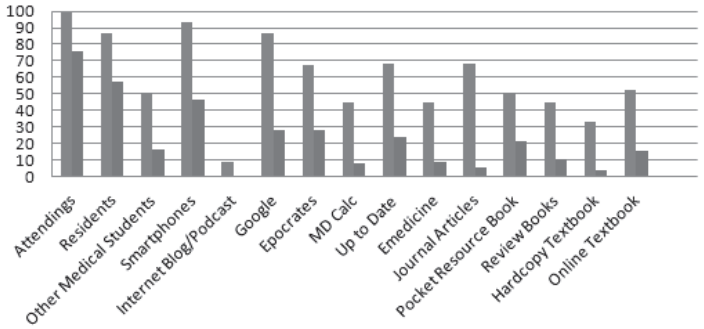

Figure 1. Resource Utilization Frequency.
*Data set 1: % Students utilizing resources
†Data set 2: % Students utilizing resource for "Most" or "All" patients

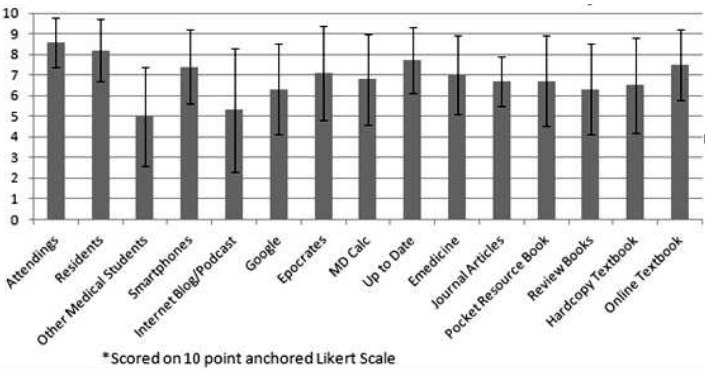

Figure 2. Resource perceived impact shown as Resource Impact Rating.

Conclusions: Electronic resources, especially Epocrates® and Up to Date®, were utilized more frequently and had a greater perceived impact on patient care than any printed books. Attending and resident physicians had the greatest impact. The most important limitation to the study was student recall bias.

35 How Do We Effectively Measure the Milestones?

Hauff SR, Hopson LR, Stansfield B, Perry MA, Santen SA/University of Michigan, Ann Arbor, MI

Background: As emergency medicine (EM) moves to evaluation and reporting of milestones, care must be taken to understand validity issues with assessment tools. The EM milestone evaluation form is a global evaluation with progressive milestones representing levels of expertise. Each level is behaviorally anchored to encourage a more precise behavioral assessment, however the concern is that faculty are continuing to make gestalt global assessments rather than employing the behavior anchors.

Objectives: The purpose of this study was to compare assessments completed by faculty using the standard form with milestones in order and a form where the milestones were randomized, forcing faculty to use the behavior anchors for assessment.

Methods: Nine of the milestones were evaluated. For the randomized form, a random number generator was used to create the order in which the level 1-4 skills were listed. Each faculty completed both forms for each resident. Correlation between the forms was calculated using Intraclass Correlation Coefficients.

Results: 20 residents were evaluated by 34 faculty. Inter-rater reliability for the standard evaluation was near-perfect (0.96-0.99) indicating that faculty were assigning a global gestalt rating and not making expert assessment judgments. Inter-rater reliability for the randomized form was poor (-0.05-0.68). Rating variance between the ordered and randomized was the same for each milestone evaluated.

Conclusions: Given these results, it is likely that by tethering these discrete skills to a developmental continuum, performance information is actually lost. This suggests that our current evaluation tool is not being utilized correctly, and is probably not measuring the discrete behaviors we are interested in. Treating the milestones as a continuum may actually be taking away information, as faculty are not thoughtfully rating residents and instead place them at the point where they "should" be based on post-graduate year.

36 Medical Student Clinical Decision Rule Utilization During the EM Clerkship

Byrne RG, Saks M, Patel S, Nocera R, Wald D/Cooper Medical School of Rowan University, Camden, NJ; Drexel University, Philadelphia, PA

Background: Many clinical decision rules (CDR) exist to aid EM physicians in the testing, treatment, and admission of patients. It is unknown to what extent 4th year medical students are exposed to CDRs or how students view their impact on medical decision making (MDM).

Objectives: To evaluate medical student consideration of common emergency medicine CDRs and to measure the perceived impact these CDRs have on MDM. We hypothesized that these results would demonstrate significant opportunities to better educate students regarding the application of CDRs to guide appropriate resource utilization in the Emergency Department.

Methods: This was a multicenter survey study of 181 fourth year medical students during their EM clerkship in three urban, tertiary care academic centers. Subjects were surveyed at the completion of their 4 week rotation on whether they had evaluated a patient with a complaint covered by a pertinent CDR. Subjects were asked if they had considered the rule, and then ranked the impact of the CDR on a 10 point Likert scale.

Results: The percentage utilization and mean Likert scores for each CDR were: San Francisco Syncope rule 33% (7.7), Pneumonia Severity Index 57% (6.9), Ottawa Knee Rule 60% (7.3), Ottawa Ankle Rule 83% (7.8), Centor Criteria 73% (7.5), Wells Criteria (DVT) 84% (7.8), Wells Criteria (PE) 95% (8.0), PERC rule 63% (8.0). For patients with head injuries, students considered the Canadian head CT rule 40% (7.7), New Orleans head CT rule 13% (6.0), and neither 46%. For patients with possible cervical spine injuries, students considered NEXUS criteria 80% (8.3), Canadian C-spine rule 43% (7.3), and 7% neither.

Conclusions: All CDRs were rated as having a high impact on patient care. However, students did not consistently consider CDRs where applicable. There are significant opportunities to better educate students regarding the use of CDRs during the EM rotation. The most significant limitation to this study was student recall bias.

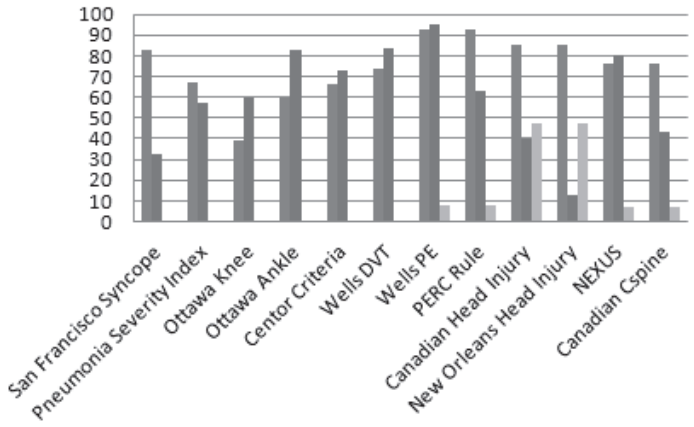

Figure 1. Clinical decision rule utilization.
*Data set 1: % Students seeing pt where CDR applicable
†Data set 2: % CDR utilization
‡Data set 3: % neither of 2 CDRs considered

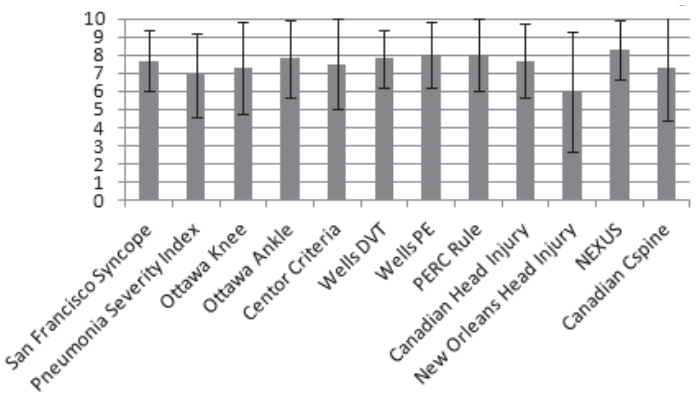

Figure 2. Clinical decision rule perceived impact Likert scores

37 An Analysis of Emergency Department Shift Evaluations to Determine Infrequently Assessed Milestones – A Preliminary Report

Baker AD, Baker SY, Bondani KJ, Silvestri S/Orlando Health, Orlando, FL

Background: The Milestones Project is a joint initiative of the Accreditation Council for Graduate Medical Education and the American Board of Emergency Medicine, designed to assess the acquisition and progression of competency-based outcome expectations for Emergency Medicine (EM) residents. Many residency programs use standardized shift evaluations to gather milestone-related data.

Objectives: To determine which milestones for Emergency Medicine are infrequently evaluated in the Emergency Department (ED) clinical setting.

Methods: We gathered shift evaluations of 43 residents in a PGY I-III EM residency program from July - October 2013. For each milestone on an evaluation, faculty had identified the item as either "not applicable" or observable ("yes" or "no"). For each milestone, the proportion of evaluations returned as "not applicable" was tabulated. Milestones that met the a priori threshold of >50% "not applicable" were identified as infrequently observed in the ED clinical setting.

Results: The data set included 9730 ratings of 96 EM milestones. Eleven milestones were identified as exceeding the 50% threshold for being evaluated as "not applicable" in the ED clinical setting (Table 1).

Conclusions: Our study identified a specific list of milestones that are difficult to observe in the ED clinical setting. In order to observe these milestones throughout an EM residency, additional methods of evaluation should be developed. Simulation cases, mock-patient encounters, knowledge-based examinations, and off-service evaluations may provide additional opportunities to demonstrate performance.

Table 1. Infrequently Observed Milestones.

Competency	Subcompetency	Milestone Level	Milestone	% Not Applicable (N/A) - all residents	%N/A PGY1	%N/A PGY2	%N/A PGY3
Patient Care	Emergency Stabilization (PC1)	4	Recognizes in a timely fashion when further clinical intervention is futile	52%	-- *	53%	52%
Systems-based practice	Systems-based Management (SBP2)	4	Participates in processes and logistics to improve patient flow and decrease turnaround times (e.g., rapid triage, bedside registration, Fast Tracks, bedside testing, rapid treatment units, standard protocols, and observation units	56%	-- *	54%	57%
Patient Care	Emergency Stabilization (PC1)	4	Integrates hospital support services into a management strategy for a problematic stabilization situation	60%	-- *	63%	56%
ICS	Patient-centered Communication (ICS1)	2	Negotiates and Manages simple patient/family-related conflicts	64%	82%	65%	49%
Professionalism	Professional Values (PROF1)	3	Develops alternate care plans when patients' personal decisions/beliefs preclude the use of commonly accepted practices	65%	71%	63%	62%
Systems-based practice	Systems-based Management (SBP2)	2	Participates in patient satisfaction initiatives	65%	72%	67%	56%
Professionalism	Professional Values (PROF1)	4	Effectively analyzes and manages ethical issues in complicated and challenging clinical situations	72%	-- *	81%	65%
Systems-based practice	Patient Safety (SBP1)	3	Employs processes (e.g., checklists, SBAR), personnel, and technologies that optimize patient safety	72%	70%	89%	61%
Professionalism	Accountability (PROF2)	4	Manages medical errors according to principles of responsibility and accountability in accordance with institutional policy	86%	-- *	91%	82%
Patient Care	Emergency Stabilization (PC1)	3	Evaluates the validity of a DNR order	89%	100%	94%	80%
Systems-based practice	Patient Safety (SBP1)	4	Leads team reflection such as code debriefings, root cause analysis, or M&M to improve ED performance	90%	-- *	97%	84%

*These items were not present on the standardized shift evaluations for PGY1-level residents

38 The Influence of Anonymity on Resident Evaluations

Hauff SR, Hopson LR, Perry MA, Hill D, House JB, Carney M, Sozener CB, Santen SA/University of Michigan, Ann Arbor, MI

Background: Learners desire timely, constructive and explicit feedback. While anonymous, global monthly evaluations with composite comments have been used by our program as an evaluative tool, they may not be trusted due to the lack of identification of the evaluator. However, identified evaluations may compromise in other ways.

Objectives: To determine whether transitioning from anonymous to identified evaluations would result in changes to the quality of the evaluation provided. We also sought to characterize perceptions of evaluations on the part of trainees and faculty.

Methods: In a pre/post comparison, we evaluated 1 month of anonymous and 1month of identified evaluations . We examined: number of evaluations and comments, faculty participation, and milestone level assigned. We scored comments by: not actionable (generic or excessively vague) or actionable (specific or constructive). Residents and faculty were surveyed regarding their opinion of the evaluation process.

Results: Evaluations completed (142 anonymous versus 130 identified) and faculty participation (26 versus 25) did not change. When identified, faculty did not inflate the milestone level assigned (0.13 SD 0.40). Total number of words did increase ((12.0 SD 16.3) versus (21.2 SD 29.0)), though there was little difference in comment quality. Residents (n=43, 80% response) and faculty (n=34, 52% response) surveys revealed significant differences in perception of evaluation accuracy, concordance with verbal feedback and perception of constructiveness, with faculty rating more positively ($p<0.05$).

Conclusions: Concerns that identification of the evaluator would compromise content and participation were not born out in pre/post comparison. Long-term effects on faculty-trainee relationships will need further assessment as there are significant differences in the perceptions of the evaluation process and the impact of the transition from an anonymous to identified system.

39 A Comparison of the Effectiveness of Daily Shift Evaluations with Biannual Evaluations of Residents in an Emergency Medicine Training Program

Governatori NJ, Wong T, Clark M/St. Luke's / Roosevelt Hospital, Mount Sinai, New York, NY

Background: Despite many different methods to deliver feedback there is currently no standardized evaluation tool for residents in Emergency Medicine training programs.

Objectives: To determine if daily shift evaluations are more effective than biannual sit down evaluations in providing feedback and education to residents.

Methods: At our program daily shift evaluations were implemented using an online Web-based evaluation system. Two months later, residents and attending physicians were given an online survey based on a 5-point Likert scale to gauge whether or not the daily evaluations had a significant impact on training as compared to the prior evaluation system, which occurred biannually.

Results: Thirty-two residents and 16 attendings participated in the survey. Mean and median scores were calculated for each individual question and then paired student t-tests were performed to determine significance at 95% confidence intervals. Overall, both residents and attendings preferred daily shift evaluations to biannual evaluations ($p<0.05$) and felt that they provided more specific feedback ($p<0.05$). In addition, attendings felt that daily shift evaluations facilitate resident grown more than biannual evaluations. The remaining questions addressing increased time spent reading, improved procedural skills, better patient presentations, negative interactions with attendings, and change in daily practice did not achieve statistical significance. All of the mean responses, however, slightly favored daily shift evaluations.

Conclusions: Electronic daily shift evaluations are preferred and do not appear to have a negative impact on the work environment. Residents feel they receive more specific feedback; however, their daily practices have not changed significantly. Further data are required to see if daily shift evaluations will translate to improved measurable outcomes in national in-service exam, clinical performance and patient care.

40 Assessment of Knowledge and Attitudes about Healthcare Disparities among Students, Residents, Staff and Patients in the ED

Igbokwe L, Lee BI, Moreno-Walton L/Louisiana State University Health Sciences Center- New Orleans, New Orleans, LA

Background: National data continues to demonstrate that minorities have poorer outcomes from preventable and manageable diseases. The Institute of Medicine attributes this disparity to health care provider bias.

Objective: Assess the knowledge and attitudes among various levels of providers and patients about healthcare disparities.

Method: A convenience sample of 25 people in six categories (attending, resident, student, nurse, ancillary staff, patient) was surveyed using a 16 item instrument. Chi square test, simple means and proportions were used to analyze data at a 5% significance level.

Results: Based on overall score of correct survey answers, attending physicians are most knowledgeable about

healthcare disparities, followed by residents, nurses, students, ancillary staff, and patients (p=0.0013). Patients indicated awareness of provider bias, but did not connect this to poorer outcomes (p=0.0917). In all categories, Blacks are twice as likely as Whites to acknowledge provider bias against minority patients (p=0.0135).

Conclusion: Curricula need to address not only the existence of provider bias, but the connection to poorer outcomes. There is a role for patient education about this association so that patients are empowered as self-advocates.

41 Utilization of the National EM Medical Student Exam in EM Clerkships

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Background: More than half of U.S. medical schools have a required EM clerkship with the majority occurring during the fourth year of medical school. Most utilize an end of rotation examination as a component of assessment. The National Emergency Medicine Fourth-Year Medical Student Exam was released to assess the Clerkship Directors in Emergency Medicine curriculum for M4 students in a required EM clerkship in July 2011.

Objective: To describe the utilization of the EM Medical Student Exam in EM clerkships.

Methods: Demographic data were collected by a survey administered to clerkship directors utilizing the EM M4 Exams at the time of exam confidentiality certification from July-October 2013.

Results: Twenty-five programs completed the survey. Twenty percent administer the exam to M3 students, 88% administer to M4 students, and 4% administer to PA students. Sixty-three percent of institutions administer it to students on an M4 elective rotation, 44% an M4 required rotation, 15% an M4 selective, 20% an M3 elective, and 4% an M3 selective. Forty-four percent require a minimum passing score on the exam in order to pass the clerkship. Considerable variation exists in how much the exam contributes to the final clerkship grade, ranging from "no specific percentage (must pass the exam)" to as high as 30%. The exam score contributes 21-30% of the final grade in 36% of clerkships, 11-20% in 20% of clerkships, and 1-10% in 20% of clerkships. Eight percent of clerkships only require a passing exam score, in addition to other requirements, for successful clerkship completion. A variety of teaching methods are used, including lectures, small group discussion, simulation, CDEM online modules, and assigned readings for exam preparation.

Conclusions: The EM M4 Exam is being administered predominantly to M4 students with significant variation in grade and rotation completion impact. A higher than expected amount of clerkships administer the exam to M3 students. These data may inform interpretation of exam performance.

42 A Real "Push" for Medical Education: A Pilot Comparison Between SMS Texting and Email for Emergency Medicine Residents' Knowledge Retention

Hoonpongsimanont W, Patierno S, Costantini S, Chakravarthy B/University of California, Irvine, Irvine, CA

Background: Technological advancements have generated many new methods of information distribution. Email and SMS texting are types of "push" technology utilized by educators. SMS texting is effective in patient education but has yet to be firmly utilized in graduate medical education. If effective, this may enhance health professionals' learning and retention of information.

Objectives: To evaluate the knowledge retention of information delivered via bi-daily text messages as compared to a single e-mail to emergency medicine (EM) residents.

Methods: This is a prospective, randomized controlled study in an ACGME accredited academic center. Sixteen EM residents were randomized within each year of training into two groups to receive educational information via a twice-daily text message (n=7) or a one-time email handout (n=9). Knowledge retention was assessed with a 30-question test administered two weeks before and after information delivery. Data was analyzed using t-test analysis. The study received IRB approval.

Results: The average level of education was a second year EM resident. Between the two groups, the mean age was similar, with males more prevalent than females. In the SMS text group, the mean pretest score was 75.46 and the post-test score was 76.19. In the email group, the mean pretest score was 77.49 and the post-test score was 71.47. Results showed that the mean post-test score in the text group increased 0.73 (95% CI -11.80 to 13.26) when compared to the pretest score, whereas the mean post-test score in the email group decreased 6.02 (95% CI -10.99 to -1.06) from the pretest score (p=0.21). Test scores showed a trend in improvement in the text group compared to the email group.

Conclusions: The preliminary study results illustrate that SMS text messages show a promising trend in improving knowledge retention and may possibly be a valuable education tool for graduate medical education.

43 Impact of Novice and Advanced Assistants on Clinical Efficiency of Emergency Physicians

Wei G, Xu HF, Arya R, Ohman-Strickland P, McCoy JV/ Rutgers - Robert Wood Johnson Medical School, New Brunswick, NJ

Background: EM physicians operate as a team with assistance from students, physician assistants (PA), residents and other health care providers. A concern is how novice and advanced assistants impact the clinical efficiency of physicians.

Study objective: We hypothesize that advanced assistants will positively impact inefficient physicians more than efficient physicians, while novice assistants will negatively impact inefficient physicians more than efficient physicians.

Methods: This was a retrospective review of EM attending physicians' clinical efficiency with no assistant, a novice assistant (medical/PA students or EM interns), or an advanced assistant (PA or EM residents). The ED electronic medical record was reviewed for a year at an urban level 1 trauma center with a new EM residency. Clinical efficiency was defined as ED length of stay (LOS) for discharged patients. Mixed linear models compared log-transformed LOS between patient visits with and without assistants, on average, and differences in these effects among physicians.

Results: Nineteen physicians covering a total of 44,839 discharged patient visits were included for analysis. With novice assistants, LOS was 60% longer (95% CI: 44%, 77%) compared to no assistant, with similar results for 17 of the 19 physicians, while 2 physicians had essentially no change. LOS with advanced assistants was not different from no change (95% CI: -11%, 8%); however, there was significant variation among physicians. 6 physicians saw significant increases, 4 saw significant decreases, and 10 saw no change in their LOS. The 6 physicians with significant increases also had some of the shortest median LOS with no assistants, while those with decreases were physicians who had the longest median LOS with no assistants.

Conclusion: Novice assistants almost uniformly reduced attending physician efficiency, while advanced assistants decreased the differences between more and less efficient physicians.

44 Utility of a Competency-based EM Dean's Letter

Sozener CB, Hopson LR, House JB, Dooley-Hash S, Hauff SR, Lypson ML, Santen SA/University of Michigan, Ann Arbor, MI

Background: EM Milestones guide training from end of med school through residency. It is unclear how well prepared med school grads are to meet level 1 milestones. It is not yet resolved where responsibility for ensuring level 1 competency of graduates falls. Currently the dean's letter or MSPE is inadequate to confirm level 1 milestone achievement.

Objectives: We attempt to determine value of a milestone-based competency assessment given to program directors (PDs) of incoming EM residents as a second MSPE. We hypothesize this would be beneficial to PDs to customize training.

Methods: An ad hoc EM Competency Committee (clerkship and residency leadership and med school assistant deans) was formed. Multiple assessments and performance data were utilized from EM clerkship, multi-station summative clinical exam, and EM procedures elective to assess competency of level 1 milestones of graduates entering EM. Nearly all milestones could be assessed. Resultant data were utilized in 2 phases. In Phase 1 (P1), individual assessments were sent (with permission) to their future PDs. In Phase 2 (P2), a representative assessment of a graduating student entering EM was sent to all PDs. Surveys to assess utility were sent in each phase.

Results: Surveys completed to date in P1 is 3 (50%) and P2 is 43 (39%). In P1, 33% of PDs were somewhat dissatisfied with utility of the MSPE in judging achievement of level 1 milestones; 16% of those in P2 were somewhat and 37% very dissatisfied. 100% of P1 PDs and 81% of P2 said they do not use the MSPE to customize training. 66% in P1 and 86% in P2 felt the proposed assessment would provide new detail over the MSPE. 100% of P1 PDs and 90% of P2 felt the proposed assessment would be useful for all incoming interns.

Conclusions: Surveyed PDs felt the proposed assessment would provide new data over the MSPE and would be useful to help customize training. Remaining surveys are being actively collected and similar results are expected.

45 Survey Investigation Examining Attitudes toward and Knowledge about HIV Testing among Medical Students, Residents, Staff and Patients in the ED

Brown L, Johnson G, Moreno-Walton L/Xavier University, New Orleans, LA; Louisiana State University Health Sciences Center- New Orleans, New Orleans, LA

Background: The CDC currently recommends routine HIV testing of all patients presenting to the ED. We hypothesize that most medical students, EM residents and faculty are not aware of this standard of care and have knowledge gaps about HIV testing and counseling.

