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The Council of Residency Directors in Emergency Medicine 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 2020. 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 of Directors for helping to make this collaborative special issue possible. CORD abstracts are archived at http://westjem.com/cord-abstracts and http://escholarship.org/uc/uciem_westjem.

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Research Abstracts

1 "DC HOME:" A Standardized Communication Tool Used During Discharge Improves Resident Performance

Baca M, Raza C, Boge L, Edwards D, Cubeddu L, Goldszer R, Farcy D, Dalley M / Mount Sinai Medical Center

Background: The discharge conversation is a critical component of the Emergency Department encounter. Studies suggest that Emergency Medicine residency education is deficient in formally training and assessing residents on the patient discharge discussion.

Objectives: To assess the proficiency of Emergency Medicine residents in addressing essential elements of a comprehensive discharge conversation, to identify which components of the discharge conversation are repeatedly omitted, to introduce "DC HOME," a standardized discharge mnemonic, and to determine if its implementation improves resident performance.

Methods: This is a prospective observational pre and post intervention study done by convenience sampling of 400 resident discharge encounters. Resident physicians were observed by attending physicians who completed an evaluation, answering "Yes" or "No" as to whether residents addressed 6 different components of a comprehensive discharge. The 6 components included diagnosis, care rendered, health and lifestyle modifications, obstacles after discharge, medications and expectations or "DC HOME". A 30-minute lecture introducing the mnemonic "DC HOME" was provided to resident physicians. Differences between pre-intervention and post-intervention were recorded.

Results: Resident physicians improved significantly in all 6 components of "DC HOME" from pre-and-post intervention: discharge diagnosis ($p=0.0036$) and the remaining 5 components ($p<0.0001$). There was a statistically significant improvement in patients' perception for health and lifestyle modifications, obstacles after discharge, medications and expectations after discharge ($p<0.0001$) and discharge diagnosis ($p=0.0029$).

Conclusion: Emergency Medicine residents frequently fail to address key components of the discharge conversation. The implementation of the "DC HOME" discharge mnemonic improves resident discharge performance.

2 A Comparison of Standardized Letters of Evaluation for Emergency Medicine Residency Applicants

Wilson D, Chandra S, Laoteppitaks C / Sidney Kimmel Medical College at Thomas Jefferson University

Background: Medical students pursuing an EM residency are advised to obtain at least two Standardized Letters of Evaluation (SLOE). Students often complete one rotation at their home institution and at least one "away" rotation at a program separate from their home institution. The SLOE was introduced as an objective tool. There is a sparsity of literature comparing SLOEs of home and away rotations. Program directors value away SLOEs more highly than home SLOEs. A recent study determined students performed better on home rotations with respect to global assessment and rank list placement, but did not look at all parts of the SLOE.

Objective: The aim of this study was to determine if there is a difference in scores between home rotation and away rotation SLOEs.

Methods: The authors retrospectively reviewed applications of all applicants to an urban, academic EM residency program. For each SLOE, the authors calculated a composite score from rankings in seven skill categories, and converted global assessment and rank list position to percentile scores. The composite score, global assessment, and rank list position on the home rotation SLOE were compared to those of the away SLOE using a paired t-test for each student. Average scores were calculated and compared for students with more than one home SLOE or more than one away SLOE.

Results: An evaluation of 721 applicants with at least one home SLOE and one away SLOE demonstrated a significant increase in the estimated rank list placement of home rotators ($p=0.003$). The data failed to demonstrate a statistically significant difference in a composite score of the seven skill categories ($p=0.69$), or the global assessment ($p=0.97$).

Conclusion: Our study concluded that the only difference in SLOEs is that students are likely to be given a slightly higher estimated placement on the rank order list on a home SLOE. We hope this will help residency leadership with reviewing applications.

3 A Nationwide Survey of Program Directors on Resident Attrition in Emergency Medicine

Mittelman A, Palmer M, Dugas J, McCabe K, Spector J, Sheng A / Boston Medical Center

Background: Despite the burdens that resident attrition places upon programs, fellow trainees, and patients, little is known about attrition in EM. We aim to conduct the first national survey of EM program directors (PDs) to characterize reasons behind and risk factors for resident attrition in EM.

Objectives: The first nationwide survey of EM program directors showed that resident attrition is a complex and multifactorial entity. This survey study serves as the starting point for understanding attrition in EM. Our primary objectives are to quantify resident attrition in EM training programs and the reasons behind it from a PD perspective. Our secondary objectives are to describe demographic characteristics of residents undergoing attrition, personal factors associated with attrition, and the avenues of resident replacement.