Methods: Survey investigation examining attitudes toward and knowledge about HIV testing in the ED of an urban teaching hospital. A random convenience sample of 150 people; 25 in each of 6 cohorts (attendings, residents, nurses, ancillary staff, medical students, patients) took an anonymous 15 item survey. Data was analyzed using simple percentages and chi square test. Critical value was set at 11.070, 5 degrees of freedom and alpha=0.05. Odds ratios were calculated with a 95% confidence interval.

Results: Physicians were more likely to answer knowledge based questions correctly. Overall, residents averaged the highest percent correct. Percentages of nurses and ancillary staff answering these questions correctly were as low as 36.0% and 24.0%, respectively. Nurses sometimes scored lower than patients on knowledge based items. Profession was found to have a significant ($p<0.05$) association on 50% of the knowledge based questions, as well as all questions regarding HIV testing habits. Eighty-eight to 92% of all cohorts have ever been tested for HIV, with the exception of medical students (52%). Patients and ancillary staff have been tested more recently than physicians and students.

Conclusions: In this urban ED, residents were best informed about HIV, but least likely to follow CDC testing recommendations. Nurses showed a generally low level of knowledge, corresponding to low likelihood of compliance with testing recommendations. Patients and ancillary staff had intermediate knowledge, but were most likely to comply with testing recommendations. By identifying gaps in particular segments of the surveyed population, future education programs can be created and tailored for each group.

46 Evaluation of Social Media Utilization by Emergency Medicine Resident and Faculty

Pearson D, Bond M, Kegg J, Pillow T, Hopson LR, Cooney R, Garg M, Khadpe J, Runyon M, Patterson L/ Carolinas Medical Center, Charlotte, NC; University of Maryland, Baltimore, MD; Southern Illinois University, Springfield, IL; Baylor College of Medicine, Houston, TX; University of Michigan, Ann Arbor, MI; Conemaugh Memorial Medical Center, Johnstown, NY; Temple University, Philadelphia, PA; SUNY Downstate Medical Center, Brooklyn, NY; Carolinas Medical Center, Charlotte, NC; East Carolina University, Greenville, NC

Background: Clinicians and residency programs have begun to use social media (SM) websites for educational and promotional uses, yet little is known about the current practice of SM by residents and faculty.

Objective: To identify differences in personal and professional SM use by emergency medicine (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 CORD listserv. Descriptive statistics including the chi-square test or Fisher's exact test were determined. StatsDirect software (v 2.8.0, StatsDirect, Cheshire, UK) was used for all analyses.

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), 21% assistant or associate PDs, 45% core faculty, and 19% other faculty] with 44% having completed residency more than 10 years ago. For personal use, residents used SM markedly more than faculty for social interaction with family/friends (83% versus 65%, $p<0.0001$), entertainment (61% versus 47%, $p<0.0001$), and videos (42% versus 23%, $p=0.0006$). Residents used Facebook and YouTube more often than faculty (86% versus 67%, $p<0.001$; 53% versus 46%, $p=0.01$), whereas residents used Twitter (19% versus 26%, $p=0.005$) and LinkedIn (15% versus 32%, $p<0.0001$) less than faculty. Residents overall use SM sites more than faculty, notably in daily use (30% versus 24%, $p<0.001$). For professional use, residents were most interested in its use for open positions/hiring (30% versus 18%, $p<0.0001$) and videos (33% versus 26%, $p=0.005$) and less interested than faculty with award postings (22% versus 33%, $p<0.0001$) or publications (30% versus 38%, $p=0.0007$).

Conclusion: SM personal utilization patterns and interests in professional use are different between EM residents and faculty. Awareness of these varied utilization patterns may benefit future educational endeavors.

47 Evidence-based Medicine: Is There a Better Journal Club Format?

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Background: The ability to practice evidence-based medicine is necessary to the practice of Emergency Medicine and is a skill set acquired during residency. Journal clubs have long been a venue for learning critical appraisal skills and understanding biostatistical concepts, but an ideal format has not been clearly established.

Objective: The objective was to determine if a new journal club format increased resident satisfaction and self-perceived ability to interpret the literature.

Methods: This was a retrospective observational study undertaken at a PGY1-3 emergency medicine residency program. In June 2011, journal club was changed from a one-hour session at the weekly academic conference to a 2-part journal club. This included a 30-minute biostatistical concept introduction at weekly academic conference followed by an evening journal club held at a faculty member's home. After 6 months, all residents were surveyed to evaluate perceived change in their ability to interpret medical literature, their satisfaction with the new format and their reasons for attending journal club.

Results: Of the 25 residents enrolled in the residency program, 100% chose to participate in the survey. Reported journal club attendance increased from n=17 to n=20. All of the residents who attended the new journal club format reported that they were either moderately or very satisfied, whereas only 20% (n=5) reported this for the old format. Residents reporting being moderately or very satisfied with

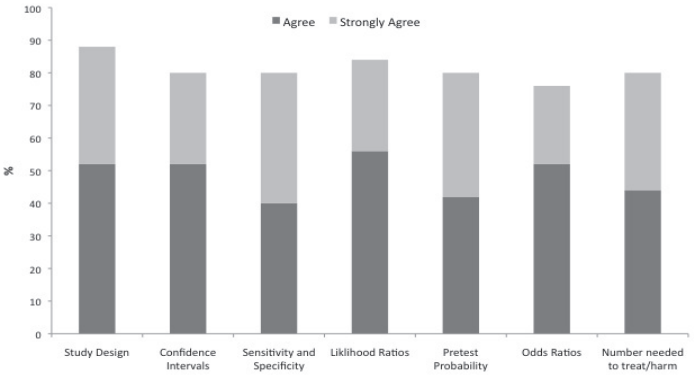

Figure 1. Resident's reported improved understanding of statistics concepts.

their ability to interpret the medical literature increased from 32% (n=8) to 88% (n=22).

Conclusions: The implementation of a two-session biostatistical concept-based journal club format improved resident attendance, satisfaction and perceived ability to interpret the literature.

Table 1. Top 5 reasons for attendance.

	Responses (n)
Increased knowledge of biostatistical concepts	96% (24)
Social atmosphere	92% (23)
Increased ability to interpret the literature	68% (17)
Overall team building	44% (11)
Faculty-resident collaboration	32% (8)

48 MERC PROJECT: A Deliberate Practice Didactic Successfully Increased Resident Follow Up of Patients by Telephone

Omron RM, Van Meter M, Fredette J, Prepeichal R, Conlon LW, Doshi A, Peng LL, Hsieh YH, Hoon CJ, Kuhn G/Johns Hopkins University School of Medicine, Baltimore, MD; The University of Texas Health Science Center at Houston, Houston, TX; Christiana Care Health System, Newark, DE; Saint Joseph Mercy Health System, Ann Arbor, MI; University of Pennsylvania, Philadelphia, PA; University of Pittsburgh School of Medicine, Pittsburgh, PA; National University of Singapore, Singapore; Wayne State University, Detroit, MI

Background: Follow-up of discharged patients provides valuable insight into misdiagnosis and gives an opportunity for self-reflection as a means of preventing errors. Dispositioned patients are a unique population at risk for medical error, therefore increasing follow-up in this population may be valuable.

Objectives: Improve resident understanding of deliberate practice as a means of achieving expertise in emergency medicine and increase the number of follow-ups residents perform as a consequence of their understanding how follow-up improves mental cognition.

Methods: A seven residency multicenter pre and post didactic study as part of the MERC at CORD group. Study population was a convenience sample of residents who attended a didactic presentation from March 2013 to July 2013. The didactic taught the importance of deliberate practice and follow-up. During small groups, residents described interesting case follow-ups with a faculty mentor. Interesting cases were then shared with the group. This study was powered to show an increase in follow ups from 20 to 40 follow-ups a year.

Results: Two sites were excluded from the study - one due to lack of IRB approval and the other for inability to collect post test data. The number of follow-ups did not change significantly. Residents had a significant increase in telephone follow-ups (<20% to >20; p=0.04), which also significantly increased requests for patient return to the ED (p=0.02). Most residents agreed that follow-up is important, and reported better understanding of deliberate practice (p=0.001).

Conclusions: Residents do see a value to performing patient follow ups but the majority of these follow-ups are done by chart review and therefore on the admitted population. Few residents contact by telephone patients who have been discharged. After this didactic, residents were more likely to contact patients by telephone for follow-up. Additionally, residents more often requested patient return if needed.

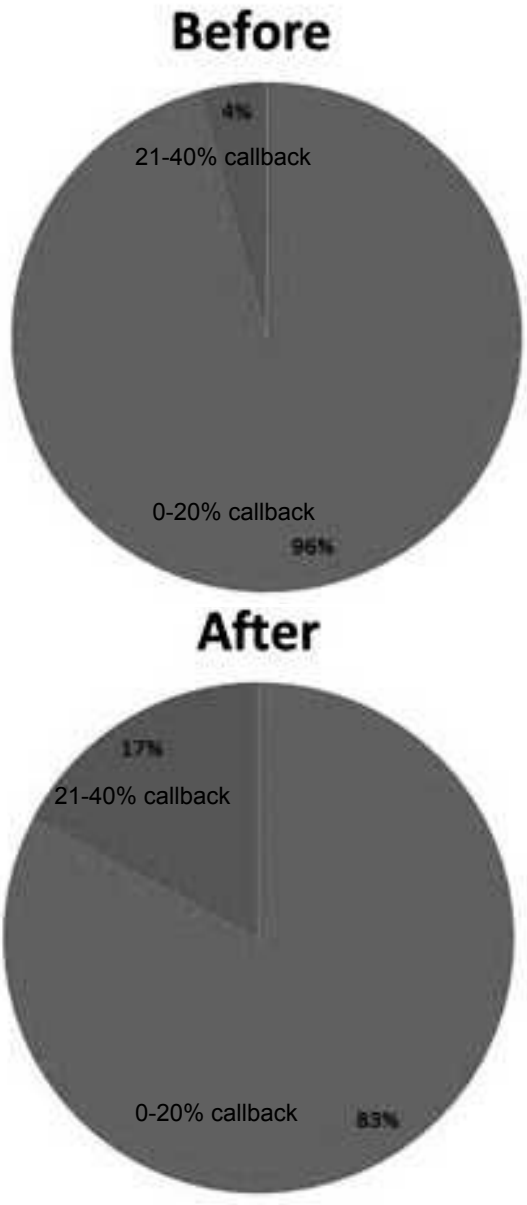

Figure 1. Percentage of resident callbacks pre/post intervention.

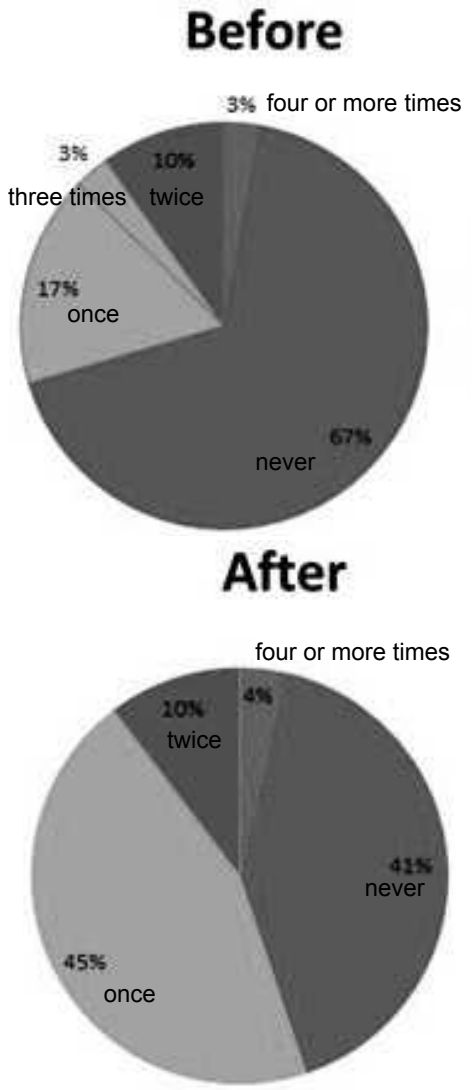

Figure 2. Frequency of request for patient return pre-post intervention.

49 Development of an Elective Rotation in Observation Medicine

Pease J, Velez L/UT Southwestern Medical Center, Dallas, TX,

Objectives: To describe a new rotation in observation medicine (OM) for emergency medicine (EM) residents.

Background: According to the American College of Emergency Physicians (ACEP) approximately 36% of emergency departments (EDs) have a dedicated observation unit (OU). Only a third of EM programs have observation units. Of those, only 9.8% of programs have a required rotation. The Model for the Clinical Practice includes observation medicine as part of the training requirements. This rotation is based at the EDOU at Parkland Memorial hospital, which contains 25 beds in close proximity to the ED. There are just over 9000 admission per year with an approximately 10% conversion to full admission rate. The average length of stay is approximately 18 hours.

Methods: We developed a 4-week elective rotation for senior residents in the EDOU. The unit is staffed by nurse practitioners (NPs), supervised by EM faculty, who round twice a day. The rotation includes clinical rounds with the EDOU medical director and EM faculty (Monday through Friday).It also requires readings from book chapters and relevant literature. The residents are involved in the Continuous Quality Improvement (CQI) activities for the unit, and a performance improvement project. The EM resident is required to attend both hospital-based and departmental-based meetings surrounding the EDOU thus exposing them to them to the administrative aspect of OM.

Results: Two senior residents undertook the rotation in the first year it was offered. They were very satisfied with the experience and they all completed the requirements.

Conclusion: An elective in OEM is a viable and useful alternative for EM residents. In the future, such a rotation should be mandatory, as more of these units develop across the country and EM graduates are required to have the skill set to practice in this setting. The unit allows for interaction between residents and physician extenders, another area in which the residents gain useful education.

50 A Novel Approach to Internal Medicine Education for Emergency Medicine Residents

Gemme SR, Cohn J, Smith J/Rhode Island Hospital-Alpert Medical School of Brown University, Providence, RI

Background: Internal medicine topics must be mastered by every emergency medicine resident. The most effective method to complete this is uncertain, and traditional internal medicine floor rotations have received mixed reviews by residents at our institution. We employed a new curriculum to educate these topics with the Internal Medicine Follow Up rotation.

Intervention: The Internal Medicine Follow Up rotation replaces the internal medicine floor rotation with an emergency department based approach. Interns log all admitted patients and follow up on further diagnostic tests, treatment, and ultimate disposition. Several times during the rotation, the intern rounds with an emergency medicine attending on the admitted patients to discuss internal medicine topics. At the completion of the rotation, the intern gives a presentation to the residency program on an internal medicine topic of interest. A six-question survey was sent to the interns to gather objective data on the overall quality of the rotation.

Results: Ten of the 12 interns completed the survey. Ninety percent of the interns indicated that the rotation was a more valuable rotation compared to an internal medicine floor. The overall quality of the rotation and availability of the teaching physician were both rated as adequate or above.

Conclusions: Our intervention offers an alternative and possibly more effective method to teach emergency medicine residents internal medicine topics.

51 March Into Residency: Learning to Become a House-Officer

Paolo WF/SUNY Upstate, Syracuse, NY

Introduction: New interns are frequently unprepared for the challenge of the transition from student to house-office due to the lack of a formal preparatory curriculum at the undergraduate medical level. Many residencies spend their initial contact month with interns utilizing individualized curricula in order to compensate for the variability in clinical and practical education. The purpose of this course is the preparation of fourth year medical students to assume their roles as house officers by providing them with a broad overview and approach to the most commonly encountered clinical scenarios as well as the ethical and legal responsibilities of house officers. The goal is to be able to provide GME programs with an initial milestone evaluation based upon course performance.

Educational Objectives: 1. Enhance the ability of the learner to generate a differential 2. Improve history and physical skills through didactics and small group sessions 3. Demonstrate basic procedural skills in small group procedure 4. Interpret diagnostic peripheral testing including but not limited to common radiographs, EKG, and basic laboratory values. 5. Understand the most common professionalism pitfalls 6. Recognize the responsibility of the physician mandatory reporting, DNR/I, and billing and coding

General Structure: The curriculum is modular following a pattern divided into chief complaint based sessions and non-clinical sessions (e.g., social media). Each chief complaint day is broken into the following components an introductory didactic session (25 minute lectures), a 1 hour journal club, and break out sessions (simulation, procedure labs, ancillary testing interpretation groups) to total five hours per session. Two days serve as specialty breakout days in which students spend an 8 hour lead by GME program directors.

Effectiveness: The course is beginning in March for its first iteration and has been accepted by the entirety of the SUNY Upstate GME community.

52 Teaching to Learn, Learning to Teach: Turning Our Residents Into Effective Educators

Paolo WF, Weidman T/SUNY Upstate, Syracuse, NY

Introduction: Throughout residency it is expected that residents function as effective educators both clinically and didactically. In spite of the importance of this role few residencies undertake the job of formally educating residents in the science of adult learning theory and mentorship. Clinical precepting as well as didactic lecturing are skills that can be taught rather than indirectly modeled through pure mentorship. The TLLT curriculum endeavors to train residents to act as educators in all facets of emergency medicine education.

Objectives: 1. Enhance the ability of the learner to act as a clinical preceptor 2. Improve didactic lecturing skills 3. Demonstrate the ability to provide feedback to medical students. 5. Understand the basics of adult learning theory 6. Demonstrate a basic understanding of the science of didactic and clinical education.

General Structure: The curriculum is given as a four week rotation in which the resident receives specific instruction in all facets of emergency education including clinical mentorship, providing feedback, generating a lesson plan, and providing a lecture. Residents are expected to read prepared materials and are given formal training via direct mentorship regarding the learning objectives. The resident is assigned teaching shifts within the emergency department in which they are assigned third year medical students to precept and educate. Each month also includes simulation time in which the resident oversees clerkship students running through basic case scenarios in the laboratory. In addition it is expected that the learner will provide two 25 minute lectures including an assigned "clinical controversy" that the learner is expected to solve utilizing current medical literature.

Effectiveness: The course has run for 1.5 years and has been recognized as a "best practice" within the SUNY Upstate GME. Both medical student and resident feedback has been universally positive.

53 Assessment of Emergency Medicine Resident Competency in the Care of an Infant with Respiratory Distress – Mapped to EM Milestones

Pasternack J, Spillane L/University of Rochester, Rochester, NY

Introduction: Competency based assessment (CBA) for the care of critically ill children in the clinical setting is challenging. A simulated patient experience allows faculty to assess clinical skills through a standardized case designed for residents to demonstrate diverse skills over a wide range of complexity.

Educational Objectives:

1. Develop CBA linked to the EM Milestones for the evaluation and management of an infant with respiratory distress

2. Create a standardized simulation scenario with enough complexity to allow residents to demonstrate skills across a range of Milestone competencies and levels

Curriculum design: Faculty developed a scenario of an infant with respiratory failure due to pertussis, complex enough to perform skills at Levels 1-4 across 8 milestones. A CBA tool was developed with case-specific criteria within

the domains of these milestones: emergency stabilization, performance of focused physical exam, diagnostic studies, diagnosis, pharmacotherapy, observation and reassessment, airway management, and team management.

Residents were paired and assisted by a confederate nurse. Teams had 15 minutes to manage the simulated patient and were assessed by two faculty members in real time. Final ratings were determined through a consensus process.

Impact/Effectiveness: All 36 residents were assessed with this case during their annual OSCE. Most residents performed at their expected level for year of training with a few high and low scorers in each PGY level.

The standardized case with case-specific descriptors allowed faculty to efficiently evaluate performance of these critical skills that would be challenging to assess in the clinical setting. Communication and thought process was more evident because residents were assessed in teams. Creating a structured debriefing to explore underlying decision-making skills and management choices may have provided additional input for level of competency.

54 The Development and Implementation of an Online Discussion Board for Emergency Medicine Clerkship

Nguyen ST, Jauregui J, Shandro J, Strote J/University of Washington, Seattle, WA

Introduction/Background: Our required fourth-year emergency medicine clerkship involves hundreds of students rotating in five states at both academic and community sites. The use of online discussion boards has the potential to connect isolated students in disparate learning environments, creating collaboration as it applies to social learning, providing scaffolding for self regulated learning and being learner centered as an adjunct to online didactics. Social learning and self-regulated learning enhance student education, and learner centered environments may increase long-term retention.

Educational Objective: Develop and implement an asynchronous learning tool that fosters peer communication, allows for self-regulated learning, and creates a community for students in different locations.

Curricular Design: An online discussion board was developed to supplement a multifaceted clerkship educational program. Emphasis was made on exposure to medical literature and facilitating discussion. Each week, after viewing a recorded lecture online, students perform a Medline search to answer a question related to the lecture content. Citing at least one study, they are required to post the question and the answer they found. They must also respond to at least one other posting each week.

Impact/Effectiveness: In the first year of implementation, all students successfully participated in the discussion board. From evaluations, 85 anonymous comments about the discussion board were recorded. Of these, the majority, 70 (82%), were positive, citing enhanced exposure to the medical literature and facilitation of discussion with peers. Fifteen (18%) comments were negative and focused on effective use of time and perceived lack of educational benefit.

Conclusion: Asynchronous online discussion boards may provide additional benefit and learning for clerkships through social learning and learner centeredness where students are distributed in disparate learning environments.

55 A Formal Mentorship Program Improves Quality and Access

Lane DR, Kitaura J/Georgetown University Hospital Washington Hospital Center, Washington, DC; LSU - New Orleans, New Orleans, LA

Background: Faculty mentorship of students entering the annual residency match is essential, yet barriers exist to matching students with high-quality mentors.

Educational Objectives: To create an effective, standardized mentorship program for students entering the residency match in Emergency Medicine (EM), and to evaluate its capacity to eliminate common barriers to excellent mentorship.

Curricular Design: Using data from prior student surveys, faculty discussion groups, and individual student feedback, a framework for mentorship with specific discussion topics and a suggested meeting timetable was created and provided to all participants. Students were formally assigned to one of 10 selected EM faculty. Both mentors and mentees were asked to follow the guidelines of the mentorship program and received consistent encouragement through the 12 month cycle.

Impact: The participating students, as well as GUSOM students applying into all specialties, were surveyed about their mentorship experience at the end of the application cycle

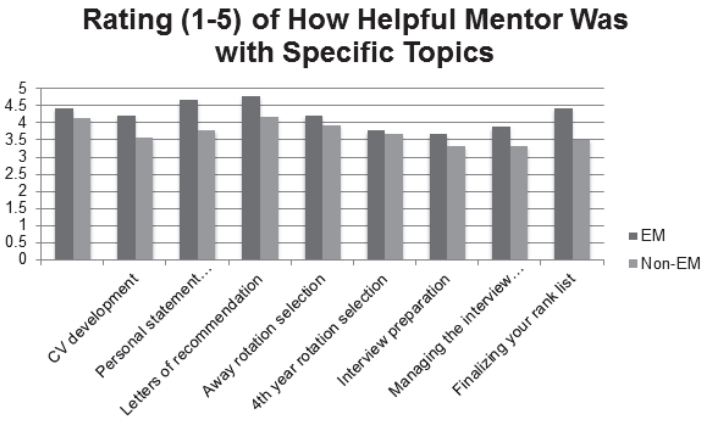

Figure 1. Comparison between EM and non-EM respondents on how helpful their mentor was with particular topics (1=not helpful at all, 5=very helpful).

in March. Ten students in the formal EM mentorship program, and 70 medical students entering other specialties responded to the survey. 18% of non-EM students had difficulty identifying an appropriate mentor, whereas 0% of the students in the mentorship program faced this challenge (p=0.16). Students in the formal mentorship program reported higher rates of satisfaction with assistance they received on specific pertinent components of the residency application process (Fig 1). On a scale of 1-5, all students valued availability (4.9) and residency match knowledge (4.95) in their mentor over faculty reputation (academic 4.1, clinical 4.1 or national 3.5) and research access (3.6). By eliminating access barriers and significant variance, a structured mentorship program for the residency applicant may be an effective tool both in other specialties and at other institutions.

56 Rosh Review as a Predictive Instrument for ABEM ConCert™ Exam Performance

Michael SS, Rosh A, Moskovitz J, Levy PD/Wayne State University/Detroit Receiving Hospital, Detroit, MI; Hofstra North Shore-Long Island Jewish School of Medicine, New Hyde Park, NY

Background: Rosh Review is an online educational platform centered around a bank of board-style multiple choice questions. Prior work in educational psychology demonstrates the effectiveness of practice testing as a study technique and a strong correlation between the number of practice questions answered and standardized exam scores. Passing both the initial qualifying exam and the ConCert exam are required for ongoing board certification in emergency medicine.

Educational Objectives: To increase learners- exposure to realistic practice questions during their preparation for these exams, we made Rosh Review available to physicians preparing for recertification. The objective was to help learners identify their areas of strength and weakness, provide them with targeted education across multiple content areas, and, ultimately, improve their exam performance.

Curricular Design: Progress through the question bank is primarily self-guided, although residency program directors have the ability to assign "mini-tests" to residents pertaining to a particular area of the Model of the Clinical Practice. Leaners may answer questions from specific categories or at random from the entire pool of questions. Most users eventually answer all of the >1000 questions. To aid learners in self-assessment of their preparedness for board examination, we developed a regression model utilizing a standard correction factor to convert Rosh Review results to projected ABEM exam performance.

Effectiveness: Using survey data from 220 examinees who utilized Rosh Review as part of their overall study approach for the 2013 ConCert exam, we demonstrated that Rosh Review's model was 98.8% accurate in predicting that a user would pass their board exam. The mean difference between Rosh Review's predicted score and the user's actual score was 2.5 points (95% CI 1.4-3.6). This suggests that Rosh Review questions are both representative of and meaningful preparation for the ABEM ConCert examination.

57 UNC EM Boot Camp Boosts Confidence Levels of Graduating Medical Students Entering EM Residency Programs

Watson LF, Jones JL/University of North Carolina-Chapel Hill, Chapel Hill, NC

Introduction/Background: Many businesses have used some type of Boot Camp, modeled after military training, to serve as an immersion orientation for new hires. This idea has been incorporated into medical training for interns, primarily in the surgical specialties. In light of the Next Accreditation System and clarified expectations for new medical school graduates- skill level, we saw a need for our students to start EM residency with basic EM specific skills that they may not have gathered from medical school.

In April of 2012 and 2013, graduating UNC medical students who had matched in EM voluntarily enrolled in the UNC Boot Camp program. The students received 2 days of didactic, simulation, and procedural instruction. At the end of EM Boot Camp, medical students completed surveys of their confidence levels with the material reviewed in the courses. The study participants were re-surveyed in August of their intern year.

Educational Objectives: The objective of this educational innovation is to prepare graduating medical students to function more effectively in the ED when they start EM internship. The courses focused on common ED procedures and topics central to EM practice.

Curricular Design: The students attended didactic lectures in the mornings and skills labs and simulation labs in the afternoons. Topics covered in 2013 were modified in response to 2012 surveys (Table 1).

Table 1. EM Boot Camp courses by year.

2012	2013
ED Ultrasound	ED Ultrasound
Pediatric Fever	Interpreting EKGs
Interpreting EKGs	Interpreting Radiographs
Simulation Center: Critical Care	Simulation Center: Critical Care
Antibiotic Selection	Slit Lamp Exams
Splinting	Splinting
Identifying Sick Patients	Identifying Sick Patients
Abdominal Pain in the ED	Geriatric EM
Making the Most of Intern Year	Decision Rules in the ED
EM Jeopardy (Review Questions of EM)	Managing Typical Floor Calls When Off Service

Impact/Effectiveness: Eighteen out of 21 eligible students chose to participate in the survey. Survey responses were almost universally positive. The participants favorably viewed their EM Boot Camp experience and felt that it helped them prepare for intern year. This sentiment remained for most students when they were surveyed after the start of their internship. A small number of students indicated a decrease in confidence in the subject matter after beginning internship. Students gave feedback favoring more simulation lab, procedures, and hands on learning (Table 2).

Table 2. Confidence with Boot Camp topics (on average).

	2012		2013	
Boot Camp Course	At the End of Boot Camp	August of Intern Year	At the End of Boot Camp	August of Intern Year
Interpreting EKGs	3.9	3.7	3.7	3.7
Splinting	3.7	3.5	3.2	3.1
Pediatric Fever	3.7	3.1	3.5	3.6
Identifying Sick Patients	4.0	3.7	3.6	3.9
ED Ultrasounds	3.6	3.3	2.5	2.9
Overall Helpfulness	4.7	4.3	4.9	4.8

58 Development of Proposed Research Curriculum Milestones for Emergency Medicine Trainees

Strout TD, MacVane CZ, Baumann MR/Maine Medical Center, Tufts University School of Medicine, Portland, ME

Background: As graduate medical education transitions from a knowledge-based to a competency-based medical education (CBME) system, the Next Accreditation System of the Accreditation Council for Graduate Medical Education is implementing defined competency endpoints with intermediate milestones as the structure for CBME. While Emergency Medicine has been one of the first specialties to implement the milestones program, current milestones are grounded in the assessment of clinically-oriented competencies.

Educational Objectives: As research education is a core component of the Emergency Medicine residency in this 3-year program, we sought to develop competency-based endpoints and milestones with which to evaluate resident physician progress towards the achievement of curricular goals in evidence-based medicine, quality improvement and research.

Curricular Design: We identified core competencies related to research, evidence-based medicine, and quality improvement that are taught in our research curriculum and used the modified Dreyfus Model of Knowledge Development to develop competency-based endpoints and intermediate milestones with which to assess resident progress through the curriculum.

Impact/Effectiveness: Initial efforts have resulted in the development of 14 competency-based goals and their related educational objectives as well as a series of milestone descriptors designed to evaluate the progress of resident physicians thorough our research curriculum. A pilot study to evaluate the utility and validity of the research curriculum milestones is underway. The current iteration of the research curriculum milestones could be adapted to any training program with similar objectives.

59 Instituting a Flipped Classroom Design into an Emergency Medicine Residency Conference

House H, Van Heukelom J/University of Iowa, Iowa City, IA

Background: The "Flipped Classroom" design has been implemented extensively at the high school and college levels, but its use in Graduate Medical Education (GME) is limited. We instituted a flipped classroom design for an Emergency Medicine (EM) Residency conference.

Educational Objectives: The objective of this intervention was to increase the satisfaction, participation, and effectiveness of required residency conference time within an EM residency

Curricular Design: Prior to September 2013, the EM conference consisted mostly of didactic lectures with occasional simulation. In September, residents were given required reading or listening assignments prior to conference days. The conference began with a quiz, followed by small group discussions or projects. One hour each day was reserved for a grand rounds lecture. The residents were also taken aside throughout the month for solo simulations. Evaluations were collected weekly followed by a comprehensive survey at the end of the month.

Impact/ Effectiveness: Overall, the residents rated the curriculum a 5.9/10. The residents found the pre-assignments, quiz, and small group sessions helpful. The solo simulations were the highest rated experience of the month. Respondents did not agree that limiting "traditional" lecture is an improvement. Residents were asked if the conference "increased their knowledge" of a subject, was found to be "interesting and engaging", and if they intend to change their practice based on content from the conference. On all of these measures the "flipped" design performed significantly worse than the "traditional" model. The flipped classroom can be effective in GME, but it requires a significant culture change for adoption. The greatest challenges we faced in creating this curriculum was getting the faculty to avoid giving a traditional lecture and finding material to use for the pre-assignments.

60 Using Simulation to Assess Clinical Skills in the Emergence Medicine Clerkship

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Introduction: Shift evaluations and multiple choice question (MCQ) exams are frequently used to assess students. Evidence of their reliability and validity as evaluations of clinical skill is weak. Forms of clinical skill assessment include oral boards-style cases and OSCEs. Simulation assessments using global scales and checklists can reliably evaluate learner behavior and skills.

Educational Objectives: To develop an assessment tool to more accurately evaluate medical students' clinical skills during the required EM clerkship.

Curricular Design: We developed a dual-format assessment tool including a yes/no checklist and a global rating scale (GRS) of the student's approach to a simulated patient. The checklist was developed from Level 1 EM Milestones behaviors that the authors deemed most appropriate for assessment by simulation. In addition, some L2 behaviors were included to allow for identification of high performers. The GRS was developed using a Likert scale to assess performance in the areas of information gathering, physical exam, diagnostic testing, patient assessment, patient management and pharmacology. Students each performed the same 3 standardized simulation cases: altered mental status, chest pain, and shortness of breath.

The tool underwent modification after initial use on 10 students. Checklist items were changed from unacceptable/ good/excellent to yes/no/NA scoring, items not easily evaluated during simulation were removed, and the GRS Pharmacology section was added. Some GRS anchors were modified to better define expectations based on EM Milestones (Figure 1).

Impact/Effectiveness: MCQ exams and shift evaluations do not completely evaluate students- clinical skills. We have developed an assessment tool for clinical performance on standardized simulation cases in the EM clerkship. Future efforts will determine inter-rater reliability of the assessment tool and compare performance to shift evaluations and standardized written examination scores.

61 Interprofessional Education on Emergency Medicine Elective Rotations

Jones D, Delorio N/Oregon Health & Science University, Portland, OR

Introduction: By virtue of their position in the medical system, physicians are often in leadership roles interacting with patient care disciplines. Traditional medical education offers little exposure to the roles and responsibilities of non-physician members of the care team. Multi-disciplinary exposure is gradually expanding, but there is uncertainty about how best to expose medical students to the other members of the medical system.

Educational Objectives:

- Observe providers of multiple EM-affiliated disciplines
- Describe how a poison control center operates
- Recognize the ED nursing scope of practice
- Participate on an EMS shift
- Describe the ED triage process

Curricular Design: During the 4th year EM elective rotation, students engage in four activities working with non-physician members of the medical team.

Action/Objective	Yes	Notes	Milestone
Recognizes abnormal vital signs			PC1 (L1)
Performs a primary assessment on a potenially critcally ill or injured patient			PC1 (L2)
Perform a reliable, comprehensive history and physical exam			PC2 (L1)
Perform a focused history and physical exam which reliably addresses the chief complain and urgent patient issues			PC2 (L2)
Determines necessity and urgency of diagnostic studies			PC3 (L1)
Prioritizes essential testing			PC3 (L2)
Orders appropriate diagnostic studies using decision rules as appropriate			PC3 (L2)
Asks for drug allergies			PC5 (L1)
Recognizes when a therapeutic intervention is indicated as part of a pa;ent management plan			PC6 (L1)
Constructs a list of potential diagnoses based on chief complaint and initial assessment			PC4 (L1)
Constructs a list of poten;al diagnoses based on the greatest likelihood of occurrence			PC4 (L2)
Constructs a list of potential diagnoses with the greatest poten;al for morbidity and mortality			PC4 (L2)
Establishes rapport with patients			ICS1 (L1)
Listens effectively to patients			ICS1 (L1)
Elicits patients reasons for seeking health care			ICS2 (L2)
Communicates pertinent information to colleagues			ICS2 (L2)

Information Gathering	History inefficient and unfocused (comprehensive)	History focused but incomplete, disorganized, lack of history impacted patient care	All pertinent info gathered only with prompting	History focused, included pertinent +/-, performed at a medically appropriate time
	1	2	3	4
Physical Exam	Did not appear to perform a primary survey	Performed primary survey; recognized abn vitals; survey lacked focus or was incomplete	Recognized abn vitals, performed adequate primary *and* secondary surveys	Synthesized vitals and primary/ secondary surveys to accurately ID patient's most likely underlying diagnosis
	1	2	3	4
Diagnostic Testing	Ordered too many or too few initial diagnostic tests; no focused to testing	Ordered most of the appropriate tests, appeared to be working toward a diagnosis	Prioritized essential testing with prompting	Prioritized essential testing, recognized and acted upon abnormal results
	1	2	3	4
Patient Assessment	Did not accurately recognize patient acuity or changes in condition	Recognized acuity but did not respond to changes in condition	Responded to some cues from the patient's condition, history, physical, or diagnostic tests	Responded appropriately to history, physical, diagnostic cues or changes in condition
	1	2	3	4
Patient Management	Did not attempt a therapeutic plan	Recognized when therapeutic condition was indicated	Responded to patient condition, attempted management	Responded to patient condition and reassessed after therapeutic intervention
	1	2	3	4
Pharmacology	Dangerous treatments	Incorrect but not dangerous	Mostly correct for chosen condtion, other options better	Appropriate treatment for patient diagnosis
	1	2	3	4
Average				

Figure 1.

1. 12 hours on a paramedic staffed ALS ambulance
2. 5 hours in the poison control center, participating in toxicology consult calls and toxicology rounds
3. 4 hours in the emergency department triage center observing the triage nurse
4. 4 hours with an emergency medicine nurse. A "bingo" card indicates tasks they should try to perform (e.g., Foley placement, etc)

Recognizing each shift is subject to the variability of patient volume and acuity, supplemental readings were provided.

Impact: In the OHSU health care training system there has been a recent prioritization of interprofessional education. The EM rotation has been at the forefront of how exposure to other team members can effectively occur. Student satisfaction is high for these experiences (3.9/5 for the poison center, 4.3/5 for the EMS shift). Representative comments include "great experience I would not otherwise have had," "piqued interest in tox," "would have liked more time with the nursing shift." We believe this microcurriculum in our rotation could be easily assimilated into any school's existing EM rotation where increased exposure in interprofessional teams is desired.

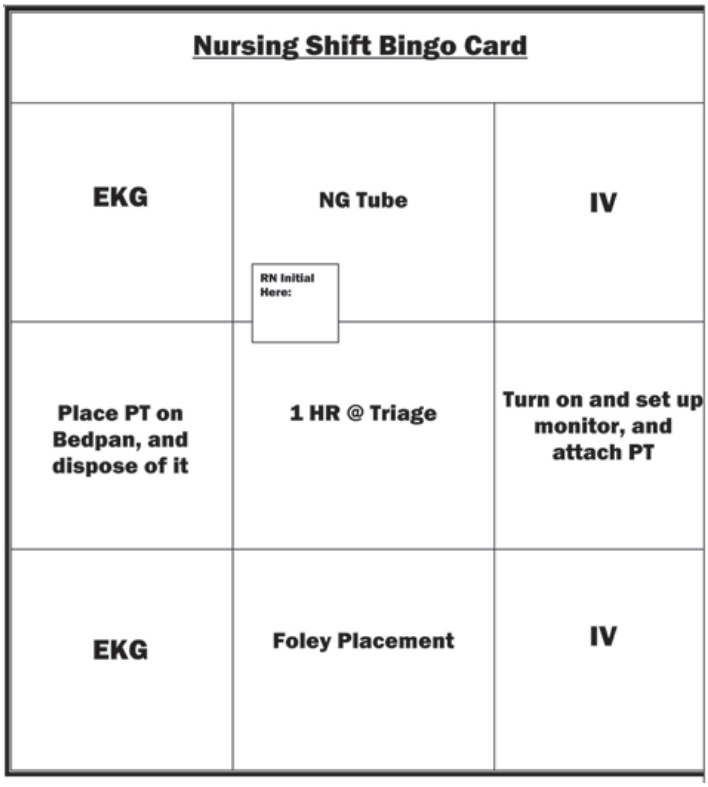

Figure 1. Nursing shift bingo card.

62 Interactive Live-streaming: A Novel Twist to the Traditional Educational Conference

Jhun P, Shoenberger J, Swadron S, Bright A, Herbert M/ University of Southern California, Los Angeles, CA

Introduction: The weekly educational conference is the centerpiece of many Emergency Medicine residency programs. Unfortunately, resident physicians may be unable to attend conference or educational activities due to duty hours, off-service rotations, etc. Additionally, scheduling faculty lecturers for pre-determined conference dates is often difficult, particularly for out-of-town guest faculty.

Educational Objectives: We sought to increase lecturer and resident participation in our educational conference by live-streaming it for online viewing, providing a faculty-moderated chat forum, streaming pre-recorded faculty lectures with online faculty available for discussion, and recording and archiving the conference for later viewing for asynchronous learning purposes.

Curricular Design: Although we utilized a professional recording studio, a simple setup involving a camcorder, microphone, and livestreaming software, such as Wirecast 5.0, will suffice. An online livestream and chat forum, such as livestream.com, provided the software platform through which residents and faculty participated in the online forum. The residency program director moderated the forum to help facilitate both online and live discussion. One faculty lecturer, who was out-of-town for that conference date, pre-recorded his lecture and was available online that day for discussion. All live-streaming was recorded, edited and immediately made available online.

Impact: A survey of online residents and faculty participants was positive. Of 23 residents who were unable to attend conference due to vacation, off-service, or duty hours, 8 (35%) participated online. Seven faculty members and one guest faculty member participated online as well. All found this resource useful and wanted to make this option available on a regular basis. Live-streaming, combined with moderated online forum discussion, increased resident and faculty participation and may be a useful adjunct to educational conferences.

63 The Milestones Dashboard – A Novel Tool for Resident Evaluation and Amalgamation of Milestones

Bhat R, Graham A, Davis J, Maloy K/Georgetown University Hospital Washington Hospital Center, Washington, DC

Introduction/Background: The recent introduction of the American College of Graduate Medical Education (ACGME) milestones and clinical competency committees (CCC) has produced a significantly increased workload for Emergency Medicine residency programs. This increased workload includes tracking additional metrics, as well as the need for amalgamating these metrics to facilitate an efficient consensus decision regarding each resident's performance.

Educational Objectives: Our goal was to develop an

online evaluation tool to track each resident's performance for the ACGME milestones as well as an efficient data amalgamation tool to track all evaluations and allow CCC members access for an efficient and accurate discussion of each resident's progress.

Curricular Design: We developed an online tool called "Milestones Dashboard" that allows faculty to fill out evaluations, including but not limited to ED monthly performance, simulation evaluation, standard direct observation, procedural competency, and customized forms. These evaluations and their supporting data feed directly into the dashboard view (Figure 1) and each resident's performance for the last 6 months can be tracked and evaluated using the CCC view (Figure 2). The data from the CCC view can then be exported into an excel file for entry into the ACGME website for reporting.

Impact/Effectiveness: This evaluation and tracking tool has allowed our program to develop a streamlined, integrated system for evaluation entry, resident data analysis as well as data reporting for the ACGME.

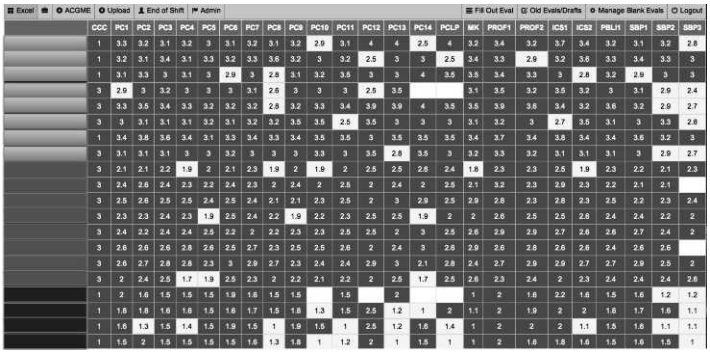

Figure 1. Dashboard view showing resident names (redacted for privacy) by class in first column, with horizontal axis with each milestone. Green/yellow color-coding for milestones is based on program leadership consensus with green showing at/above level of training and yellow showing areas of concern.

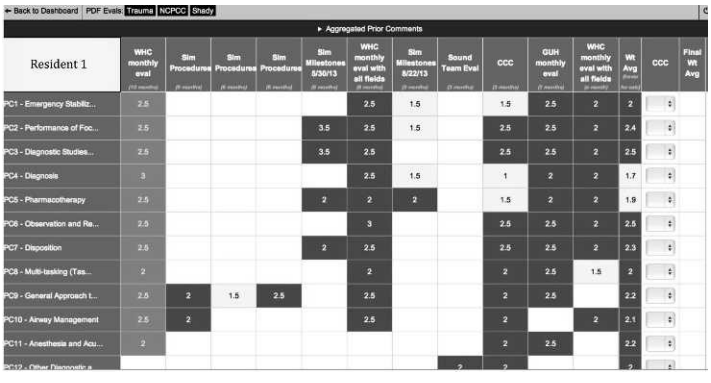

Figure 2. Clinical Competency Committee (CCC) view showing all recent evaluations in horizontal axis with milestones in vertical axis. Prior evaluations submitted by pdf file are shown as hyperlinks highlighted in black.

64 A Team-based Learning Curricular Framework as an Effective Vehicle for Milestone-based Evaluations

Moadel T, Johnson S/SUNY Stony Brook University Medical Center, Stony Brook, NY

Introduction: With the institution of the Emergency Medicine (EM) Milestones paradigm for EM resident assessment and development, there is a increasing need for effective and engaging educational programming that can easily incorporate milestones assessments.

Objectives: To create an effective Team-Based Learning (TBL) framework for the EM resident didactic curriculum that can be implemented to easily evaluate all 23 EM Milestones.

Curricular Design: Framework implemented during resident educational conference:

I. Residents complete an Individual Readiness Assurance Test (iRAT) based on assigned pre-reading. Then, working in pre-assigned teams, they complete a Team Readiness Assurance Test (tRAT), which is scored using an Immediate Feedback Assessment Technique (IF-AT) scoring card, which identifies the correct answer when chosen.

II. Students then engage in team-based application exercises, which are designed to apply knowledge from the pre-reading, including: (1) simulations; (2) oral-board style case-based vignettes; (3) team research/teaching activity. For the research/teaching activity, teams are provided with an interesting or controversial clinical case, and they use information technology to research evidence-based medicine resources to help guide management. Each team communicates their findings to the class. A faculty member precepting each group will have pre-printed checklists for each of the three application exercises with the appropriate milestones listed.

Impact: This TBL curricular framework takes advantage of the interactive learning environment as an opportunity to evaluate residents on all twenty-three milestones. Residents' scores on the iRAT/tRAT evaluate the Medical Knowledge milestone. The residents' performance on the three application exercises encompass the remaining Patient Care, Professionalism, Interpersonal Communications Skills, Problem-Based Performance Improvement and Systems-Based Practice based milestones.

TBL Activity	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9	PC10	PC11	PC12	PC13	PC14	MK	PROF1	PROF2	ICS1	ICS2	PBLI	SBP1	SBP2	SBP3
Simulation	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X	
Case-based vignette		X	X	X			X																
Team research/ teaching activity					X				X	X	X	X		X		X					X	X		X
Readiness Assurance Test															X								

Figure 1. Curriculum framework covers milestones.

65 Intern De-escalation Training

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Introduction/Background: Emergency Department (ED) visits for patients presenting with agitation and mental health issues are common and increasing. Caring for the agitated patient offers many challenges in keeping the patient and staff safe while trying to obtain a meaningful history and exam in order to perform a medical screening exam. Missing or misdiagnosing a medical etiology of agitation can be life threatening. De-escalation training which helps facilitate the medical screening exam is not commonly taught in medical school.

Educational Objectives: Objectives of the Intern SIM de-escalation training included demonstrating:

- Safety in approaching and interviewing an agitated patient
- Effective verbal de-escalation technique(s)
- Appropriate pharmacologic interventions
- Understanding of and proper application of the psychiatric hold

Curricular Design: De-escalation training occurred during the first month of internship. Prior to the training, participants received articles on de-escalation techniques and pharmacologic choices for the agitated patient. A live actor played the role of an agitated psychiatric patient at the ED SIM center. Just prior to entering the SIM room, Interns reviewed the patient's triage note then entered the agitated patient's room. Focus was placed on safely interacting with the patient, use of verbal de-escalation techniques, appropriate pharmacologic interventions and correctly placing a psychiatric hold. After the scenario, the intern was debriefed by a Faculty observer.