Methods: We conducted a national survey study of all EM PDs during the 2018-2019 interview season. PDs were asked to identify all residents who left their program prior to completion within the last four academic years (2015-2016 to 2018-2019), provide relevant demographic information, and select perceived reasons for attrition. Frequencies, percentages, proportions, and 95% confidence intervals were obtained for relevant program- and resident-specific demographics. Fisher's Exact tests were performed to compare reasons for attrition between age groups.

Results: A total of 118 of 217 PDs who received our recruitment email completed the questionnaire (response rate of 54%). During the four-year study period, 39 of the 118 programs (33%) experienced at least one resident attrition. A total of 52 residents underwent attrition. Residents undergoing attrition were more likely to be early in training. Gender was not associated with attrition. Older residents were more likely to leave due to perceived academic challenges. The most common perceived reason for attrition was to switch specialties. Resident replacement was successful in 42% of cases.

Conclusions: Nearly one-third of residencies were affected by resident attrition. Although arguably predictive of attrition in other fields, gender was not associated with attrition in our sample.

Table 1. Characteristics of residents undergoing attrition (n=52).

		n	%
PGY* status in 2018-2019			
	PGY-1	10	19.23
	PGY-2	15	28.85
	PGY-3	19	36.54
	PGY-4	8	15.38
Completed years at your program			
	Less than 1 year	13	25.00
	1 year	32	61.54
	2 years	7	13.46
Gender			
	Male	36	69.23
	Female	16	30.77
Estimated age			
	<26	6	11.54
	26-30	28	53.85
	31-35	9	17.31
	36-40	6	11.54
	>40	3	5.77
Under-represented minority in medicine			
	Yes	9	17.31
	No	42	80.77
	Unsure	1	1.92
Marriage status			
	Married	21	40.38
	Unmarried	27	51.92
	Unsure	4	7.69
Children before starting residency			
	Yes	10	19.23
	No	38	73.08
	Unsure	3	5.77
	Missing	1	1.92
New child or became pregnant during residency			
	Yes	6	11.54
	No	42	80.77
	Unsure	3	5.77
	Missing	1	1.92
Medical school education			
	MD** from US/Canada allopathic medical school	36	69.23
	DO*** from US/Canada osteopathic medical school	15	28.85
	International medical graduate	1	1.92
Trained in part or completed residency in another specialty before applying to EM**			
	Yes	6	11.54
	No	45	86.54
	Missing	1	1.92
Final rank list position			
	Top 10%	5	9.62
	Top 1/3	16	30.77
	Middle 1/3	19	36.54
	Lower 1/3	4	7.69
	Unknown	8	15.38
Ties to geographic area			
	Grew up in the area	6	11.54
	College/medical school, worked in area	7	13.46
	Has family living in area	3	5.77
	No ties to the area	29	55.77
	Unknown	6	11.54
	Missing	1	1.92

*PGY = Post-Graduate Year
**MD = Doctor of Medicine
***DO = Doctor of Osteopathic Medicine
****EM = Emergency Medicine

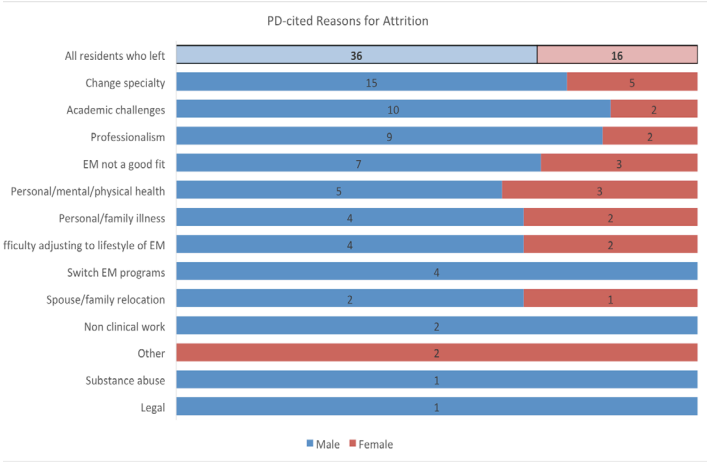


Figure 1. Perceived reasons for attrition, by gender.