Impact/Effectiveness: Evaluations of the training identified the case to be challenging and new content to many. The use of a live actor enhanced the realism of the experience and offered the chance to practice de-escalation techniques while in the safety of the SIM environment. Participants stated they were appreciative of a chance to make their "rookie" mistakes in SIM rather than doing so in the ED where they may have put the patient or themselves at risk.

Figure 1. De-escalation training session.

66 A Council of Residency Directors – Emergency Medicine (CORD-EM) Taskforce Report on Remediation of Interpersonal and Communication Skills and Professionalism EM Milestones

Sullivan C, Nazario S, Shah SH, Visconti A, Lu M, Hexom B, Regan L, Pazderka P/Truman Medical Center/ University of Missouri-Kansas City School of Medicine, Kansas City, MO; Florida Hospital East Orlando, Orlando, FL; University of Massachusetts Medical School, Worcester, MA; New York Methodist, New York, NY; University of Maryland, Baltimore, MD; Mt. Sinai, New York, NY; Johns Hopkins School of Medicine, Baltimore, MD; Western Michigan University School of Medicine, Kalamazoo, MI

Introduction: The Accreditation Council for Graduate Medical Education implemented EM Milestone expectations for residents in training beginning July, 2013. Professionalism milestones include professional values and accountability, and interpersonal and communication skills (ICS) incorporate patient centered communication and team management skills. While there are suggested evaluation methods for each milestone, to date there are none specific to remediation of the milestones for residents that fail to meet performance expectations.

Educational Objectives: A CORD-EM professionalism and ICS remediation taskforce was put into service and reports the development of specific activities and tools to assist programs with remediation of residents regarding each milestone level specific to professionalism and ICS.

Curricular Design: The milestone remediation taskforce divided the four professionalism and ICS milestones among members. Each member completed a literature review regarding methods to remediate each performance expectation for the specific milestone. In conjunction with on-going experience of members with resident remediation of professionalism and ICS, specific methods to address sub-standard performance for each milestone level were developed. Monitoring schedules and expectations for performance were outlined. Results were compiled and a consensus of members was reached.

Impact/Effectiveness: Residency programs often struggle with effective remediation of their residents who fail to meet expectations, especially with professionalism and ICS. With specific remediation activities and monitoring methods described, EM training programs will be able to use the recommendations as a guide to remediate professional values, accountability, patient centered communication and team management skills.

67 Improving Emergency Department Documentation and Subsequent Billing by Rotating Residents through a Brief Online Teaching Module

Habboushe J, Hasan S, Caces PA, Liggatt A, Dulani T/ Beth Israel Medical Center, New York, NY; Maimonides, Brooklyn, NY

Background: We made improvements to documentation in our emergency department (ED) with long term projects, but this approach cannot work with rotators - residents of other specialties who work in our department for 2-4 weeks. In their brief time in the ED, rotators learn new clinical skills, a new environment, and a new computer system. Thus, an already overwhelmed trainee has limited time to learn ED-specific documentation.

Objective: A brief, self-administered online teaching module and quiz can increase documentation quality of ED rotators, leading to improvements in coding and billing.

Methods: A retrospective study was performed at a high-volume urban academic tertiary care center. Before rotating in the ED, rotators received an e-mail with a brief PDF review of basic ED documentation and a link to a mandatory online 10-question quiz.

The intervention was implemented in December 2011. Data was obtained from the coding department for August 2011 and March 2012. The average relative value units (RVU) per patient of rotators- charts were compared before and after intervention.

A follow up study measured rotators- retention of proper documentation by having them complete the same quiz at least six months after their rotation.

Results: For rotators' charts, the average RVU per patient was 3.06 pre-implementation and 3.23 post-implementation - an absolute increase of 0.17 RVU per patient (5.43% relative increase). Figure 1 compares the distribution of chart levels pre- and post-intervention. Assuming $35 per RVU reimbursement (Medicare average), we estimate an annual revenue increase of $47,285 based on our patient volume. Figure 2 reveals good retention of information with over 50% of questions answered correctly.

Conclusion: A brief online teaching module and quiz is effective at improving rotating resident documentation and increasing billing from rotator charts by more than 5% on average for a total potential increase in collections of close to $50,000.

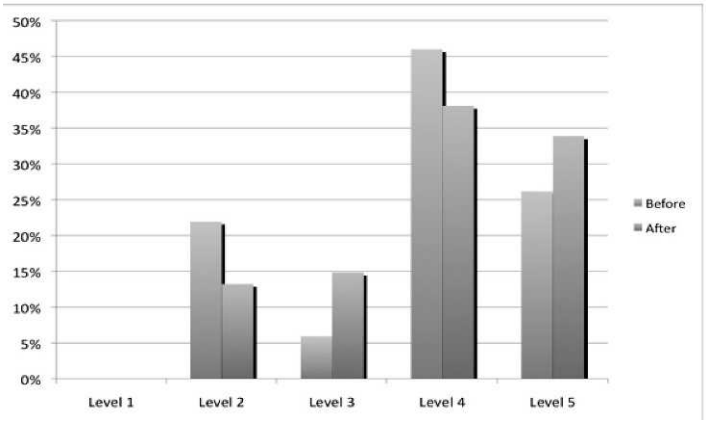


Figure 1. Distribution of chart levels pre- and post-intervention.

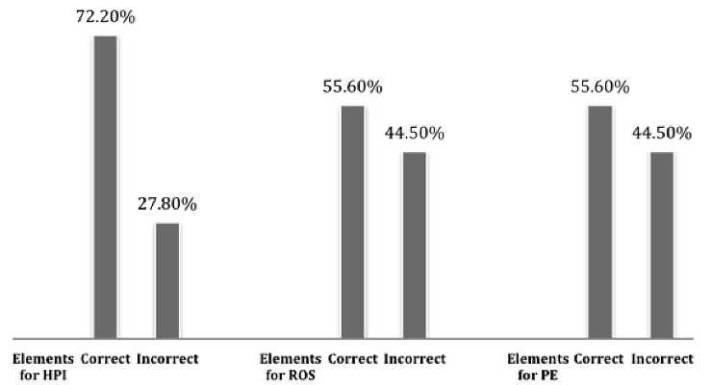


Figure 2. Improved retention with >50% of questions answered correctly.

68 Airway Relay Race

Wagner J, Julianne D, Daniel T/Washington University School of Medicine, St. Louis, MO

Safe, competent, and expedient airway management is a vital skill in EM. Simulation is now a key way this skill is taught, but keeping the learner engaged is a frequent hurdle when performing the repetitive deliberative practice necessary to achieve mastery. Yet this practice is crucial to skills acquisition prior to their use in the high-stakes environment of the ED. The creation of an "Airway Relay" competition offers a way to increase the engagement of learners by exploiting the competitive nature inherent in most EM physicians.

The setup consists of 5 TruCorps variable anatomy intubation heads, a Laerdal SimMan 3G, six iPads (flip cards may substitute), as well as a variety of airway devices available in our ED. The intervention took place at a four-year academic residency program utilizing 48 residents as our learners. Each resident belongs to a "Family" that competes on a recurring basis in team-based educational activities. We divided the residents into their families resulting in approximately six residents on a team. At the base of each intubating head is an iPad displaying a case scenario and images or videos supporting the case. The rules of engagement allow each team to intubate one mannequin at a time. The team with the shortest total time wins.

Conceived of as a fun race the relay turned into a great learning activity for all involved. Instead of just diving straight in and breaking teeth to obtain the quickest tubes the residents used care and precision in choosing devices and performing the intubations. A post-session survey showed that the vast majority found the day useful, worthwhile, and engaging.

Future directions include use with attending faculty and

incorporating more procedures. Limitations include but are not limited to determining the winner strictly by time as technique is at least as important. There also exist the limitations posed by number and type of mannequins available. Despite these limitations the activity was very positive.

69 Curricular Design to Engage Residents in Institutional Quality/Safety Initiatives

Bork S, Ditkoff JS/Oakland University William Beaumont School of Medicine, Royal Oak, MI

Introduction/Background: A component of the ACGME and ABEM Milestone Project requires assessment of resident knowledge and activity regarding patient safety (SBP1). Specifically, level 4 achievement suggests participation in an institutional process improvement plan.

Educational Objective: Increase resident exposure to institutional quality and safety department and gain an understanding of the process by participating in a quality improvement project.

Curricular Design: Residents had a two-part lecture presentation given by the hospital's Quality and Safety Department (QSD). The first part was a one-hour presentation which introduced the residents to the goals of the department,the measurement of quality (specifically ED metrics), and the method of reporting and addressing patient quality and patient safety improvement (PSQI). At the end, residents were given a simple assignment of completing an online PSQI from their work environment. The second hour, given 1 month later, reviewed examples of the resident-submitted PSQIs and outcomes of their PSQI investigations were presented. Third year residents were then asked to choose a QI project based on the submissions or to participate in a Kaizen event in the ED. Assessment of the method is via feedback from all participants including the members of the QSD and the residents themselves. The Clinical Competence Committee will then also provide feedback to the residents. Resources needed include an interested person in the institution's quality and safety department to give the lecture presentation, and also willing physicians/persons in ED to work with the residents on their QI projects. Initial difficulties included overcoming resident reluctance to report adverse events via the PSQI system due to an ingrained reluctance to actually report in writing.

Impact: Patient quality and safety is becoming ever more important at every institution and early engagement during residency is a necessary component of education.

70 An Innovative Approach to Quality Improvement and Patient Safety: A Resident-initiated and Administered Quality Improvement Committee

Adler N, Chipman A, Page Wills C, Hern HG/Alameda County Medical Center - Highland Hospital, Oakland, CA

Introduction: Knowledge of patient safety and quality improvement (QI) is fundamental to graduate medical education. With the ACGME's implementation of the NAS there is a requirement for resident involvement in harm reduction and QI.

Educational Objectives: We developed a QI curriculum centered on a novel resident-run quality review committee. The goals were to increase interest and participation in QI, improve knowledge of QI principals, and develop skills for performing a root cause analysis (RCA).

Curricular Design: This is a unique project, in that it is resident-initiated and administered. Using the six-step Kern process, we developed an interactive QI curriculum. Resident focus groups were conducted to identify knowledge gaps. EM faculty met with residents over a year to create educational goals. A systematic literature review was performed and a core curriculum and reader were developed. The cornerstone of this curriculum is a resident-run QI committee. The group consists of twelve residents, from various years, who have received didactic instruction in QI principals. The group meets monthly to perform RCAs on selected cases. The findings are disseminated to the residency via quarterly reports. When areas of knowledge gaps are identified, they are discussed with faculty and the topics are integrated into the residency curriculum. When systems errors are identified they are brought to faculty or staff involved and a strategy is devised to improve care. Finally, a list of projects is continually updated and used in departmental longitudinal QI projects.

Impact/Effectiveness: For the core group of residents on the committee there is significant instruction in QI and an opportunity to perform RCAs on a monthly basis. The dissemination of the findings allows for broader education of QI practices and open discussion of medical error. The project has resulted in improved patient care and empowers residents to report and discuss error as a mechanism for change.

71 Proposed Emergency Medicine Ultrasound Fellowship Milestones

Leech S, Davison J, Huang R, Lewis R, Adhikari S, Nomura J/Orlando Regional Medical Center, Orlando, FL; St. Luke's Roosevelt Hospital, New York, NY; University of Arizona Medical Center, Tucson, AZ; Christiana Care, Newark, DE

Introduction/Background: Ultrasound (US) is a skill integral to the practice of emergency medicine (EM). Emergency US fellowship programs train future leaders and develop the necessary skills to successfully lead an US program. Currently, no standardized evaluation tool exists for US fellows, and there is wide variability among programs.

Educational Objectives: We propose a milestone-based system to assess fellow competencies. We describe a graduated approach for the key knowledge, skills, abilities, attitudes, and experiences for US fellows.

Milestone 1

Clinical Ultrasonography

Develops clinical competency in ultrasound image acquisition, interpretation, and integration in the care of emergency patients for the the full range of point-of-care US applications

Level 1	Level 2	Level 3	Level 4	Level 5
Graduates from ACGME or AOA accredited EM residency Exceeds > 150 core US (level 4 EM milestone PC12) Meets 2008 ACEP Emergency US guidelines for ultrasound credentialing Understands basic US physics	Learns advanced ultrasound physics, including Doppler Expands US skills to include advanced applications as delineated in the CORD-AEUS consensus document	Optimizes US images in all circumstances, including technically challenging patients Understands pitfalls/ limitations of US and alternative diagnostic and treatment strategies Correctly interprets and integrates US findings into patient care in a wide range of clinical scenarios	Performs a minimum of 1000 US in both core and advanced US applications Meets graduation criteria from 2010 ACEP Emergency Ultrasound Fellowship Guidelines information paper	Develops new point-of-care US applications Develops US protocols for ED and other departments across an institution Develops US guidelines for national organizations

Suggested Evaluation Methods: Direct observation in clinical practice, Quality assurance review, Simulation, OSCE, SDOT, written examination, US case log
Competencies evaluated: PC, MK, PBLI, ICS, Prof, SBP

Milestone 2

Education and Teaching

Develops educational skills to effectively teach and transfer knowledge to leaners

Level 1	Level 2	Level 3	Level 4	Level 5
Understands different learning styles and differences important to adult learners Identifies learner's needs through structured evaluation	Employs effective teaching strategies Develops US educational materials, such as lectures, handouts, books, blogs, videos, websites Helps run hands-on labs and small group sessions Improves bedside teaching and presentation skills Participates in an US educational rotation for residents	Matches appropriate educational strategies with learner's needs Uses alternative strategies to traditional didactics, such as social media and web-based resources Participates in competency evaluation of learners, including OSCEs and SDOTs Coordinates US educational activities for medical students, residents, and attending physicians	Completes fellowship educational project Gives at least 4 lectures on core and advanced US topics Independently runs hands-on labs for core and advanced US topics	Develops educational curriculum for training medical students, residents, fellows, and attending physicians Coordinates US training across departments of an institution Participates in the development of educational guidelines for national organizations

Suggested Evaluation Methods: Direct observation in teaching, Review of educational materials, Review of US teaching portfolio, Written exam, Observation and evaluation of learners
Competencies evaluated: PC, MK, PBLI, ICS, Prof, SBP

Milestone 3

Administrative Leadership

Develops administrative leadership skills in order to independently run an US program

Level 1	Level 2	Level 3	Level 4	Level 5
Understands role of quality assurance (QA) and improvement (QI) in running an US program	Participates in ongoing QA of submitted US studies Involved in credentialing of new US users during the training process Stocks necessary US supplies (gel, transducer covers)	Coordinates image archival and storage Maintains US equipment and handles necessary service calls Participates in interdepartmental meetings regarding point-of-care US Involved in US billing, report generation, and billing audits Generates and provides feedback of reviewed QA studies	Completes fellowship administrative or QI project Coordinates QA/QI program for ED US program Participate in EUS financial program (budget and proposals for equipment purchase)	Coordinates QA/QI across departments of an institution Develops QA/QI and accreditation guidelines for national organizations

Suggested Evaluation Methods: Direct observation, Review of QA/QI studies performed, Review of feedback, Tracking revenue from billed studies
Competencies evaluated: PBLI, ICS, Prof, SBP

Milestone 4

Research and Scientific Discovery

Develops research and scientific discovery skills to forward the scientific basis of point-of-care US

Level 1	Level 2	Level 3	Level 4	Level 5
Becomes familiar with current US literature	Develops and formulates fellowship research question and project Prepares and submits fellowship project to IRB Participates in ongoing US research projects Participates in journal club and literature reviews	Collects and analyzes data for fellowship research project Presents research findings at a regional or national conference Critically appraises scientific literature regarding point-of-care US and develops best evidence practices	Completes fellowship research project Submits and publishes completed research manuscript	Obtains funding for research projects Coordinates multi-center US research projects Serves as a peer reviewer Serves as an editor for scientific journal Participates in advanced research training courses

Suggested Evaluation Methods: Direct observation, Mentoring, Review of research project, Journal club
Competencies evaluated: PC, MK, PBLI, ICS, Prof, SBP

Milestone 5

Advocacy

Participates in advocacy to promote point-of-care US in institution and through national organizations

Level 1	Level 2	Level 3	Level 4	Level 5
Becomes familiar with history and future directions of point-of-care US Understands scope of practice of point-of-care US	Understands issues and politics regarding point-of-care US	Participates in departmental committees in institution regarding US	Participates in interdepartmental committees in institution regarding US Involved in promotion of point-of-care US within institution	Chairs US section or department within an institution Actively participates in a national organization US committee Participates in developing US policies by national organizations

Suggested Evaluation Methods: Direct observation, Review of activities, Departmental meeting minutes
Competencies evaluated: PC, MK, PBLI, ICS, Prof, SBP

Figure 1. Proposed emergency medicine ultrasound fellowship milestones.

Curricular Objectives: The milestones include Clinical Ultrasonography, Education and Teaching, Administrative Leadership, Research and Scientific Discovery, and Advocacy (Image 1). The milestones and individual components were developed using published ACEP US fellowship guidelines and expert consensus opinion. The milestones utilize the same 5 level approach as the ACGME-ABEM EM Milestones. Level 1 represents expectations of an incoming fellow, Levels 2 and 3 represent progression through fellowship training, Level 4 corresponds with a graduating fellow, and Level 5 is that of an advanced practitioner. No specific resources are required for implementation, and milestones can be incorporated into monthly and quarterly fellow evaluations. The milestones also offer a structured longitudinal support to the fellowship curriculum.

Impact/Effectiveness: Milestones would allow a standardized approach, ensure quality training across programs, and reduce variability. Fellows would receive well rounded training and gain experience essential to becoming an effective leader. We plan to study and validate these milestones.

72 Starting From Scratch: Development of an Emergency Medicine Administrative Residency Track at an Academic Medical Center

Redwood R, Sharp B, Pothoff J, Hamedani A, Rodriguez N/University of Wisconsin Madison, Madison, WI

Background: Scholarly tracks have been increasingly implemented to help residents identify a career-focus or academic niche. Early adopters have received praise from their graduating residents. At the University of Wisconsin School of Medicine and Public Health, we developed a Healthcare Administrative Scholars Program (HASP) to adequately train our residents for administrative roles within community or academic centers.

Educational Objective:

- Teach the basics of healthcare administration including quality management, operations management, healthcare economics, healthcare law, and healthcare information systems
- Expose residents to administrative careers
- Develop an administrative project portfolio

Curriculur Design: Whereas many programs or tracks consist of larger groups with primarily didactic content, our program is mirrored after an administrative fellowship, with recruitment limited to one administrative scholar per class in order to optimize residents' access to mentorship and high-level meetings. The HASP two-year curriculum spans the EM2 and EM3 years and consists of departmental and hospital-wide meetings, required readings, successful completion of a quality improvement project, and paid

attendance to a national meeting. Administrative scholars are chosen based on interest and academic record. Year one has an emphasis on operations, IT and coding. Year two has an emphasis on quality, safety, law and health policy.

Impact: Initial six-month review from the first administrative scholar reflects an overwhelmingly positive experience. We plan to collect and publish career-outcome data at the five and ten year mark.

References:

1)Regan L, et al. Scholarly tracks in emergency medicine. *Acad Emerg Med*. 2010;17 Suppl 2:S87-94.

73 Implementation of a Longitudinal Educational Elective in an Undergraduate Wilderness Emergency Medicine Curriculum

Rockwood J, Mavromaras M, McNeil C/University of Texas Health Science Center-San Antonio, San Antonio, TX

Introduction: Teaching and mentorship become a large part of a physician's career. Learning how to become an educator is an invaluable skill for growing physicians. While there are many opportunities for learning this skill in graduate medical education, few exist at the undergraduate level. We developed a longitudinal, mentorship-based curriculum where medical students participate in a Wilderness Medicine teaching elective.

Objectives: Develop a longitudinal curriculum shaped by the participating student's level of education and experience. We expect students to participate in the educational activity. Next students learn how to become educators and finally they learn how to manage their own curriculum.

Design: Our elective begins by teaching austere medicine skills to MS2s who are introduced to Wilderness Medicine through lectures, reading material, procedural workshops and field exercises. The course includes a three-day backcountry experience where students manage patient-based simulated cases in an austere setting. MS3s move into the educator role by teaching procedural skills to MS2s in the austere setting. Additionally, MS3s design a patient-based scenario, act as the moderator and highlight important teaching points in the post-case discussion. MS4s graduate to an administrative role in curricular development. MS4s work with faculty to design the course by selecting educational material, scheduling lectures, workshops, and field exercises and coordinating logistical aspects of the 3-day backcountry experience. MS4s also provide peer oversight to MS3s engaged in the teaching role.

Impact: There has been an overwhelmingly positive response to this pilot program at our institution. Our curriculum can be applied to other Emergency Medicine specialties including Ultrasound, Global Health and Disaster Medicine. Medical educators should seek to provide opportunities for undergraduate medical students to learn the role and assume responsibilities of education.

74 Multi-modal Curriculum to Teach Rare, Life-threatening Obstetrical Emergencies

Nobay F, Thornberg L, Bonham A, Duecy E, Dadiz R, Arnold C, Spillane L/University of Rochester, Rochester, NY

Introduction: EM residency experiences in high-risk Obstetrical situations are limited. The majority of our residents have never participated in a live, high-risk delivery. A focused curriculum using multi-modal learning strategies was developed to address these deficiencies.

Educational Objectives: To identify high-risk OB situations pertinent to the practice of EM and to develop a sustainable curriculum to teach cognitive and technical skills related to these rare situations.

Curriculum Design: Post-partum hemorrhage, shoulder dystocia, newborn resuscitations and compound presentations were identified as high-risk situations. Relevant milestones were mapped to the curriculum. Instructional materials (lectures, video-podcasts and scripted simulated cases) and assessment tools (skills checklists and an MCQ test) were created. Residents attended traditional lectures and viewed videos in the month prior to the 5-hour workshop. The value of this experience was evaluated.

Impact: Residents participated in the longitudinal experience. Residents demonstrated competency in identification and management of high-risk conditions and the technical skills required to manage these conditions. Average MCQ scores rose 18% with less than expected improvement due to the pharmacology section alone. Residents uniformly valued this process and felt it should be an annual opportunity.

Conclusion: High-risk OB deliveries are a rare; competency in this area is critical requiring a multi-faceted learning strategy. A deficiency in knowledge of post partum hemorrhage pharmacotherapy was significant and not well addressed in this longitudinal experience. Future emphasis on the importance of resource utilization during critical events should be added. These educational materials and simulation cases are easily reproducible and modifiable for future use. We suggest this model of collaborative multi-faceted, education strategy to teach other rare cross-disciplinary high-risk events.

75 Consultations and Transitions of Care Education: An Interdisciplinary Workshop

Roche CN, Marko K/The George Washington University School of Medicine and Health Sciences, Alexandria, VA

Introduction: Specialty consultations and admissions are necessary in the practice of EM. The communication skills required to effectively request specialist involvement, respond to consultation requests, and transition patient care to the specialist is not consistently taught in medical schools. The ACGME has made Transitions of Care (TOC) a priority

and is one of the six main focuses of the institutional CLER assessments. In order to address this educational deficit and meet the goals of the ACGME, we designed a 2.5-hour interdisciplinary workshop for EM and OB residents.

Educational Objectives: The goal of this session was to improve the communication skills needed for effective consultation/TOC and to standardize this education for our residents.