4 A Novel and Well-Received Way to Track Resident Procedures

Walsh B, Fiesseler F, Biggs D / Atlantic Health Systems - Morristown Medical Center

Background: Tracking of ACGME-required procedure is fraught with issues. Resident progress was often only analyzed during semi-annually evaluations and residents had a propensity to fall behind. Objective: We sought to create a better way to track residents' procedures in order to ensure they were keeping up-to-date. We then assessed whether the residents found it beneficial and motivating and whether they were offended by others seeing their progress.

Objective: To evaluate a novel way to track residents' progress in documenting procedures

Methods: A spreadsheet was developed in Google Sheets. It contains the names of all the residents, the 15 required

procedures, and the minimum threshold for competence of each. The expected number of procedures for each resident for that time in their training was calculated. We termed the expected number the "PACE Score." Residents received the entire programs' PACE scores monthly. For two years, residents were surveyed about the PACE Score using an online questionnaire with a 5-point Likert scale (1=bad to 5=good). Average ratings and differences (D) were calculated with 95% confidence intervals (CI).

Results: 45 residents (15 in each PGY) completed the PACE score survey. Overall, the residents found it moderately beneficial (average 3.4, CI: 3,1,3.7) and moderately motivating (average 3.3, CI: 3.0, 3.7), while not being offensive (average 3.9, CI: 3.6, 4.2). PGY-3s found the PACE score significantly more beneficial than PGY-1s (4.1 vs 3.3, D 0.8, CI: 0.1, 1.5) and PGY-2s (4.1 vs. 2.9, D 1.2, CI: 0.4, 2.0). PGY-3s also found the PACE Score more motivating than PGY-1s (4.0 vs. 3.2, D 0.8, CI: 0.5, 1.5) and PGY-2s (4.0, 2.8, D 1.2, CI: 0.5, 1.9). While no PGY level was offended by sharing the PACE scores (range 3.5-4.5), PGY-3s found it significantly less offensive than PGY-1s (4.5 vs 3.5, D 0.9, CI: 0.2, 1.6).

Conclusion: Overall, residents are very satisfied with the PACE score. The residents found the PACE score beneficial, motivating, and not offensive. PGY3 residents were particularly happy with process.

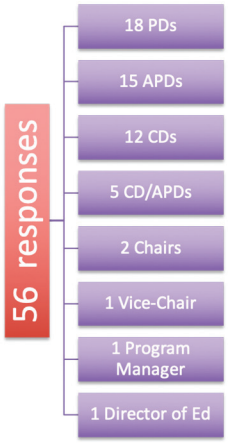


Image 1.

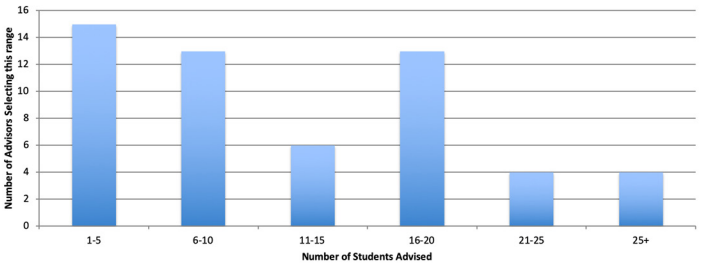


Image 2. Number of Students Advised.

5 A Wide Range of Sizes: Advisors' Approaches to Standardized Video Interview Preparation

Olaf M, moffett s, Smith L, Fix M, Ledford M / Geisinger Commonwealth School of Medicine; Rutgers New Jersey Medical School; Baystate Medical Center; University of Utah Health Sciences Center; University of Connecticut

Background: The Standardized Video Interview (SVI) was introduced by the AAMC and piloted by Emergency Medicine Residency programs. As a novel residency application component, we suspected advisors' recommended methods and resources for student preparation might vary and sought to identify those practices. The recently announced withdrawal of support by our specialty for participation in the SVI may be interpreted in the context of these data.

Objectives: At the conclusion of this activity, the learner will have an increased understanding and demonstrate insight into the practices used within the CORD community to advise students on preparation for the Standardized Video Interview, and evaluate potential impact on medical students. We sought to gain insight into SVI preparation methods

Methods: After IRB approval, we surveyed emergency medicine educators through the CORD listserve with 56 programs responding. Incomplete responses were excluded from the data analysis.