The objectives were to:

1. Identify the reasons effective consultations/TOC are important in patient care and to the providers themselves
2. Identify the obstacles to effective consultations/TOC
3. Develop best practices for consultations/TOC between both services

Curricular Design: A facilitated discussion was lead by EM and OB residency faculty to provide background, help identify key issues, and discuss an established model. Interdisciplinary small groups consisting of faculty and residents of all training levels focused on various aspects of consultations/TOC. These included identification of both hazardous and ideal TOC, environmental influences, and troubleshooting disagreements. Role-play by small groups was used to facilitate large group discussion and determine consensus on best practices.

Impact/Effectiveness: Residents rated the session as a 4.4/5 (1: below expectations, 5: exceeds expectations) with verbal comments that reflected their desire to have more training in this area and with other services. Based on resident feedback, this workshop will be given to other specialties and be integrated into GME Orientation in order to standardize these practices in our institution.

76 Communication Skills for Dummies (I Mean Doctors!): Intern Communication Skills Curriculum

Sobehart RJ, Pollock G/University of Pittsburgh Medical Center/School of Medicine, Pittsburgh, PA

Introduction/Background: Communication skills are an essential part of the physicians skill set, yet little time is spent formally developing them as a resident. They are part of the Model of the Clinical Practice of Emergency Medicine but rarely taught in a formal fashion. It is often expected that these skills will be learned by passive observation and by on the job training as residents progress though their residency. Since there is minimal medical literature on the teaching of communication skills, we thought that we could use some of the business literature to better teach our residents how to interact with their patients.

Educational Objectives: The objective of this course is to translate the practical techniques set forth by Dale Carnegie in "How to Win Friends and Influence People" into the unique work environment of emergency medicine.

Curricular Design: The instructional model follows a step-wise, three pronged approach. First the individual learners are provided the book to read and reflect upon without guidance. This is followed by a set of guided self-reflection questions based on the book, which they are to consider before the final session. The course concludes with a faculty moderated small group discussion based on the book and reflection questions. This final session allows the residents to reflect on their initial residency and medical school communication experience in light of the book and gain valuable insight from the attending faculty.

Impact/Effectiveness: This curriculum was well received in its initial iteration this past fall. It serves as the starting point for an ongoing Leadership Series that runs throughout our three year residency curriculum. While no validated evaluation has been used, the feedback has been positive and the curriculum will continue to grow and evolve in the future

77 Residency EMS Education Passport-based Curriculum

Gum W, Jones D, Kornegay J/OHSU, Portland, OR

Introduction: Emergency Medicine (EM) has the closest link to the Emergency Medical Services (EMS). The EM Residency Review Committee states that residents must have "experience in out-of-hospital" patient care, but leaves the content and implementation up to individual residencies.

Educational Objectives: We sought to more clearly define EMS education objectives and improve resident involvement and satisfaction with EMS curriculum.

Curricular Design: We evaluated the current state of EM residency EMS education via literature review and satisfaction survey. We then constructed a passport (Figure 1) with clear objectives in several broad categories (core literature, protocol development, field experience, medical direction, EMS education). The passport provides options so residents can identify personal knowledge gaps and interests, creating a personalized education. To facilitate participation, each resident has a dedicated EMS education day scheduled on EM rotation months. On these days residents have EMS ride-alongs, call center observations, give EMS lectures, and participate in mass gathering or disaster drills.

Impact/Effectiveness: Prior to implementation of the new curriculum, residents were uncertain of specific objectives for EMS education and lacked protected time for adequate involvement. Mean field time over 1 year was 0.4 days/year/resident, with greater than 50% of residents lacking any EMS field experience. Only 3.5% of residents reported satisfaction with the curriculum. In the four months post implementation, the mean field time has improved to 1.5 days/resident, with 55% of residents completing at least one field day. Residents report increased satisfaction, with 65.5% reporting somewhat or very satisfied with the EMS curriculum. We propose that

a structured passport coupled with protected EMS time will have a positive impact on resident EMS education and a statistically significant improvement on resident participation post implementation.

6

Prehospital care—Complete at least 10 of these

Signature from activity leader, can do more if desired

AMR Ridealong (in R1)	
911 Dispatch Center (R1 required)	
MRH Observation	
Medical Director Ridealong 1	
Medical Director Ridealong 2	
Medical Director Ridealong 3	
Medical Director Ridealong 4	
Medical Director Ridealong 5	
Chief ridealong 1	
Chief ridealong 2	
Chief ridealong 3	
Chief ridealong 4	
Chief ridealong 5	
Chief ridealong 6	
Chief ridealong 7	
Chief ridealong 8	

Online Medical Direction—Take 10 calls in R3

MRH training		MRH Call 6	
MRH Call 1		MRH Call 7	
MRH Call 2		MRH Call 8	
MRH Call 3		MRH Call 9	
MRH Call 4		MRH Call 10	
MRH Call 5			

6

EMS Education—Participate in at least 2

Paramedic training (lecture, sim, cadaver lab, etc.)	
Annual EMS inservice	
Annual EMS inservice	

EMS Systems—Participate in at least 1

Tri-county protocol committee	
EMS Operations committee	
EMS CQI committee	
State Oversight Committee	

Figure 1. Passport illustrating objectives.

78 CORD Remediation Task Force – Milestone-based Remediation Toolbox

Gordon D, Kaplan B, Krzyzaniak S, Lawson L, Murano T, Smith J, Weizberg M/Duke University, Durham, NC; University of Colorado Hospital, Devner, CO; University of IL College of Medicine, Peoria, Peoria, IL; East Carolinas, Greenville, NC; Rutgers Newark, New Brunswick, NJ; Brown University, Providence, RI; Staten Island University Hospital, Staten Island, NY

Introduction: The patient care milestones (PCMs) encompass many of the required core skills to be achieved by emergency medicine (EM) trainees. Educators should be provided tools to identify and remediate trainees that struggle to achieve a milestone. For a remediation plan to be effective, the skills must be clearly defined into specific behaviors, which can then be targeted when resident performance is deemed unsatisfactory.

Educational Objectives: The goal of the CORD Remediation Task Force (Subcommittee on PC Milestones) was to develop a guide to aid in milestone-based resident assessment and remediation. The subcommittee sought to provide concrete examples of commonly encountered problems and practical remediation suggestions.

Curriculum Design: Building on tools developed at a consensus conference at the 2009 CORD Academic Assembly, the committee aligned commonly encountered problems in resident performance and SDOTs with the newly defined EM PCMs (Figures). Performance related problems are typically identified by describing an incident or pattern of behavior that does not necessarily utilize milestone terminology. The guide generated by this task force provides scenarios of problematic behavior which can be mapped back to PC sub-competencies. Strategies and tips for remediation for each PC sub-competency were generated. The task force also modified SDOTs to incorporate the PCMs expected for each level of training.

Impact: When faced with a resident who may require remediation for patient care, the program director can turn to these milestone-based tools for guidance and assistance with designing a remediation plan. The guide includes commonly

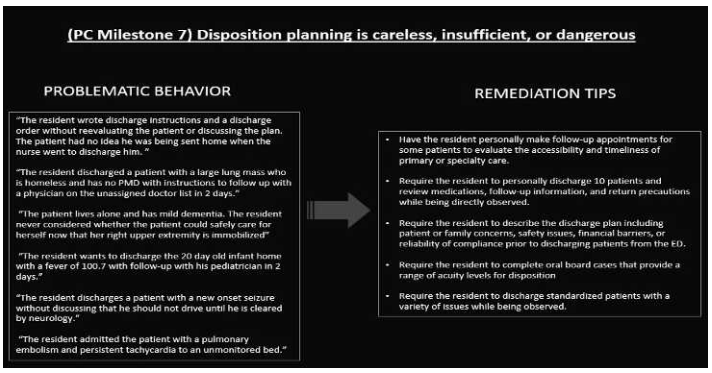
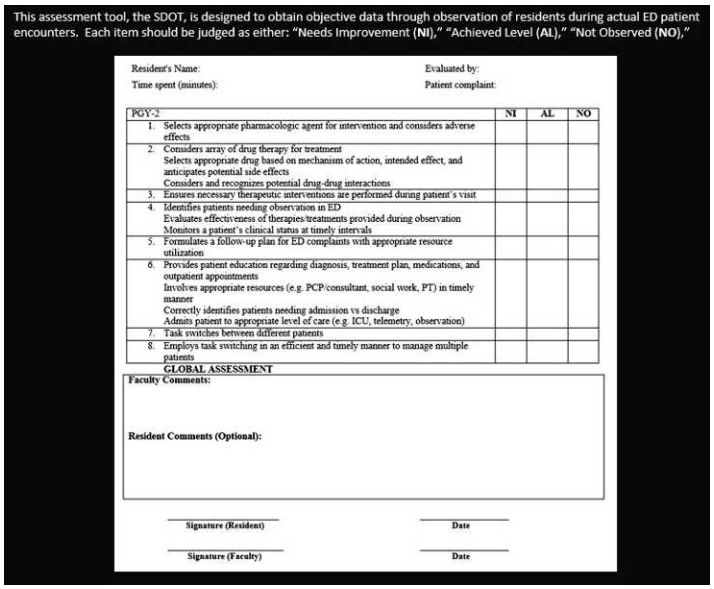


Figure 1. (PC Milestone 7) Disposition planning is careless, insufficient, or dangerous.



This assessment tool, the SDOT, is designed to obtain objective data through observation of residents during actual ED patient encounters. Each item should be judged as either: "Needs Improvement (NI)," "Achieved Level (AL)," "Not Observed (NO)."

Resident's Name: Evaluated by:
Time spent (minutes): Patient complaint:

PGY-2	NI	AL	NO
1. Selects appropriate pharmacologic agent for intervention and considers adverse effects			
2. Considers array of drug therapy for treatment Selects appropriate drug based on mechanism of action, intended effect, and anticipates potential side effects Considers and recognizes potential drug-drug interactions			
3. Ensures necessary therapeutic interventions are performed during patient's visit			
4. Identifies patients needing observation in ED Evaluates effectiveness of therapies/treatments provided during observation Monitors a patient's clinical status at timely intervals			
5. Formulates a follow-up plan for ED complaints with appropriate resource utilization			
6. Provides patient education regarding diagnosis, treatment plan, medications, and outpatient appointments Involves appropriate resources (e.g. PCP/consultant, social work, PT) in timely manner Correctly identifies patients needing admission vs discharge Admits patient to appropriate level of care (e.g. ICU, telemetry, observation)			
7. Task switches between different patients			
8. Employs task switching in an efficient and timely manner to manage multiple patients			
GLOBAL ASSESSMENT			

Faculty Comments:

Resident Comments (Optional):

Signature (Resident) Date

Signature (Faculty) Date

Figure 2. Standardized direct observation assessment tool - EM outcomes assessment PGY-2 patient care 5-8.

encountered problems specific to each milestone, with tips on how to remediate. The SDOTs provide milestone-based tools to evaluate the resident's progress through the remediation process. Collectively, the PCM remediation toolbox can be utilized to improve resident training in the new accreditation system.

79 A Suggested Approach to Remediation of the Medical Knowledge Milestone

Egan DJ, Nobay F, Murano T, Smith J/New York University School of Medicine, New York, NY; University of Rochester School of Medicine, Rochester, NY; Rutgers New Jersey Medical School, New Brunswick, NJ; Brown University, Providence, RI

Background: Since adoption of the EM Milestones, program directors (PDs) are faced with developing new methods of evaluation as well as remediation plans for residents not meeting the expectations for each milestone. The CORD Remediation Task Force has developed toolboxes (literature repositories, recommendations and specific interventions) to assist PDs with this process.

Educational Objectives: The Medical Knowledge Remediation Task Force (MK-RTF) focused on Milestone 15 which uses standardized testing (USMLE and annual in training examination) as markers of EM core content knowledge. The MK-RTF created specific remediation plans to address failure to achieve each of the first four levels of Milestone 15.

Curricular Design: The remediation curriculum focuses on more expanded expectations for each level of Milestone 15 and remediation tools researched and designed to help those not meeting expectations. Level 1 is achieved by passing USMLE Steps 1 and 2 in medical school. These test scores provide early data which may predict the need for MK remediation during residency training. Each subsequent level (2-4) focuses on targeted goals for the in training examination score and annual improvement. The MK-RTF used consensus data and previous research on this topic to specify goals. Key areas of attention and suggested interventions include predicting and assessing knowledge deficits, test taking skills, and psychosocial needs. The MK-RTF also compiled a research database of cross specialty articles PDs can use for supplemental education or curricular guidance in remediation and potential redesign of a residency based curriculum for medical knowledge.

Impact/Effectiveness: The collated resources provided by the MK remediation task force will ease the process of remediation for Milestone 15 across all levels 1-4. This structured approach provides PDs with an easy-to-use and accessible toolbox streamlining options to create remediation curricula for all milestones.

80 Social Media Scavenger Hunt to Bolster Resident Involvement at an Academic Conference

Fix M, Mallin MP, Stroud S/University of Utah, Salt Lake City, UT

Introduction/Background: Current EM residents are accustomed to using smartphone and social media applications for educational needs. Residency programs must adapt to provide educational tools that match resident learning methods. We piloted this during the ACEP Scientific Assembly by having residents participate in a smartphone Scavenger Hunt.

Educational Objectives: Our objectives were to 1. Pilot the use of the application "Scavenger Hunt with Friends" in an educational setting and 2. Evaluate resident comfort with, satisfaction with, and perceptions of this app as an educational adjunct.

Curricular Design: Eight PGY3 residents participated in the scavenger hunt during 3 days at the ACEP Scientific Assembly in October 2013. Residents were assigned 15 tasks to complete by uploading photos through the app. Tasks ranged from photos of "the most important person you networked with" to "the most practice changing abstract." All residents participated and one month later completed a survey about their experience.

Impact/Effectiveness: All residents completed the survey. Most residents found the app easy to use (75%). Although a majority felt they did not attend more sessions (62.5%) or learn more (62.5%) at the conference secondary to the tasks, a majority also felt that the activity was an effective educational adjunct (62.5%) and would like to participate again (62.5%). Residents were more motivated to participate based on the awarding of a prize (62.5%). On a scale of 1-10 (educational to social) the activity was rated as more social with a mean score of 6.38 (95%CI 4.59-8.16).

Conclusion: When used as an educational adjunct at an ACEP conference, a smartphone scavenger hunt app was found easy to use by residents. Despite mixed reviews on its educational value, most would use it again. The majority found this activity more social and less educational. Further research should explore the potential of such activities to supplement traditional educational methods.

81 Development of an Objective Structured Clinical Exam for Competency-Based Assessment of Medical Students in an Emergency Medicine Clerkship

Bord S, McCann P, Saheed M, Liang H, Chang T, Retezar R, Chanmugam A, Jung J/The Johns Hopkins University School of Medicine, Baltimore, MD

Introduction: There is increasing emphasis on competency-based assessment in medical education, as evidenced by initiatives like the Milestones. Currently, assessment often relies on knowledge tests or on subjective measures like "shift cards," These tools may not measure students' ability to independently assess and manage acutely ill patients, core skills emphasized in EM. We developed an objective structured clinical exam (OSCE) to assess students-competency in this area.

Objectives:

- Demonstrate a systematic approach to assessment and stabilization of acutely ill patients
- Perform essential diagnostic and management procedures
- Communicate effectively with patients and care team

Curricular Design: Our OSCE focuses on EM competencies defined by the Milestones, and consists of three stations: two manikin and one standardized patient (SP). In each station, students are examined individually, and must independently assess and manage the "patient." Each station has a confederate "nurse" assisting the student and facilitating case progression. All stations are scripted to ensure consistency. Students are graded using standardized checklists including knowledge and skill items.

- Coma/overdose (manikin): young man found unconscious, ethanol/pill bottles in pockets. Requires dextrose, naloxone, intubation, overdose treatment.
- PE/cardiac arrest (manikin): woman with dyspnea after knee replacement, initially stable but arrests. Requires PE diagnosis, CPR, rhythm recognition, defibrillation.
- Trauma (SP):young woman with abdominal pain after assault. Requires trauma exam, domestic violence screen, C-spine clearance, abdominal ultrasound.

Impact: While psychometric data are not yet available for our OSCE, we expect that it will undergo revision over time to optimize reliability and validity. This exam will provide valuable insight into students' ability to independently assess and manage acutely ill patients, as well as objective data on students – attainment of key Milestones.

82 An Interactive Tablet Based Module on Applying Clinical Decision Rules in Cases of Suspected Pulmonary Embolism

McNamara R, Knettel C, Wald D/Temple University School of Medicine, Philadelphia, PA

Introduction / Background: The ability to access up to date medical information in the emergency department is paramount to providing high quality patent care. With the advent of portable tablet devices such as the iPad, interactive, easily accessible educational resources can now be developed and brought seamlessly to the bedside.

Educational Objectives: Our objective was to develop an interactive module integrating primary sources from evidence based medicine. We focused on how to apply select clinical decision rules in the work-up of a patient presenting with a suspected pulmonary embolism (PE).

Curricular Design: We developed an educational module focused on the application of Well's PE Criteria and PE Rule Out Criteria. The module integrates clinical multimedia along with hyperlinks to PubMed abstracts and full text articles. The draft module was reviewed for accuracy and readability by two board certified emergency medicine (EM) faculty and then by five EM residents for clarity and ease of use. The module is formatted as an iBooks file. It can be viewed using the free iBooks app (version 2 or later) on an iPad (generation 2 and above with iOS5 or later) or iPad mini.

Impact /Effectiveness: With rapidly advancing educational platforms, tablet computers will play a role in bringing medical information to the bedside. Our module was pilot tested by 24 subjects (six medical students, 11 EM residents/fellows, seven EM faculty) and was evaluated for clarity, readability and ease of use. Twenty-one (95.5%, n=22) reported the module was organized and easy to follow, 100% (n=22) noted that it was clearly written and easy to understand. Twenty-two (100%, n=22) reported the iPad format was an effective modality for teaching this topic and 100% (n=22) noted that they were able to easily navigate through the module using an iPad. All (n=22) would recommend the module to another learner and were satisfied (45.5%, 10/22) or very satisfied (55.5%, 12/22) with the module.

83 Introduction of Protected Academic Shifts to the PGY1 Emergency Medicine Curriculum – How is the Time Used?

Chen L, Beeson MS, Bradford A, Warrington S, South A/ Akron General Medical Center, Akron, OH

Introduction: In the academic year 2012-2013 the EM Residency Program at Akron General Medical Center

incorporated three "academic" shifts into the PGY1 monthly ED schedule, with a likewise decrease in monthly clinical shifts. We report how PGY1 residents utilized their protected academic shifts and discuss the benefits.

Background: Bloom's Taxonomy of learning is the widely accepted framework of the cognitive learning process. Knowledge and understanding form the base of the pyramid, followed by application, analysis, synthesis, and evaluation. Traditional EM residency education consists of PGY1 residents surpassing upper level residents in clinical shifts. This structure promotes PGY1 residents into the "application" level of the pyramid prior to a strong foundation in knowledge.

Educational Objectives:

1. Provide protected time to develop a solid foundation of medical knowledge to facilitate application to clinical care.
2. Provide time to complete residency requirements, specifically online test completion, procedure documentation, follow-up documentation, lecture preparation, etc.

Curricular Design: When assigned to the emergency department, each PGY1 EM resident is assigned 18 ten-hour shifts and three academic study shifts monthly. Residents document their time use.

Impact/Effectiveness: 11 PGY1 EM residents participated. Table 1 demonstrates academic shift time use. In-Training Examination (ITE) results showed improvement between the 2012 and 2013 years, 68.7 (SD 6.1) in 2012, and 71.2 (SD 5.1) in 2013, 95% p-value of (0.41).

Conclusion: Bloomss Taxonomy of Learning demonstrates that the highest level of learning occurs when a concrete knowledge base is first constructed. Subjecting PGY1 residents to a large number of clinical shifts prior to building the knowledge base may be counterproductive to efficient progression of learning. Although not statistically significant, there was a trend towards increased ITE scores following this curricular change.

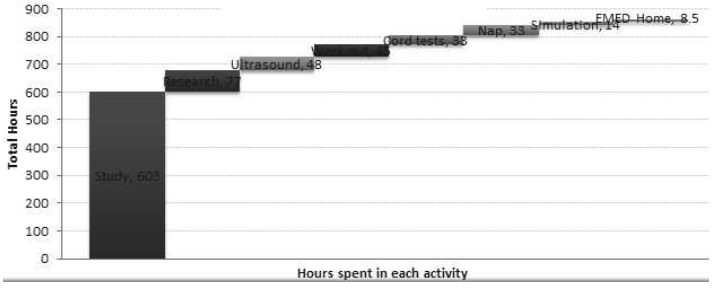


Figure 1. Study shift breakdown.

84 Innovating Ultrasound Education: Implementation of a Longitudinal, Progressive, Modular Ultrasound Curriculum Combining Didactics Using an Audience Response System with Hands-on Scanning

Dearing E, Baran E/Northwestern Medicine, Chicago, IL

Background: The Accreditation Council of Graduate Medical Education mandates competency for all Emergency Medicine residents in emergency ultrasound (EUS) and the American College of Emergency Physicians (ACEP) has put forth specific guidelines for residency-based ultrasound education. The ACEP guidelines state that in addition to introductory training, longitudinal didactic and hands-on instruction should be provided.

Objectives: We sought to supplement our introductory ultrasound course with a longitudinal curriculum that meets ACEP recommendations. Goals included integrating EUS into our modular curriculum during normal conference hours, providing opportunities for progressive learning, incorporating image review and direct feedback by use of an audience response system (ARS) and providing hands-on scanning.

Curricular Design: We designed eleven two-hour sessions applying the ACEP core ultrasound applications to our modular curriculum that repeats every two years (Table 1). Each session is divided into junior (PGY 1-2) and senior (PGY 3-4) learners allowing for a more directed small-group setting and differentiated learning experiences. Each group alternates between one hour of interactive lecture using an ARS and one hour of hands-on scanning using simulated patients or models. The ARS provides an interactive educational experience that allows for image review, feedback and evaluation.

Effectiveness: Our curriculum has shown to be a successful way to implement the recommendations set by ACEP. Resident surveys show that our curriculum is well received. Average overall evaluations: Poor (Bottom 5%) 1%, Fair 6%, Neutral 34%, Good 45%, Excellent (Top 5%) 10%. ARS scores have tracked individual learners and shown better senior learner performance up to 20% above junior learners. Limitations to implementation primarily include development of ARS sessions and funding for unique resources: ARS devices, core ultrasound faculty instructors, and standardized patients/models.

Table 1.

	Module System/s	Ultrasound Application/s
1	EMS	EFAST
2	Ophtho/ENT/Derm	Ocular, PTA
3	Tox/Env	Potpourri
4	Resus/Anesthesia	IVC, ETT, IV Access
5	Pulmonary	Thoracic
6	Cardiology	ECHO
7	GI	Biliary, Bowel
8	Renal	Renal, Bladder
9	OB/gyn	OB/gyn
10	Ortho	Musculoskel, procedural
11	Gen/Vasc Surgery	AAA, DVT

85 An Efficient, Cost-Effective and Secure System to Increase the Rate of Return of 4th Year Medical Student Evaluations

Huancahuari N, Brooks J, Wittels K/Brigham and Women's Hospital/Harvard Medical School, Boston, MA

Introduction/Background: Timely completion of 4th year rotating medical student evaluations in the emergency department (ED) is critical for providing necessary feedback, accurate grading and composing a standardized letter of recommendation. Due to competing responsibilities and a cumbersome process, faculty often fail to complete these evaluations in a timely fashion or even at all.

Educational Objectives: We aimed to develop an efficient, cost-effective and secure system that (1) increases the rate of return of 4th year medical student evaluations by faculty and (2) improves faculty satisfaction with this new evaluation process.

Curricular Design: The new evaluation process we created supplanted our outdated paper system. Using a commercially available survey tool, SurveyMonkey, we created an electronic evaluation system that is easy to distribute, navigate and collect. The tool has enhanced security that allows for confidential and safe transfer of student information. Electronic evaluations are sent weekly to all faculty scheduled to mentor a student during a clinical shift. Faculty can complete these evaluations via computer, tablet or smart phone. Within each evaluation, the students- name, institution and photo are included. The evaluations consist of check boxes and a free text section. Completed evaluations can be exported and tabulated to facilitate final grading.

Impact/Effectiveness: We are currently conducting a study to objectively determine the new rate of return of completed 4th year medical student electronic evaluations. Preliminary data suggest significant improvement over prior years. Faculty feedback has been overwhelmingly positive. The cost-effectiveness and adaptable design of our electronic medical student evaluation system allows it to be implemented at other institutions and across all specialties.

86 Simulated Thoracotomy Model

Medwid K, Rosenwald R, Gang M/Bellevue/NYU Department of Emergency Medicine, New York, NY

Introduction/Background: Simulation affords residents an opportunity to develop an approach for rapid assessment and treatment of patients presenting with high acuity, low frequency clinical events in a safe learning environment. A thoracotomy is a procedure that is infrequently performed in the emergency department and would benefit from simulation; however, realistic models are expensive and hard to find.

Educational Objectives: Our objective was to develop a realistic, low cost, reusable model to facilitate hands on learning for the low frequency, high acuity procedure of an emergency thoracotomy.

Curricular Design: A trauma scenario was developed to incorporate proper indications for an emergency thoracotomy. A task-trainer was devised to facilitate hands on learning of the thoracotomy procedure. Using the IMSH model as a template, we took the frame of a Laerdal manikin and secured PVC pipe to act as a sternum by drilling into the base of the manikin. One end of an ET tube was hot-glued into the base of the manikin, the other secured to the PVC pipe to act as a rib. We then inserted jello-filled balloons for the aorta, vena cava, esophagus and heart. A plastic bag simulated the pericardium. A manikin lung was inserted that could be inflated with a BVM during the simulated thoracotomy, and tan shelf liner was velcroed in place to simulate skin (Figure 1). High fidelity simulators were used for initial resident assessment and stabilization of the trauma patient. The residents were then transitioned to the task trainers to practice the thoracotomy.

Impact/Effectiveness: This low cost, simulated task trainer was designed to provide valuable procedural experience for our residents and positively impact patient care. Residents who completed a post-simulation survey all agreed that the model was an effective way to learn and practice the procedure.

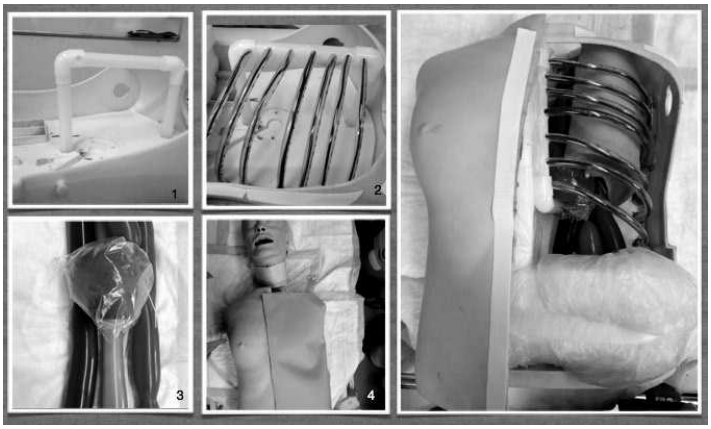


Figure 1. Thoracotomy model.

87 Development of an Introductory Ultrasound Curriculum for Medical Students

Chang T, Hoffmann B, Bord S, Jung J/Johns Hopkins Department of Emergency Medicine, Baltimore, MD

Introduction: The role of bedside ultrasonography (BUS) in many fields has steadily grown, and BUS was listed in the Milestones as an essential competency for EM physicians. Despite this, it remains one of the least taught and assessed skills in EM clerkships for medical students, and many students do not begin residency at Milestone Level 1 in this area. We developed a brief curriculum to teach and assess core BUS skills for students, focusing on the extended Focused Assessment with Sonography in Trauma (e-FAST) exam as a basic and essential application of BUS.

Objectives:

- Demonstrate basic operation of the ultrasound machine
- Perform an e-FAST exam, obtaining adequate images
- Interpret e-FAST images

Design: Our curriculum is integrated into simulation sessions for our required EM clerkship, and includes 3 components:

- Introduction: high-fidelity trauma simulation in which students must request FAST and interpret images to "save the patient." Debrief covers indications for FAST, fundamental ultrasound concepts, and image interpretation.
- Practicum: 30-min didactic on ultrasound theory and machine operation, followed by a 60-min precepted session in which students practice e-FAST exams on each other.
- Assessment: 30-min standardized patient scenario depicting an unstable trauma victim with abdominal pain, embedded in an objective structured clinical exam. Students are required to perform for FAST exam and interpret images, and are graded by faculty in real-time using a structured checklist.

Impact/Effectiveness: Prior studies have demonstrated the effectiveness of brief educational interventions in BUS. While we do not yet have outcome data for our curriculum, we are optimistic it will result in reasonable proficiency in basic ultrasound for our students. Objective assessment of practical skills will facilitate needed refinement of the curriculum to optimize outcomes, and allow us to document students' achievement of this important Milestone.

88 Hi-Fi Simulation Doesn't Need to Break the Bank: A Low-cost Homemade Transvenous Pacemaker Insertion Simulator

Luber SD, Chathampally Y, Carlson P/The University of Texas Medical School at Houston, Houston, TX

Background: Transvenous pacemaker insertion (TVPI) is a relatively rare and potentially life-saving procedure that Emergency Medicine residents are expected to learn and perform during their training. Since the procedure is infrequently performed on live patients, simulation provides a means to train residents in proper placement.

Objectives: Due to lack of live-patient exposure to TVPI, we set out to design and build a low-cost, stand-alone simulation model for TVPI utilizing the electrocardiogram (ECG) guided technique that automatically changes ECG tracings based on depth of insertion. Importantly, TVPI is a two-part procedure: placement of a central venous line (CVL) and placement of the TVP itself via introducer sheath. Since CVL simulators are commercially available and we already have simulation sessions for CVL, we focused on the simulation of placement of the TVP.

Design: Utilizing components purchased online and "borrowed" from the ED (mannequin, pacemaker introducer sheath, tubing, Arduino prototyping platform, breadboard, photo sensors, jumper wires), we were able to build the TVPI simulator for less than $50. Our setup also involved writing code for the Arduino and open-source software, Processing. The coding/design of the simulator is such that as the pacer wire is threaded through the introducer into the mannequin, multiple static ECG images on an attached laptop automatically change based on the distance the wire has been inserted. Proper placement is confirmed when a right ventricle tracing is achieved.

Impact: Due to the cost-effectiveness of this simulator, we were able to build three identical simulators. This allows us to run several stations simultaneously during our lab time and provides the residents multiple opportunities to practice the procedure. We have not performed an assessment of the effectiveness of the simulator; however, residents have expressed greater comfort in their skills to perform the procedure.

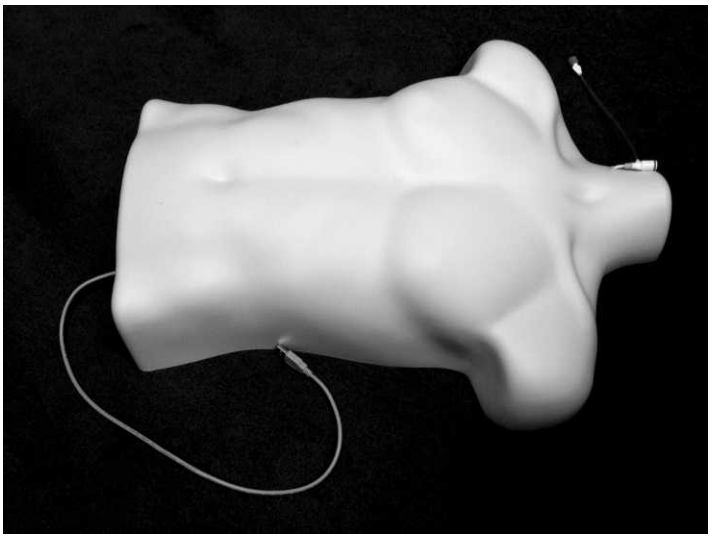


Figure 1. Front of homemade simulator.

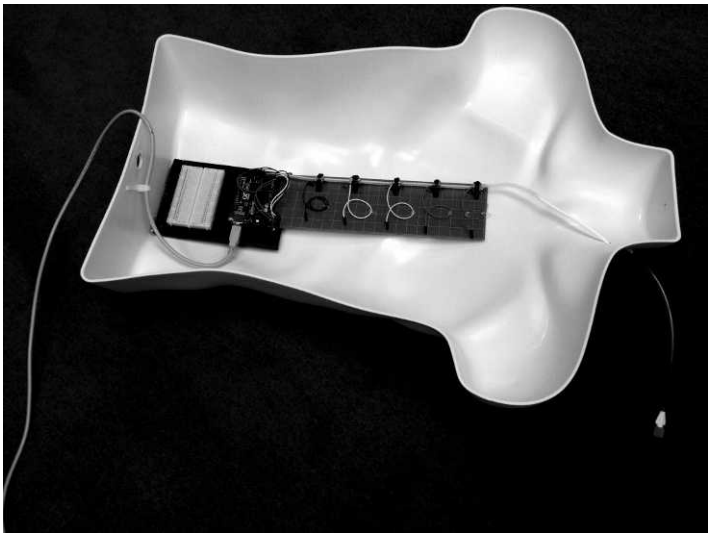


Figure 2. Back of homemade simulator.

89 Tracking Resident and Program Patient Encounters by Clinically Meaningful Disease Categories

Manning J, Kuehl DR/Virginia Tech Carilion Department of EM, Roanoke, VA

Background: In emergency medicine (EM), we track resident procedures, such as central lines, but do not track encounters for diseases, such as myocardial infarction. It is unclear how many patient encounters of a disease category are necessary for a resident to become competent but to date there has been no way to reliably obtain this information. Residency programs may also be unaware of how their institution's patient encounters reflect the model practice of EM. While programs have ready access to data from their electronic medical record (EMR), there is no unified or simple method of tracking the specific conditions a resident sees in the EM training period.

Objective: Develop a software tool that provides an easy method to track types of patient conditions during resident patient encounters.

Design: The Healthcare Cost and Utilization Project (HCUP) developed the Clinical Classifications Software (CCS) as a categorization scheme of the diagnoses and procedures found in the ICD-9 coding system. Over 15,000 diagnosis and 3,900 procedure codes have been condensed into a smaller number of clinically meaningful categories. We used the single level and multilevel CCS and grouped them into the five key EM patient types: Trauma, OB/Gyn, Medical, Psychiatric, and Pediatric. The CCS was further categorized by the EM model practice areas, resulting in 13 subcategories of patient disorders.

Outcome: This new package was used with ICD-9 discharge diagnoses obtained from EPIC (Verona, WI, 2011) and simple queries with Microsoft Access (Redmond, WA, 2010) to easily demonstrate the number and type of patient encounters seen by individual residents. This easy-to-use open source product can be used by any residency program to track patient encounters. Results from this tool can provide data for summative competency assessments. This software may also be used to identify encounter type deficiencies in an individual resident or program and provides us with a new research tool.

90 Integrating Kessler's 5C Method of Communication for Emergency Medicine Resident Consultant Communication: A Process Improvement Survey

Bohrn M, Vega DD, Kochert E, Stuntz R, Bluett R/York Hospital York, PA

Introduction/Background: Kessler's 5C Method of Consultant Communication - Contact, Communication, Core Question, Collaboration, Close the Loop - has been developed as a method of standardizing consultant communication from the Emergency Department (ED). We sought to utilize this standardized framework for a communication education/performance improvement project. This project was deemed exempt by the IRB. Educational Objectives: Improving compliance with the global 5C format, and improving utilization of each component of the 5C method.

Curricular Design: EM residents received introductory sessions with discussion of the 5C Method and how to implement it for consultant calls. Follow-up/add-on experiences include using the 5C method for case discussions during conference, during oral board case simulations, and during simulation cases. Key concepts were reinforced periodically via live discussion, email reminder, and during ED clinical care. Consulting faculty and residents were surveyed pre/post-intervention, anonymously via Survey Monkey, on global communication success, as well as individual 5C Component success during ED communications. A five-point scale listed the frequency of each component (1=Never, 2=Sometimes, 3=Often, 4=Most times, 5=Always). Means were collected and compared.

Impact/Effectiveness: n=12 in the pre-survey and n=7 in the post-survey (project ongoing). Surveyed the mean communication effectiveness improved overall (post-mean: 4.1 versus pre: 2.6) and in each category: Introduction/rank: post-mean: 3.6 versus pre: 2.4 Clear Purpose/Clinical Question: post: 3.1 versus pre: 2.9

Clear History: post: 3.7 versus pre: 2.6

Labs/studies available: post: 3.8 versus 2.9. Sample size and response rates are low. Results statistically insignificant, but overall process appears to have some positive impact on surveyed perceptions of emergency medicine resident use of 5C components by consulting physicians.

91 A Novel Approach to Quality Improvement and Safety – Resident Patient Safety Committee

Finnie JL, Husain A, Weizberg M/Staten Island University Hosptial, Staten Island, NY

Introduction/Background: The New Accreditation System mandates resident participation in quality improvement and patient safety programs. Incorporating this new requirement can pose a challenge for emergency medicine (EM) residencies. Achieving the educational goals of residencies and facilitating active, engaging, and self-reflective learning methods can be challenging.

Educational Objectives: Residents were encouraged to develop creative solutions to our education and accreditation requirement and subsequently formed the Resident Patient Safety Committee (RPSC). The curricular objectives were to engage residents, facilitate learning to work with multiple stakeholders, and oversee projects to improve patient safety. This design allows residents to direct their own learning and

simultaneously improve safety for our patients.

Curricular Design: The committee consists entirely of residents and is chaired by a PGY3 resident. The agenda for the committee is determined by the residents. The committee chair reports findings and recommendations to the residency director. Residents first identified a working problem list, and then organized these into short and long term goals. Short-term goals included improving lab delivery, particularly for blood cultures, while long-term goals focused on improving communication between staff and decreasing electronic medical record (EMR) errors.

Impact/Effectiveness: Residents identified a major problem with blood culture delivery. They worked with lab and clerical supervisors to decrease the incidence of lost blood cultures. Since implementation of these changes, the lab reports a significant decrease in lost blood cultures. Other projects currently in progress include improvements in staff communication and improvements to the EMR to decrease medical errors, such as a confirmation screen and photo for critical medications. The implementation of a RPSC was a successful method to comply with the new requirements.

92 Can We Teach Technology by Technology? A Novel Approach to teach Ultrasound by Multimedia

Pourmand A, Shokoohi H, Armstrong P/George Washington University, Washington, DC

Background: Accurate identification of intra-abdominal free air consistent with a critical illness will prompt an early surgical intervention with an improved patient outcome. Historically, plain radiography has been used to diagnosis free air in the peritoneum, but the lack of sensitivity, as low as 38-46%, reduces its utility. CT is a very sensitive for free air, but can be very time-consuming, and utilizes an even greater degree of ionizing radiation. With current widespread use of bedside ultrasound (US) in patients with abdominal pain, it is increasingly likely that patients presenting with an acute abdomen will have a bedside ultrasound performed by an emergency physician (EP) or surgeon as part of their evaluation. In this project we present an interactive online Case Based Reasoning (CBR) module for the training of medical students and residents through: increasing sensitivity of diagnosing free air, decreasing complications of CT scans, and decreasing miss rate by detecting cases in patients who might otherwise not receive imaging.

Methods: The learners will be randomized to four cohort groups (multimedia-based training, practical training, combination training using both multimedia-based + practical training, no training [control group]).

Multimedia-based training is composed of illustrations of pneumoperitneum and methods of ultrasound identification of a perforated viscus. This is an interactive multimedia module that consists of audio, bedside ultrasound video capture, and also combines animation with bulleted learning points. Participants will be measured based upon 1) Ability to execute after multimedia-based training, 2) Ability to execute after practical training, 3) Learner-s knowledge retention, 4) Comfort level applying concepts, and 5) General satisfaction.

Future direction: Upon completion of module, it will be available free online for:

1) Medical Student education
2) Medical Resident education
3) Continuing medical education

93 Emergency Radiology: Developing a Curriculum to Improve Competency in Radiograph Interpretation

Calandrella C, Yoneda N/New York Hospital of Queens, Flushing, NY

Introduction: Interpretation of radiological images such as X-Rays and Ct scans is an essential skill for the emergency physician (EP). Despite the importance of this skill, a standardized curriculum regarding the education of radiographic imaging does not exist.

Educational Objectives: In recognition of the importance of Plain film and CT scan image interpretation to the clinical practice of emergency medicine, we proposed to develop a curriculum for radiographic competency

1. Develop a didactic education program where residents interact with faculty to improve their interpretation of images.
2. Use of radiology department to facilitate the education of residents.
3. Interpretation and utilization of the appropriate available radiological modality.
4. Administer an annual exam to monitor progress of each resident's skill.

Curricular Design: Utilizing a list of radiographic diagnosis that is used by Radiology residents training in Emergency Radiology, we developed a curriculum to educate Emergency Medicine residents for plain film and CT scans. Nine hours of didactic time is allotted to radiology education each year. Lectures are conducted in a traditional didactic lesson for the first thirty minutes and then concluded with a Socratic approach led by a radiologist that explains the methods of reading each modality and then reviewing pertinent cases together as a group.

Impact: In 2011, residents were provided with a survey using a Likert scale to determine their satisfaction with radiology education prior to instituting a specific curriculum. They were polled again in 2013 to determine the effectiveness of a radiology course. Initially, only 66% of residents were

satisfied with their radiology education and 90% felt it was important to have dedicated radiology education where 60% spent less than 5 hours independently studying radiology. After 2 years, 87% of residents felt improved satisfaction regarding radiology education with use of a curriculum.

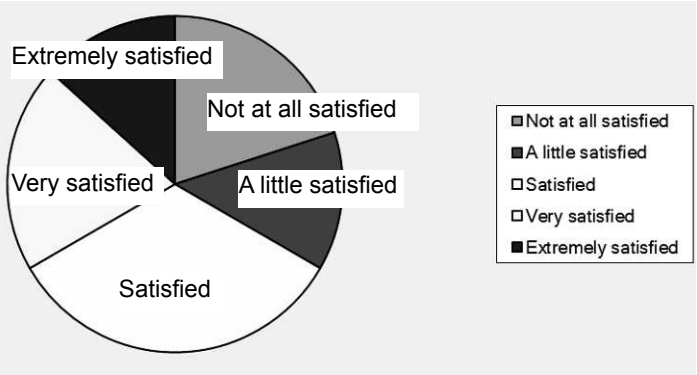


Figure 1. Are you satisfied with the current radiology content covered in conference lectures? (Data from 2011)

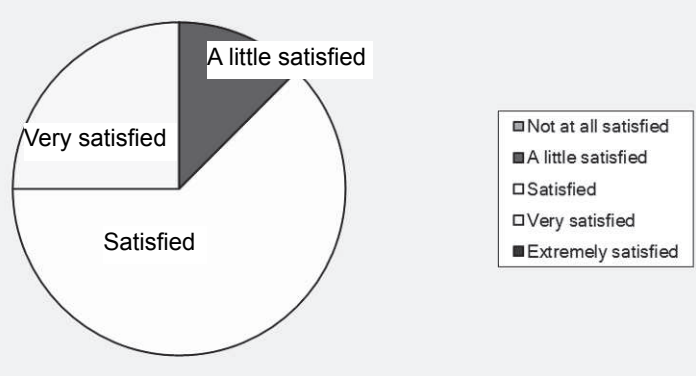


Figure 2. Are you satisfied with the current radiology content covered in conference lectures? (Data from 2013)

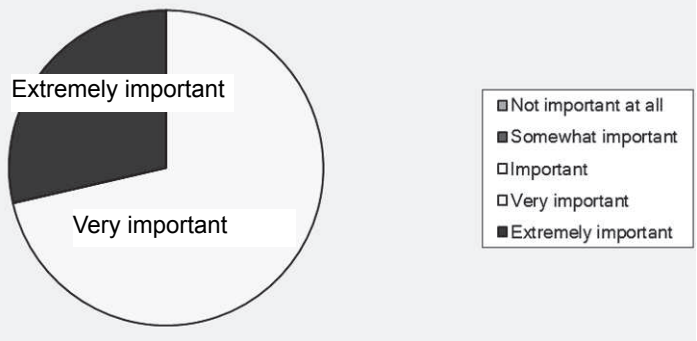


Figure 3. Do you think it is important to have a dedicated radiology curriculum incorporated during your Emergency Medicine education? (Data from 2011)

94 Emergency Clinical Problem Solving (ECPS) – A Model Capstone Curriculum for 4th Year Medical Students

Zgurzynski P/University of Massachussetts, Worcester, MA

Introduction: The AAMC recommends "all medical schools adopt an explicit set of clinical skill education objectives." To meet this goal and to prepare medical students for transition to residency, establishing a successful capstone course in acute care problem solving is an important curricular innovation.

Educational Objectives:

1. Identify an emergency across clinical settings
2. Evaluate high risk undifferentiated patients and generate a differential diagnosis using advanced clinical reasoning methods.
3. Perform patient management: assess acuity, stabilize, and treat. Secondary objectives were to understand a multidisciplinary team approach, best practices in communication and re-integrate basic science material.

Curricular Design: Under EM sponsorship, ECPS was implemented as a four week required pass/fail course in a curriculum re-design. A consensus group of educators designed the curriculum to include: lecture, simulation, and clinical experiences in the ED, using the CDEM consensus fourth year curriculum in EM as a starting point. The course begins by teaching the approach to the undifferentiated patient, progressing through eright high risk chief complaints, and then cumulating with arrest scenarios. (Table 2) Didactics are matched to a high fidelity clinical scenario. Sessions on CPR, airway management, and vascular access are taught and integrated into scenarios. Lectures on advanced diagnostic reasoning focus on dual process theory and use of cognitive checks. Learning modules on CDEM curriculum.org, video and quizzes were made available. Educators require high fidelity mannequins and task trainers. Difficulties in implementing the curriculum have been faculty development in simulation, need for a clinical coordinator, and engaging learner in the lectures.

Impact/effectiveness: Thirty-seven students have completed the course. (Table 1) Simulation and crisis management training and were the highest rated components in helping students learn the material.

Table 1. Medical Student Assessment of ECPS Course through E*Value.