Results: The 56 respondents comprised mainly of PDs, APDs and CDs (Image 1). The number of students advised varied greatly (Image 2). Advice was commonly generated from personal experience and interpretation of national organization guidelines. An assortment of resources were allocated to the effort, represented by responses as varied as "none--advise students not to worry about it," to two advisors who reported using a commercial interview-prep service. It was common for applicants to be offered space (23/56, 41%) or technical support (27/56, 48%). The time committed to student advising ranged from zero to 20 hours. Associated costs attributed to preparation varied, including faculty time and/or resources, with values estimated to be up to $10,000. Most (31/56, 55%) advisors felt that time spent preparing students for the SVI was just right, with the second-most common response (15/56, 27%) being "not sure."

Conclusions: For this novel, un-tested, and high stakes assessment, the number and types of resources and costs used for preparation varied greatly. The heterogeneity of responses may, although our survey did not directly address this, have been associated with a lack of clarity on the goals, assessment rubric and attributes assessed by the SVI.

6 Acute Stress Among Emergency Medicine Residents Working in the Emergency Department

Janicki A, Frisch A, Frisch S, Patterson P, Brown A / University of Pittsburgh School of Medicine, Department of Emergency Medicine; University of Pittsburgh School of Nursing

Background: Exposure to stress can affect performance in many ways. It may impair cognitive performance and the ability to multitask, both vital in Emergency Medicine. It has been demonstrated that board certified EM physicians experience physiologic stress while working clinically, but it is unclear if residents experience a similar acute stress response working in the ED.

Objective: We sought to determine if EM residents experience acute physiologic and subjective stress while working clinically in the Emergency Department in order to identify resident, patient, and shift characteristics contributing to the acute stress response and elicit targeted educational interventions. We hypothesized that residents experience acute subjective and physiologic stress while working clinically.

Methods: We performed a prospective observational study evaluating surrogate markers of physiologic stress including heart rate (HR) and heart rate variability (HRV) and subjective stress levels in EM residents during clinical shifts. HR and HRV were measured via a 3-lead Holter monitor worn during clinical shifts and compared to baseline data obtained during educational didactic sessions. Subjective stress was evaluated through a survey completed before and after clinical shifts.

Results: Twenty-one residents were enrolled and data acquired from 40 shifts. Median age was 28. There were 6 PGY-1, 8 PGY-2, and 7 PGY-3 participants. Residents experienced an increase in subjective stress ($p<0.001$), mean heart rate ($p<0.001$), maximum heart rate ($p<0.001$), and decrease in HRV ($p=0.005$) while working clinically. HRV was inversely correlated with subjective stress levels, but this did not reach statistical significance ($p=0.09$).

Conclusions: EM residents experience acute subjective stress and physiologic changes associated with acute stress while working in the ED. Reported stress appears to correlate with HRV indicating a direct relationship between acute subjective and physiologic stress, but this did not reach statistical significance. These findings should be studied in a larger, more diverse cohort and efforts made to identify resident, patient, and shift characteristics that contribute to the acute stress response to elicit targeted educational interventions.

Table 1. Participant demographics assessment (n=21).

Age, median (interquartile range)	28 (27-28)
Gender, n (%)	
Male	17 (81)
Female	4 (19)
Relationship Status, n (%)	
Single	9 (43)
Married/Civil Partnership	12 (57)
Race, n (%)	
White	20 (95)
Black	1 (5)
Postgraduate Year level, n (%)	
PGY-1	6 (29)
PGY-2	8 (38)
PGY-3	7 (33)
Resident experience level, days, mean (SD)	463.7 (279.2)

Table 2. Physiologic and subjective parameters.

	Baseline	During clinical work	P-value
Heart rate, bpm[a], mean (95% CI)	70 (77.8-73.2)	78 (74.7-81.7)	$p < 0.001$
Maximum heart rate, bpm[a], mean (95% CI)	83 (78.4-86.7)	109 (103.6 – 113.8)	$p < 0.001$
Heart rate variability			
SDNN[b], msec, mean (95% CI)	262.8 (230.8-294.7)	208.9 (184.9-232.8)	$p = 0.005$
	Pre-Shift	**Post-Shift**	**P-value**
Subjective stress score, range 1-7, mean (95% CI)	2.4 (2.1-2.7)	3.9 (3.5-4.3)	$p < 0.001$
PGY 1	2.7 (2.4-3.0)	4.9 (4.5-5.3)	
PGY 2	2.6 (2.0-3.3)	3.8 (3.1-4.6)	$p = 0.01$[c]
PGY 3	1.9 (1.5-2.4)	3.2 (2.4-4.0)	

[a]beats per minute; [b]standard deviation of all normal RR intervals; [c]PGY levels compared using analysis of variance.