Evaluation Topic	Rating
Generating a Differential Diagnosis	3.68/4.00
Crisis Management Training	3.92/4.00
Simulation	3.86/4.00
Overall course rating	3.47/4.00

Table 2. ECPS Curriculum Overview: Scope of Content

Week	Didactics (Mon)	Simulation topics (Tues)	Didactics (Wed)	Clinical Shifts (Thu-Sun)
1	• Education Contract, Objectives/ Overview • Approach to the undifferentiated patient • Approach to Emergent Patient • Focused HPI • SNAPPs/ ASOAP	• Undifferentiated patient simulation cases • Teamwork didactics	• Empathy • Overview Advanced Diagnostic Reasoning • Clinical Decision Rules and Meta cognition • Diagnostic reasoning CPC Format • Introduction to the clinical experience	• Students work 2 shifts per week at a community or academic ED site.
2	• Approach to Chest Pain • Approach to Arrhythmia • Approach to SOB • Lunch Break (12-1PM) • Simulation procedures stations (1-3PM)	• Approach to Life Saving Procedures • Approach to Life Saving Procedures Integrated Cases Part 1	• Student Case Presentations • Altered Mental Status • Patient Safety • Mental Status Change w/ Transition of Care (SBAR)	• Students work 2 shifts per week at a community or academic ED site.
3	• Fever R/o Sepsis EGDT • Sepsis Cases • Approach to Arrest • End-of-life discussion • Mid rotation feedback (1-3:30PM)	• Life Saving Procedures with Integrated Cases Part 2 • Mid rotation feedback (1-3:30PM)	• Approach to Abdominal Pain • Cases Abdominal Pain • Approach to Undifferentiated Shock • Approach to Bleeding	• Students work 2 shifts per week at a community or academic ED site.
4	Holiday	• Jeopardy • Life Saving Procedures Integrated Cases Part 3 • Summative Review	• Completion of Clinical Shifts	• Completion of Clinical Shifts

95 Teacher of the Day: The Impact of a Dedicated Faculty Teaching Shift on Clinical Education

Stuntz R, Bohrn M, Kochert E/York Hospital, York, PA

Background: In the Emergency Department (ED), time is at a premium, and clinical teaching in Emergency Medicine (EM) can be difficult.

Objectives: Our goal was to improve clinical teaching by providing a dedicated faculty teaching shift, free from clinical responsibility.

Design: This was done in a community based academic institution with an emergency medicine residency with approximately 77,000 ED visits per year. Pre- and post-implementation surveys were sent to both faculty and residents to assess perceptions regarding time for teaching and the utility of a dedicated teaching shift, as well as the impact of the TOD on clinical teaching and any feedback and suggestions for improvement. Surveys were optional and anonymous. The teaching shift was implemented for two months. On weekdays, a faculty member was scheduled to be the teacher of the day (TOD) for a three hours. The TOD was required to perform one Standardized Direct Observational Tool (SDOT) per shift, but could otherwise teach at their discretion free of clinical duties.

Impact/Effectiveness: 44 subjects participated in the pre-implementation survey (24 residents, 20 faculty). 32/44 (72.7%) felt there was not adequate time for teaching during shifts. 28/44 (63.6%) felt that despite this, adequate teaching was performed on a daily basis. 36/44 (81.8%) of those surveyed felt the TOD would be helpful to improving the amount of clinical teaching that occurred. 34 subjects participated in the post-implementation survey (17 residents, 17 faculty). 28/34 (82.3%) felt that there was adequate teaching being performed on a daily basis. 22/34 (64.7%) felt the TOD was helpful in improving clinical education. The initiation of a dedicated TOD with no clinical duties improved perceptions of the level of teaching and was overall perceived as helpful to improve clinical teaching in our ED. We feel that the TOD serves as a useful adjunct to improve clinical teaching in EM residencies.

96 A Proposal to Develop and Utilize Multi-Source Feedback Tools to Assess Competencies of Practicing Emergency Medicine Residents in the United States

LaMantia J, Yarris L, Sunga K, Weizberg M, Hart D, Tupesis J, Farina G, Rodriguez E, Lockyer J/North Shore University Hospital, Manhasset, NY; Oregon Health and Science University, Portland, OR; Mayo Clinic, Rochester, MN; Staten Island University Hospital, Staten Island, NY; Hennepin County Medical Center, Minneapolis, MN; University of Wisconsin-Madison, Madison, WI; Long Island Jewish Medical Center, New Hyde Park, NY; Upstate Medical University, Syracuse, NY; University of Calgary, Calgary, Canada

Multisource feedback (MSF), also referred to as 360 degree feedback, is a questionnaire-based feedback tool

that gathers information on individual performance from a variety of perspectives. Widely used in human resource and industrial settings, MSF collects feedback not only from managers/supervisors but from all people within the individual's circle. This study will assess the reliability, validity, and feasibility of MSF in emergency medicine (EM) education in evaluating resident performance. There is increasing interest in ensuring that residents adequately demonstrate a wide range of competencies. We predict that MSF can fulfill this important need by providing a more holistic representation of resident competency.

This innovation seeks to provide feedback and guide performance in areas such as professionalism, empathy, and interpersonal skills.

Surveys with 26, 27, and 13 items were developed by consensus to assess EM residents by eight physicians, eight non-physicians (nurses, physician assistants, etc.) and 25 patients respectively, using a 5-point scale. Each resident selected the physician and non-physicians and completed a 30 item self-assessment. The items on each survey addressed competencies grouped under the domains of interpersonal skills, professionalism, practice-based learning and improvement, systems based practice, and patient care.

Preliminary on-going analysis used 46 residents. The mean number of physician, non-physician, and patient evaluators per subject was 6.5, 6, and 12 respectively. Cronbach's alpha was 0.96 for the physician survey, 0.98 for the non-physician survey, 0.94 for the patient survey, and 0.98 for the self survey, suggesting very high reliability of all surveys- internal consistency. Physicians, non-physicians, and residents gave highest ratings for Professionalism and lowest ratings for Systems Based Practice. The patients rated the residents highest on Interpersonal Skills and lowest in Practice Based Learning.

97 Assessing the Need for a Structured Curriculum During Attendance at an Emergency Medicine National Conference

Blazejewski A, Rosen A, Golden D, Clark S/New York Presbyterian, New York, NY

Background: Emergency Medicine (EM) residents are required to complete a scholarly project prior to graduation. To encourage scholarly activity, many programs send residents, at considerable expense, to a national conference. We know of no formal curriculum that ensures residents maximize the value of this conference experience.

Objectives: To assess the need for EM residents to attend a national conference for a structured curriculum during the conference to augment programming and encourage scholarly activity.

Methods: We surveyed 2nd year EM residents in a large, urban 4-year residency program prior to attending a national EM conference. Self-administered questionnaires were created by the investigators to assess progress of the scholarly project prior to the national conference, and to assess the perceived need for conference attendance and a structured curriculum.

Results: Twelve residents (100%) completed the survey prior to attending the national conference. Seven respondents (58%) reported being intimidated by having to do a scholarly project, and 67% reported little or no progress towards the scholarly project before the conference. 75% felt that they were not given enough time during residency to complete a scholarly project. Sixty-seven percent felt the residency did not teach skills for idea development and 100% thought the residency did not teach skills for study design, 17% reported feeling unprepared to attend a national conference.

Conclusions: EM residents at a large, academic residency would benefit from a curriculum to maximize the value of a national conference. Prior to conference attendance during 2nd year, few residents had made tangible progress towards a scholarly project and felt intimidated and poorly prepared for this required residency activity. We plan to assess the long-term impact of this curriculum on the quality of scholarly projects.

98 A National Needs Assessment of Emergency Medicine Resident-as-Teachers Curriculum

Ahn J, Jones D, Fromme B, Yarris L /University of Chicago, Chicago, IL; Oregon Health and Science University, Portland, OR

Introduction: The LCME and ACGME require that residents engage in teaching in order to develop skills as educators. Residents spend an estimated 20% of their time teaching; many do not receive training for this role. Although proposed guidelines for an Emergency Medicine (EM) resident-as-teachers (RAT) curriculum were published in 2006, there are no follow-up descriptions of RAT curriculum development, implementation, or outcomes. A necessary first step of developing a formal RAT curriculum for EM educators to pilot, implement, and evaluate is to conduct a formal needs assessment.

Objectives: The aim was to conduct a needs assessment of EM residency programs regarding RAT curricular resources and practices.

Methods: We invited all EM residencies to participate in a web-based survey assessing current RAT curricula and needs. We used a previously published survey instrument that had been implemented in pediatric residencies, and made minor modifications to fit our EM audience.

Results: 49% of 3-year residencies have a RAT curriculum in place, while 86% of 4-year residencies have a RAT curriculum. At university-based residencies, 60% of programs have a RAT curriculum, versus 50% of programs based in the community and 75% in county based programs. At programs with a required medical student rotation, 59% of programs have a RAT curriculum.

Among programs that had no RAT program, 14% have a program in development, and 18% have a teaching resident program but no formal curriculum. Other programs cited lack of interest, limited resources, and lack of time in curriculum as reasons for not having a program.

Conclusions: Analysis of our data indicates that despite ACGME and LCME mandates, there is a lack of consistent RAT curricula. A national curriculum is one solution to this problem. Most all of the responding programs are interested in the development of a web-based national curriculum. Our results may inform collaborative efforts to develop a national RAT curriculum.

99 Intern Orientation Boot Camp Based on CLER

Wills CP, Gavin N, Subramanian I, Hern HG/University of California San Francisco, Oakland, CA; New York University School of Medicine, New York, NY

Background: The ACGME has shifted the focus of GME to heavily emphasize patient safety and quality improvement (QI). Resident involvement and education in patient safety and QI are now required. Most hospital orientation programs are new-employee on-boarding processes and do not cover these now mandatory disciplines. We sought to remedy this gap in hospital orientation. Educational Objectives: Using the Clinical Learning Environment Review (CLER) program as a conceptual framework, we created a one-day boot camp based on the six focus areas of CLER to introduce incoming interns to CLER focus areas and engage them in hospital QI activities.

Curricular Design: New interns in the emergency medicine, surgery, internal medicine, and oral maxillofacial residencies were divided into six multidisciplinary teams. In the morning session, teams rotated through six small group sessions led by physicians, nurses, quality officers, and nursing discussing patient safety, transitions of care, professionalism, patient centered care, supervision, and fatigue and stress management. Sessions were located throughout the medical center to better acclimatize interns to their new workplace. The lunch intersession consisted of a panel discussion with directors of quality and patient safety and the chief medical officer. In the afternoon session, teams admitted a mock patient utilizing the electronic health record and other IT systems. Lastly, each team responded to a mock code blue.

Impact: We created an orientation introducing new interns to the culture of safety and quality improvement processes based on the six focus areas of a CLER visit. Surveyed at the conclusion of the day, 97% of participants rated the boot camp as good, very good, or excellent. Sessions with highest satisfaction included sessions on transitions of care, professionalism, and the code blue. Using the CLER focus areas, we introduced and established the importance of patient safety and QI to new interns.

AM Session locations	Patient Safety/Floors and ICU	Transitions of Care: Signing Out and Consulting/ 8th Floor Call Rooms	Patient Centered Care and Communication/ ED Conference Room (in ER)	Fatigue, Stress, and Physician Impairment/ 6th Floor EM Conference Room	Profession-alism/ Classroom A	Supervision:High Risk Meds&Procedures/ Classroom B
8am: Orientation	All teams	All teams	All teams	All teams	All teams	All teams
8:20 move to 1st group						
8:30 rotation 1	Red	Orange	Yellow	Green	Blue	Purple
9:00 SWITCH						
9:10 rotation 2	Purple	Red	Orange	Yellow	Green	Blue
9:40 SWITCH						
9:50 rotation3	Blue	Purple	Red	Orange	Yellow	Green
10:20 SWITCH						
10:30 rotation 4	Green	Blue	Purple	Red	Orange	Yellow

Figure 1. HiPSTIRs: The Intern Boot Camp 2013 Master Schedule.

Figure 2. Groups organized by shirt color.

100 The Use of 24-hour Return Visits To Assess Residents' Patient Centered Communication and Disposition Ability

Dieter M, Walsh B, Porter P, Walsh K/Morristown Medical Center, Morristown, NJ

Introduction: Patient Centered Communication (ICS1) and Disposition (PC7) are two of the milestones established by the ACGME and ABEM. These milestones can be difficult to assess because of variability in individual patient interactions. We sought to determine how assessing 24-hour return visits can make the evaluation of these milestones more objective.

Methods: Design and Setting: A retrospective review of patient visits over a six-month period in an academic emergency department with 85,000 visits per year.

Observations: The charts of all patients who returned within 24 hours of an initial visit were identified. Charts were sorted by the emergency medicine (EM) resident who initially evaluated the patient. Patients who were admitted on in the initial visit and those who left against medical advice were excluded. The percent of patients who return within 24 hours was calculated for each resident, as was the percent of patient who were admitted on the return visit. Charts were reviewed to assess ICS1 and PC7.

Results: Over the six month study period, there were 336 patients who were discharged from the ED and returned within 24 hours. Of these, 167 (50%) were seen by emergency medicine residents on the initial visit. The percentage of a resident's total patients that returned within 24 hours ranged from 0.4% to 1.4%, and the percentage of those patients admitted to the hospital on the return visit ranged from 11% to 100%. Review of individual patient charts reveals significant variability in the reasons patients return ranging from very thorough care to missed diagnoses.

Conclusion: Evaluation of 24-hour return visits provides an objective way to begin assessment ICS1 and PC7. The charts of patients who return provide insight into the appropriateness of the initial disposition, and the resident ability to provide anticipatory guidance and establish a follow-up plan. A simple review of statistics, however, is not a reliable for assessing residents-care.

101 Assessment of Prehospital Care with the Emergency Medicine Milestones

Styles C, Walsh B, Fiesseler F, Walsh K/Morristown Medical Center, Morristown, NJ

Introduction: The ACGME milestones do not address prehospital care specifically. This omission may have a negative impact on residents- learning and evaluation in this area, so some assessment is still needed to ensure competency. Advanced Life Support (ALS) patients receiving online medical control who are triaged by a physician to Basic Life Support (BLS) tend to be complex and are associated with increased liability. We sought to determine whether a review of these patients could provide a simple and efficient way to identify proficiency gaps in emergency medicine (EM) resident prehospital care.

Methods: Design and Setting: A retrospective review of prehospital ALS patients who were triaged to BLS by an EM resident physician over a one-year period.

Observations: The medical records of all ALS patients who, via online medical control, were triaged by an EM resident to receive only BLS prehospital care were reviewed. The percent of those patients who were admitted subsequently to a monitored bed in the hospital was calculated with a 95% confidence interval (CI). These were considered "inappropriate triages." Other charts were reviewed individually for the appropriateness of care.

Results: Out of 6,475 total ALS calls, 56 (0.9%; CI 0.6, 1.1) patients were triaged by EM residents to receive BLS prehospital care. Of those 56 patients, 27 (48%; CI 35, 61) were admitted to the hospital and 24 (43% (CI: 30, 56)) were considered "inappropriate triages" based on the fact that they were admitted to a monitored bed from the emergency department (ED). A chart review of the other 32 patients was easy and revealed no significant care deficiencies.

Conclusion: There are relatively few ALS patients who are triaged to BLS by EM residents. These patients tend to be complex and many are admitted to a monitored bed from the ED. The evaluation of only these patients seems to provide a simple and efficient way to assess EM resident proficiency in prehospital care.

Best of the Best Presentations

102 Evaluating the Implementation of an Interprofessional TeamSTEPPS Curriculum for Medical Students Using High Fidelity Simulation

Shah SH, Heitmann D, Mangolds V, Zgurzynski P, Bird SB/University of Massachusetts, Worcester, MA

Background: Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) is a validated framework to improve patient safety, however its impact in undergraduate medical education is understudied.

Objectives: We hypothesized that teaching TeamSTEPPS augmented with simulation will improve medical student views on teamwork and their measured performance in scenarios.

Methods: We performed a prospective evaluation of TeamSTEPPS using a pre- and post-intervention design. Participants were a convenience sample of 4th year medical students participating in a required course. Knowledge of teamwork and communication were assessed by TeamSTEPPS Learning Benchmarks (LB). Teamwork perception was assessed by TeamSTEPPS Teamwork Attitudes Questionnaire (T-TAQ). Students were divided into 6 teams to participate in a scripted pre-intervention simulated scenario involving physicians, nurses, pharmacists and respiratory therapy. Data on teamwork performance was obtained by using TeamSTEPPS Team Performance Observation Tool (T-TPOT). Then the standard TeamSTEPPS curriculum was delivered. The same teams engaged in a second, different post-intervention scenario. Post-intervention data were obtained by repeat completion of LB, T-TAQ and T-TPOT. Mean scores for the LB, T-TAQ, and T-POT from the two scenarios were compared using t-test.

Results: There were 23 participants. Mean scores for LB pre- and post- were 77% and 78%, respectively (p=ns). Mean pre- and post- scores on the T-TAQ were not statistically different (p=ns). For the T-POT, the mean score was 3.3 before and 3.6 after education (p=ns).

Conclusions: Implementation of the TeamSTEPPS curriculum failed to show an impact on medical student knowledge, attitudes or performance regarding teamwork. It is unclear if this is related to pre-existing familiarity with TeamSTEPPS concepts, the educational design of the curriculum may not meet the learner needs/expectations, or limitations of the survey instruments.

103 Development and Implementation of an Education Value Unit System (eVU) for Faculty Incentives

House JB, Carney M, Hopson LR, Nypaver M, Santen SA/University of Michigan, Ann Arbor, MI

Introduction/Background: Unlike patient care and research, educational activities are hard to quantitate. In an era of limited resources, recognition of educational contributions is essential to link funding with faculty efforts. Currently there is limited data and few models of an eVU system.

Table 1. An eVU model.

Departmental Activities – Baseline	Expected Minimums	Hours Logged
Leading a new educational sessions (including residency or fellowship lectures, administrative track or other departmental seminar, or intern orientation lecture(10 hours of time to account for preparation for each 1 hour presented) **Or** Preparing & leading an Active Learning sessions: (e.g Skills & procedure labs, simulation, oral board exams / Clinical skills exams cases, small group sessions, focused residency retreats, Peds OSCEs (5 hours credit : 1 hour presented)* **Or** Assisting with active learning sessions, small groups, skills labs, mentoring resident session, focused mentoring (2 hours credit : 1 hour presented) **Or** Student teaching sessions (1 hour credit : 1 hour presented) **Or** Other Teaching activities EMIG, Clinical Skills Assessments (CSA) (1 hour:1 hour)	10 hours/ year	
Didactic conference attendance* (1:1) optimal 3hrs/ month= 36	10 hours	
Completion of evaluations of residents & fellows (1 hour per month)	10 months/ year =10 hours	
Recruitment interviews for residency or fellowship programs (1 hour:1 hour)		
Additional Activities – resident mentoring, educational activities outside department, educational committees (maximum 10 hours)		
Total (minimum expected)	Total=30	

Educational Objectives: As part of an incentive plan for academic EM faculty, a taskforce representing education, research, and clinical missions was convened to develop a method of incentivizing productivity in all domains. A primary focus was educational metrics.

Curricular Design: Domains of educational contributions were defined based on the medical school's Funding Allocation Model. Each category was assigned a value based on time committed. Expected threshold for individual achievement was aligned with departmental goals and models created to test achievement of different benchmarks. Targets included increased completion of resident evaluations and attendance at resident conferences.

The final eVU model is show in Table 1. After review of several thresholds, consideration of priorities, and individual faculty impact, an annual benchmark of 30-hours of eVUs was set.

Impact/Effectiveness: In the 2012-2013 academic year, faculty eVUs ranged from 0 to 301.5 with a mean of 122.9 (std 194.5). Forty-five of 50 (90%) faculty members were met the 30-hour threshold based on current activities. Comparing faculty attendance at residency conference, from July 1 to October 31, pre- and post- eVU model implementation, faculty attendance increased from a mean of 5.3 hours in 2012 (pre) to 12.3 in 2013 (post) (t-test, p=0.0002).

In a busy academic department there are many work allocation pressures. Developing an eVU to recognize educational contributions and adding it to a bonus structure increases its importance. We propose an eVU model, which could be implemented and adjusted for differing departmental priorities, at other academic departments.

104 Milestones Residency Assessment Tracking (MRAT): A Cross-platform Mobile Web App for Bedside Evaluation of Residents Using Milestones

Grall KJ, Fiorello A, Griffith M, Meislin H/University of Arizona, Tucson, AZ

Introduction/Background: The ACGME initiated outcomes-based Milestones for resident assessment in anticipation of the NAS. These are progressive, competency-based, developmental outcome measurements. Best practices reveal optimal assessment and feedback of resident performance to be real-time and related to actual events. Thus we created an interactive web-based application that assesses real time resident performance of the EM Milestones.

Educational Objectives: Implement a web-based interactive application that incorporates the EM Milestones and provides instant feedback to residents. The application should satisfy the conditions of the ACGME and be web-based device accessible.

Curricular Design: From the bedside experience, we created Resident Experience Templates (RETs). RETs relate

to clinical experiences (i.e. Trauma Patient), procedures (i.e. Wound Management) while others are non-clinical (i.e. QA). These RETs then map back to 3-7 individual Milestones. The App allows a resident to initiate a RET evaluation process and choose an evaluator who instantly receives notification of a pending evaluation.

The application is interactive and provides the ability to evaluate bedside expertise as well as success in meeting the required Milestone. Real time evaluations allow for immediate feedback. Data is stored and can be used to document resident progress over time. The technology is intuitive, easy to use and time efficient and runs on multiple platforms and operating systems.

Impact/Effectiveness: Post Beta-testing, both residents and faculty reported satisfaction with ease of use and real-time feedback of actual patient care experiences. Initial beta-testing revealed several system issues that were corrected.

The MRAT system provides real-time Milestones tracking and immediate, Milestones-based feedback to residents on clinical experiences. It is based on experiential templates, thus this technology can be used by all specialties that have a Milestone evaluation requirement.

Educational Soundbites Presentations

105 Medico-legal Simulation: Using Simulation to Educate Medical Providers on the Anatomy of a Malpractice Case

Smith MD, Baskin BE, Emerman CL, Disilvio M, Groedel M, Noellet T/Case Western Reserve University, Cleveland, OH

Introduction: Medico-Legal simulation is not often explored by traditional simulation models; however it is beneficial in helping providers understand and experience the events surrounding a lawsuit and deposition. We describe the use of simulating a mock deposition.

Methods: Planning began between the simulation team, physicians to be deposed, and attorneys from a national law firm. The idea: present a mock deposition during a weekly EM educational conference. Two real cases (found in the defendant's favor) were used after de-identifying the cases for HIPAA compliancy. The actual physicians involved in these cases did not take part in the simulation. A senior resident and our department chairman volunteered to be prepped for deposition. Charts were created including records pertaining to the ED care at issue as well as prior visits, testing/EKGs, etc. Actual defense lawyers met with each of the two to-be-deposed physicians prior to the simulation to prep them for their testimonies. On the sim day, a panel of attorneys spent time discussing with our group of students, residents, and attendings the anatomy of a medical-civil lawsuit and a deposition. After this, the chairman and the senior resident were each deposed separately by different lawyers. The cases used involved a chest pain and headache complaint. AV equipment was used to record the depositions; and after each, the legal team reviewed highlights and key points, both negative and positive. This was followed with a question and answer session with the legal panel.

Reflection/Results: Feedback of the simulation was positive. Learners felt it helped reveal myths and fears of a legal suit; while educating on the many caveats and pit falls of a deposition. It also allowed observers to contrast the testimony of a new young senior EM resident versus that of a seasoned EM physician. Techniques and strategies of navigating and giving testimony in a suit and deposition were discussed by the attorneys.

106 A Multi-modal Curriculum for Emergency Medicine Residents to Maximize Value of Attendance at a National Conference

Blazejewski A, Rosen A, Golden D, Clark S/New York Presbyterian, New York, NY; Weill Cornell Medical College, New York, NY

Background: All Emergency Medicine (EM) residents are required to complete a scholarly project prior to graduation. To encourage scholarly activity, programs send residents to a national conference. We know of no formal curriculum that ensures residents maximize the value of this conference experience.

Objectives: We designed and implemented a multi-modal curriculum during a conference to augment conference programming. Our goals included: to help identify areas of interest, exposure to scholarly inquiry, and to encourage development of meaningful and feasible scholarly projects.

Curricular Design: Residents were required to attend 1-2 sessions daily pre-selected by the curricular design team due to relevance for resident research as well as attend at least two self-selected sessions per day. Two 75-minute daily debriefs were held after conference days. Sessions began with a brief presentation by a faculty member followed by small group discussions (led by a chief resident and an assistant program director) and finished with reportage. Day 1's presentation was "Research Experiences as a Resident: Identifying Opportunities" followed by small group discussions focused on "I Wish I Had Thought of That" (easy to conduct research with potentially high-impact results) and "Cool Idea but Could Have Been Done Better" (research on important issues in EM but with methodologic flaws). Day 2's presentation was "Pursuing Research Training to Enhance an EM Career" followed by small groups where individuals shared ideas and culminated with residents reporting on the project ideas of others to the larger group.

Impact: Post-session surveys found the curriculum to be effective in advancing scholarly projects and optimized attending the conference. Ninety-two percent felt the curriculum gave them new ideas for projects and improved existing plans for scholarly projects. Twenty-five percent felt the curriculum should be expanded in the future.

107 The Education Shift: A Novel Curriculum to Integrate Evidence-based Medicine into Bedside Practice for Senior Emergency Medicine Residents

Rosen T, Bhatt B, Hamburg L, Tichter AM, Clark S/New York Presbyterian Hospital, New York, NY; Columbia University College of Physicians and Surgeons, New York, NY; Weill Cornell Medical College, New York, NY

Background: Integration of evidence-based medicine (EBM) into daily practice in the Emergency Department is critical for patient-centered care and is included in the ACGME milestones. Successfully incorporating EBM at the bedside is challenging for emergency physicians due to inadequate training in the skill-set and perceived time-pressures during a clinical shift.

Educational Objectives: Our primary goals are to develop skills for finding, appraising, and applying evidence in real time to assist with patient care and to introduce residents to the peer-review process. We are building a searchable archive of appraised clinical questions and generating dialogue within the residency about the value of point-of-care EBM.

Curricular Design: We designed an 8-hour Education "E" Shift for 4th year Emergency Medicine residents once each month. The E-shift resident is a resource to those working clinically, using EBM to respond to at least 4 questions using the following steps: formulating a searchable question, identifying an article using EBM search resources, performing a structured critical appraisal of the article, and prepare a "clinical bottom line" summary applying the findings to the initial question. We developed a web interface with prompts assisting residents with each step. We added a peer-review process, in which each E-shift resident evaluates a response submitted by a colleague during a previous E-shift and selects one of their own responses for future peer-review. We publish each peer-reviewed response on our residency website. Every two weeks, we post a selected response on the "E-shift blog" for faculty and resident discussion.

Impact: Surveys suggest that E-shift has been successful, with 77% of participating residents reporting that it is educationally valuable and 66% that it has increased their ability to apply EBM to patient care. The E-shift blog has generated significant interest and dialogue within our residency.

CDEM Curricular Innovations Presentations

108 The Haunted ED: A Simulated Emergency Medicine Experience with a Halloween Twist

Gordon D/Duke University, Durham, NC

Background: Simulated patient encounters offer a dynamic and interactive teaching modality to engage learners. They can be used for formal instruction but also informally to generate excitement about emergency medicine. Halloween offers an opportunity to create a festive and theme-based simulation experience for learners.

Objectives:

1) To foster medical student interest in emergency medicine through a high-fidelity simulator and standardized patient activity embedded in a Halloween theme.

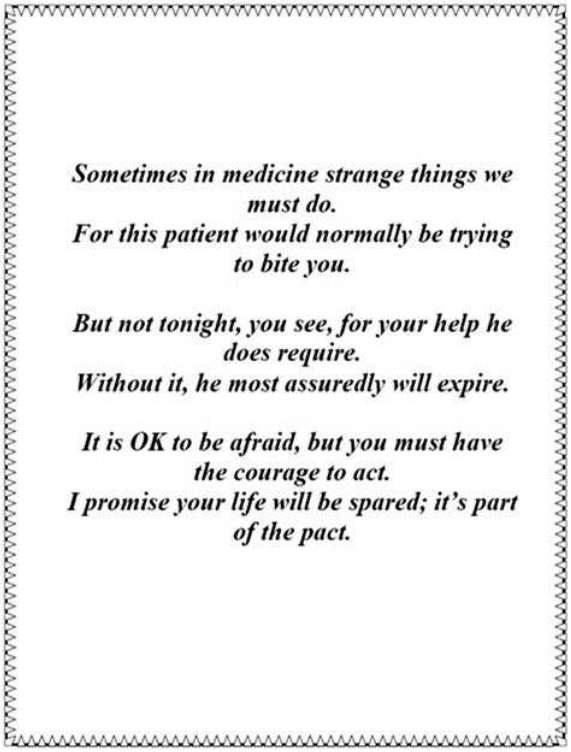
2) To expose students to select core content areas of emergency medicine.

Curricular design: Five scenarios were created with specific learning objectives spanning the topics of cardiac arrest, trauma, and toxicology. Each scenario featured a Halloween based narrative and character. For each station there was a patient- who could be a simulator, person in costume, or inanimate creature – and a guide to help students through the case. Students were introduced to each station through a doorway instruction sheet and then had 15 minutes to complete the encounter. Four emergency medicine faculty and four emergency medicine residents served as characters or guides. Twenty-three medical students from all years of training participated in the Haunted ED working in groups of two or three. The following day they were sent an online survey to provide feedback on their experience.

Name	Type	Topic	Narrative
The Undead	Simulator	V Fib Arrest	Students enter the room to find an unresponsive simulator dressed as a trick-or-treater who has been poisoned by bad candy. Upon initiating ACLS , the students will find the patient to be in PEA arrest. They should run or be guided through the differential diagnosis of PEA. They must treat for hyperkalemia to achieve return of spontaneous circulation.
Flesh Wound	Simulator	Penetrating chest trauma	Students enter the room to find a simulator dressed as a vampire who has been stabbed in the chest. They should be guided in conducting a primary trauma survey. Upon identifying the pneumothorax, they can practice chest tube placement on the simulator.
Twice Bitten	Standardized Patient	Black widow and copperhead envenomation	Students enter the room to find Frankenstein complaining of severe abdominal pain. They should perform a history and physical exam. A clue to the etiology of the abdominal pain is the sharp pain experienced in the upper back just prior to onset of pain while Frankenstein was standing in the dark corner of the dungeon. Time permitting, Frankenstein subsequently develops leg swelling and pain. He was unfortunately also bit by a snake while in the dungeon. Indications, risks, benefits, and costs of CroFab are discussed.
Witch's Brew	Standardized Patient	Toxic alcohol poisoning	Students enter the room to find a witch in distress after finding one of her flying monkeys difficult to arouse. In talking with the witch, they learn that she fears the monkey accidentally drank some of her potent and blue brew. After initial questioning, the students can be provided with lab tests revealing a profound anion gap acidosis from ethylene glycol poisoning. Treatment is discussed.
Strange Man	Standardized Patient	Carbon monoxide poisoning	Students enter the room to find an alien creature complaining of a severe headache. The room is dark because electrical power had been lost, and the spaceship is now operating off a back-up generator. As a clue to carbon monoxide poisoning, the alien notes that he feels fine when off the spaceship but in pain while on it. The students should be guided through the differential diagnosis of acute headache followed by the diagnosis and treatment of carbon monoxide poisoning.

Figure 1.

Impact/Effectiveness: Feedback from the students was uniformly positive with 83% of students (19/23) responding to the survey. Seventy-four percent of respondents identified the Haunted ED as one of the best learning activities they have participated in as a medical student. In terms of amount of perceived learning, 32% of students identified as having learned a great amount and 53% as learning an exceptional amount. All respondents stated the Haunted ED should be held again next year. The Haunted ED proved to be an enjoyable and high-yield activity to provide students with exposure to emergency medicine.



Doorway Instruction Sheet

Figure 2.

109 A Flipped Classroom Approach to an Emergency Medicine Clerkship

Jauregui J, Strote J, Shandro J/University of Washington Division of Emergency Medicine, Seattle, WA

Background: Educating medical students in emergency medicine concepts with limited time is challenging. Research has shown that engaging students in active learning during class time enhances outcomes, as students in a lecture setting have limited attention spans and information retention. We describe an educational innovation to flip the classroom by transforming the passive learning environment of a lecture-based curriculum to an active learning environment.

Educational Objective: Develop a meaningful learning environment by flipping the classroom through a combination of prerecorded online lectures and active learning during classroom time.

Curricular Design: After reviewing student feedback and the growing body of literature calling educators to rethink the classroom, directors of a fourth year emergency medicine clerkship developed a flipped classroom approach for allotted didactic time. Prior to this approach the clerkship curriculum consisted of a total of 12 hours of classroom time. To flip the classroom, lectures on key topics were taped and made available online for students to watch prior to class sessions. Time was consolidated to eight hours of faculty-facilitated active learning consisting of three hours of simulation, two hours of problem-based learning and three hours of skills labs. Curriculum success was measured through student evaluations.

Impact/Effectiveness: Data from student evaluations demonstrate that the flipped classroom approach enhanced the student educational experience. In the 8 months prior to the change, 46% of the "Areas for Improvement" comments were focused on lectures. In the ten months after the change, 20% of these comments were focused on lectures. "The series is very hands-on, and that is a great way to learn," and "I really enjoyed having online lectures – gave me the freedom to watch them when I had time" were common themes. In addition, faculty time was decreased by four hours per month.

Lightning Oral Presentations

110 The Right Stuff: Can Selection Criteria Predict Success in Emergency Medicine Residency Training?

Trail L, Hays J, Vohra T, Goyal N, Lewandowski C, Charlotte B, Krupp S/Wayne State University SOM, Detroit, MI; Henry Ford Health System, Detroit, MI

Background: The resident selection process involves consideration of multiple criteria to predict which applicants

will successfully complete residency and become competent physicians. Many studies have sought to determine which of these criteria predict success, with only limited data in the field of Emergency Medicine (EM).

Objectives: This study sought to identify medical student characteristics that predict success in and completion of an EM residency.

Methods: This was a retrospective review of medical student and resident data from a large academic 3-year EM residency.

Subjects: All EM residents who matched between the years 2004-2013.

Observations: A single reviewer reviewed ERAS applications to extract 19 variables from each application. This same individual interviewed 16 faculty and asked them to assign each resident an overall assessment score – from 1 (best) to 3 (worst) as well as a ranking of each individual from 1 (best) to number of residents in their graduating class (worst). Simple linear regression models were used to determine which variables predicted higher rankings by the faculty. Wilcoxon Rank Sum and Fisher's Exact tests were used to compare residents who did not complete the program.

Results: A total of 152 residents met our study criteria; 25 were excluded due to incomplete data available, leaving a total of 127 subjects. Total application score, Step 2 CK score, AOA status, outstanding Dean's letter and medicine clerkship grade were significant ($p<0.05$) predictors of overall assessment and class rank in univariate models. Mean interview score ($p=0.003$) and basic science scores ($p=0.04$) were predictors of overall

Table 1. Selection Criteria.

Variable	Level	n	Mean ± SD (min,max) or n (%)
Total Sheet Score (Percentile)		124	63.7 ± 9.0 (40.6, 90.0)
Mean Interview Score		122	19.6 ± 2.4 (13.0, 25.0)
Mean Letter of Recommendation		119	3.8 ± 0.5 (2.5, 5.0)
AOA	1	127	11 (8.7%)
	0		116 (91.3%)
Step 1 Score	Above Mean	126	64 (50.8%)
	Below Mean		62 (49.2%)
Step 2 Score	Above Mean	111	75 (67.6%)
	Below Mean		36 (32.4%)
Medical School Rank	Foreign/ Unknown/ Osteopathic	124	19 (15.3%)
	Low Reputation		8 (6.5%)
	Fair Reputation		22 (17.7%)
	Good Reputation		70 (56.5%)
	Outstanding Reputation		5 (4.0%)

Table 1. Continued.

Variable	Level	n	Mean ± SD (min,max) or n (%)
Basic Science	Any marginal or failing grades	124	10 (8.1%)
	All pass grades		30 (24.2%)
	Mix of pass, high pass, and rare honors		59 (47.6%)
	Mostly high pass and honors		18 (14.5%)
	Mostly honors, AOA		7 (5.7%)
Overall Performance Clerkships	Any marginal or failing grades	124	8 (6.5%)
	All pass grades		14 (11.3%)
	Mix of pass, high pass, and rare honors		62 (50.0%)
	Mostly high pass and honors		36 (29.0%)
	Mostly honors, AOA		4 (3.2%)
EM Clerkship	Fail	115	0
	Pass		15 (13.0%)
	High Pass		52 (45.2%)
	Honors		48 (41.7%)
Med Clerkship	Fail	117	1 (0.9%)
	Pass		50 (42.7%)
	High Pass		43 (36.8%)
	Honors		23 (19.7%)
Surgery Clerkship	Fail	118	3 (2.5%)
	Pass		53 (44.9%)
	High Pass		40 (33.9%)
	Honors		22 (18.6%)
Exemplary Characteristics	Yes	127	28 (22.1%)
	No		99 (78.9%)
Dean's Letter	Concerns Raised, lower 10%	124	0
	Good Candidate, lower 1/3		26 (21.0%)
	Very Good Candidate, middle 1/3		50 (40.3%)
	Excellent Candidate, upper 1/3		35 (28.2%)
	Outstanding Candidate, AOA top 10%		13 (10.5%)
Research/ Leadership Roles	No research background; or no known leadership roles	124	5 (4.0%)
	2		41 (33.1%)
	Some research background and at least 1 publication; or some leadership roles		59 (47.6%)
	4		16 (12.9%)
	Strong background with publications; or many leadership roles in diverse endeavors		3 (2.4%)
Personal Statement	Poorly Written, questions are raised concerning intent	124	23 (18.6%)
	Adequate or typical statement		92 (74.2%)
	Clear, well-written, impressive		9 (7.3%)

assessment alone in univariate models. No variables predicted failure to complete residency (n=6).

Conclusions: Some applicant variables may show predictive value of resident clinical competency as measured by faculty assessment. The limitations of this study include its sample size and retrospective nature.

Table 2: Simple Linear Regression Univariate Models.

Variable	Level	Overall Assessment (p-value)	Class Rank (p-value)
Total Sheet Score (percentile)	--	0.0106*	0.0037*
Mean Interview Score	--	0.0029*	0.0812
Mean Letters of Recommendation	--	0.2989	0.1462
Step 1 Score	Above Average	0.5014	0.6953
Step 2 Score	Above Average	0.0246*	0.0181*
AOA	In AOA	0.0038*	0.0010*
Exemplary Characteristics	Yes	0.1213	0.3479
Medical School Rank (baseline Outstanding Reputation)	Foreign/Unknown/ Osteopath	0.8267	0.9096
	Low Reputation	0.7748	0.8265
	Fair Reputation	0.8775	0.6583
	Good Reputation	0.6865	0.8290
Basic Science (baseline 'All Pass Grades')	Any marginal or failing grades	0.8073	0.4789
	Mix of pass, high pass, and rare honors	0.3615	0.8952
	Mostly high pass and honors	0.3862	0.2888
	Mostly honors, AOA	0.0402*	0.1144
Overall Performance Clerkship (baseline 'All Pass Grades')	Any marginal or failing grades	0.7278	0.5078
	Mix of pass, high pass, and rare honors	0.4978	0.5079
	Mostly high pass and honors	0.3658	0.3993
	Mostly honors, AOA	0.0835	0.0535
Dean's Letter (baseline 'Very Good Candidate (middle 1/3)')	Good Candidate, lower 1/3	0.8022	0.8716
	Excellent Candidate, upper 1/3	0.6319	0.9046
	Outstanding Candidate, AOA top 10%	0.0191*	0.0393*
Research/ Leadership Roles (Baseline 'Some research background and at least 1 publication; or some leadership roles')	No research background; or no known leadership roles	0.9106	0.9782
	2	0.7743	0.3822
	4	0.6937	0.8183
	Strong background with publications; or many leadership roles in diverse endeavors	0.6537	0.8028
Personal Statement (Baseline 'Adequate or typical statement')	Poorly Written, questions are raised concerning intent	0.5538	0.6957
	Clear, well-written, impressive	0.9706	0.7735
Med Clerkship (Baseline Honors)	Fail or Pass	<0.0001*	0.0003*
	High Pass	0.2908	0.2425
EM Clerkship (Baseline Honors)	Pass	0.7975	0.7504
	High Pass	0.8152	0.4318
Surg Clerkship (Baseline Honors)	Fail or Pass	-0.20	0.9660

111 Does Formalized Scoring and Feedback Improve Resident Documentation Skills?

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Background: Proper documentation is an important skill. A prior study showed 47% of residents felt they had adequate training on this topic while 95% of attendings identified charting as an important skill.

Objectives: To determine if performing an intervention consisting of a lecture, chart review using a novel scoring tool, and individual feedback would improve residents' charting.

Methods: A tool was developed to quantify a chart on its completeness with emphasis on medical decision making. All PGY 2 and 3 EM residents participated in the study.

Baseline scores were calculated without the intervention using charts from the second year of training for the current PGY 3 residents. Charts from that year were scored at a 6 month interval to determine if a resident's charting improved solely due to residency progression.

Scoring process: 3 pre-intervention charts were randomly selected. Residents either had 2 admission and 1 discharge chart reviewed or vise versa.

A chart for review consisted of physician and nursing notes as well as vital signs. Charts were given to 2 staff physicians who used the tool to score the charts. These charts

were then given to 4 staff physicians who met with residents to discuss the results.

During the intervention period all residents attended a lecture to review the tool. A charting tip sheet was also placed in the ED. Periodic email reminders of the charting tool and tips were sent to all residents.

After the six month intervention period, the scoring process was repeated.

Results: Pre-intervention baseline scores were not significantly different at time 0 and 6 months (64.3 versus 64.4, p=0.96). All residents, PGY 2, and PGY 3 residents improved their scores between 0 and t+6 months, though the differences were not significant (p=0.06).

Conclusions: A brief intervention incorporating personalized feedback improved resident performance on a chart scoring tool. Further study with a large cohort may be beneficial.

Table 1. Comparing % correct charting for pre and post measurements.

Group	Pre		Post		p-value
	Mean	S.D.	Mean	S.D.	
All residents (n=27)	69.9	7.9	73.1	7.4	0.06
Second year residents (n=14)	73.2	7.8	75.1	8.2	0.358
Third year residents (n=13)	66.4	6.9	70.8	6.1	0.104

HPI
Is the HPI complete and comprehensive enough to adequately determine what the chief complaint is, how long that complaint has been present, exactly where physically it is on the body, and any associated symptoms? Does the HPI contain pertinent information that is complaint specific such as previous intubations and admission for asthma or radiation of pain and exacerbating factors for chest pain (5 points)?
1 point for a clear description of the actual chief complaint
1 point for a delineation of how long the CC has been present
1 point for either the severity of the symptoms/complaint or exacerbating/remitting factors
1 point for pertinent components of the PMHx as they relate to the CC (i.e. previous stents in a patient with chest pain, previous intubations in an asthma pt etc.)
1 point for previous treatment or previous evaluation/diagnosis of similar symptoms (i.e. a patient with abdominal pain has had the same symptoms in the past and was diagnosed with pancreatitis etc.)
Add points together for total on this section.

ROS
Are an "appropriate*" review of systems included either in the HPI or in a standalone ROS section (2 points)?
* An "appropriate" ROS depends on acuity and chief complaint. ROS for abdominal pain should touch on bowel movements, fever, vomiting, nausea, etc. For an ankle sprain, as long as the HPI makes it clear the fall was mechanical in nature, an expansive ROS is not needed.
2 points for a full ROS as described above. 1 point for a semi-complete ROS that contains only the systems that are obviously connected with the CC (i.e. for abdominal pain including nausea and vomiting, diarrhea etc. but not including fever, shortness of breath, dysuria, etc. that may be integral in a full and complete ROS/HPI).
….Truncated to fit character requirements

Figure 1. Emergency Medicine Chart Review Tool.

112 Evaluation of How Emergency Medicine Resident Engagement and Satisfaction are Affected by use of an Audience Response System

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Background: In an era of ubiquitious cell phones, laptops and tablet computers, residents appear to have difficulty maintaining focus during lectures. Electronic audience response systems (ARS) allow presenters to query the audience using a electronic keypads. These devices are commonly touted as increasing audience engagement. A literature search revealed no prior evaluations of the use of these devices in the GME environment.

Objectives: Our hypothesis was that use of an ARS would improve help improve resident focus and that residents would be satisfied with this tool.

Methods: A pre and post survey was given to residents during regularly scheduled didactics at our 36 resident PGY 1-3 EM 36 resident EM program. Surveys were given approximately one year apart, during which time an ARS (Turning Technologies) was used for at least one large group lecture a month. All EM residents in our program present on the survey days were included. Likert-type surveys scale with values ranging from 1-5 asked questions about attention, difficulty in following along in lectures as well as a post test question on general satisfaction with the ARS. Median values and the results were compared using the Wilcoxon signed-rank test.

Results: 24 out of 36 of residents participated. There was a significant increase in residents' ability to give their complete attention (median increase of 0.87 overall, $p<0.05$) and follow the material being presented in lectures (median increase of 0.67 overall, $p<0.05$), with an 85% overall satisfaction rate with the use of the ARS, with 42.9% "very or extremely" satisfied in the post survey.

Conclusions: An ARS appears to be useful modality to increase resident focus during lectures presented and improves their perceived ability to follow along with the presenter. Residents were very satisfied with the ARS as an educational tool.

113 Intern Boot Camp Increases Self-assessment on Six EM Milestones

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Background: In the Next Accreditation System residents will be evaluated according to specialty-specific milestones (MS). There is limited data regarding the reliability and validity of the MS as an assessment tool. Whether or not levels 1-5 represent meaningful changes in resident development remains unclear.

Objectives: The purpose of this study is to measure the impact of an Intern Boot Camp (IBC) on self-assessment of EM MS. We hypothesize that our 1-day IBC will produce significant increases in self-assessment.

Methods: This is an IRB approved, prospective observational study. The UCSF Fresno Medical Education Program has 85 interns entering 9 different specialties. The primary educational site is Community Regional Medical Center, a Level 1 Trauma Center. All new interns are invited to participate in the IBC during orientation. Interdisciplinary groups rotate through 50-minute stations on the following topics: 1) suturing, 2) airway management, 3) transitions of care, 4) pediatric resuscitation, 5) aseptic technique and informed consent, 6) central line placement, 7) surviving night-float, and 8) emergency stabilization. Interns self-rated before and after the IBC held on June 21,2013, on 6 milestones addressed in the curriculum (1, 9, 10, 13, 14, and 21). Data was analyzed using means, paired t-tests and p-values. The only exclusion criterion was nonparticipation.

Results: Eighty-two interns attended the IBC. Five interns did not complete both steps of the survey and were excluded from analysis. On average, considering the 6 MS addressed during the IBC, interns rated themselves 3.10 on a 10-point scale, corresponding to a Level 2, before IBC and 4.45 afterwards, corresponding to a level 3. See Table 1 for detailed results.

Conclusions: Not only did interns self-rate on EM MS at a level well above their expected competency, we found our 1-day IBC to significantly increase self-assessment to a level expected of EM trainees mid-residency.

Table 1. Impact of an IBC on self-assessment of 6 EM MS using a 10-point scale.

MS	Mean Pre-IBC	Mean Post-IBC	Mean Change	p-value
1	3.94	5.23	1.28	<0.001
9	3.14	4.49	1.29	<0.001
10	2.73	4.36	1.57	<0.001
13	2.6	3.91	1.25	<0.001
14	1.93	3.73	1.74	<0.001
21	4.25	4.95	0.65	<0.01