7 An Approach for Leveraging Patients' Feedback in Emergency Medicine Training

Mozayan C, Gisondi M, Kline M, Manella H, Chimelski E, Alvarez A, Sebok-Syer S / Stanford Emergency Medicine Residency; Northwestern University

Background: The advancement of competency-based medical education has demanded more assessment data regarding residents' clinical performance. Given residents spend a significant amount of their time with patients, patients may be ideally suited to provide feedback on resident communication. In this study, we explored whether patients could provide residents with feedback on their communication skills.

Objective: To understand patients' experiences in the ED and evaluate the scope and quality of the feedback they are able to provide to emergency medicine residents.

Methods: Adult patients pending discharge from the ED were interviewed in-person by trained individuals over a 5 month (12/2018-4/2019) period using the Communication Assessment Tool. This tool contained 13 Likert scale

questions and 3 open ended questions. A content analysis of patients' responses to the open ended questions was done by 3 researchers using a modified version of the Completed Clinical Evaluation Report Rating (CCERR) tool.

Results: We collected data from 42 patients and received 32 narrative comments for 20 of our 46 residents. In general, patients responded very positively, with 551/588 (94%) reporting in the highest category of "Very Good." Analysis of the narrative comments using the CCERR demonstrated that patients can articulate quality aspects of their care, and that their comments were generally supportive. Furthermore, they are able to offer at least somewhat specific examples of things residents did well (81%). We found that patients were less likely to comment on things the resident did poorly or provide recommendations for improvement.

Conclusion: This study advances our understanding of the value and scope of feedback that patients can provide residents regarding communication. Our findings have implications for the use of patients as an untapped resource in terms of gathering more assessment data about resident clinical performance. Motivating patients to elaborate on residents' positive traits and describe what they did well may be the best avenue to maximize the yield from patient feedback.

Table 1. Modified CAT Questionnaire.

"How well did the resident physician..."	Very Poor	Poor	Fair	Good	Very Good	N/A
Greet you in a way that made you feel comfortable?	0(0)	0(0)	0(0)	2(5)	40(95)	0(0)
Treat you with respect?	0(0)	0(0)	0(0)	2(5)	40(95)	0(0)
Show interest in your ideas about your health?	0(0)	0(0)	0(0)	2(5)	40(95)	0(0)
Understand your main health concerns?	0(0)	0(0)	1(2)	0(0)	41(98)	0(0)
Pay attention to you (look at you, listen carefully)	0(0)	0(0)	1(1)	2(4)	39(93)	0(0)
Let you talk without interruptions?	0(0)	0(0)	1(2)	2(5)	39(93)	0(0)
Give you as much information as you wanted?	0(0)	0(0)	0(0)	3(7)	39(93)	0(0)
Talk in terms you could understand?	0(0)	0(0)	0(0)	2(5)	40(95)	0(0)
Check to be sure you understood everything?	0(0)	0(0)	3(7)	2(5)	36(86)	1(2)
Encourage you to ask questions?	0(0)	0(0)	1(2)	2(5)	38(93)	1(2)
Involve you in decisions as much as you wanted?	0(0)	0(0)	0(0)	1(2)	40(95)	1(2)
Discuss next steps, follow-up plans.	0(0)	0(0)	0(0)	1(2)	41(98)	0(0)
Show care and concern.	0(0)	0(0)	0(0)	3(7)	38(90)	1(2)
Spend the right amount of time with you.	0(0)	1(2)	0(0)	1(2)	39(93)	1(2)

Data are reported as n(%).

Table 2. Modified Completed Clinical Evaluation Report Rating (CCERR) Tool.

	Not at All	Somewhat	Good	Very Good	Excellent
Comments are balanced providing both strengths and areas for improvement.	28(88)	2(6)	2(6)	0(0)	0(0)
Comments justify the ratings provided.	5(16)	17(53)	10(31)	0(0)	0(0)
Clearly explained examples of strengths using specific descriptions are provided in the comments.	6(19)	23(72)	3(9)	0(0)	0(0)
Clearly explained examples of weaknesses using specific descriptions are provided in the comments.	27(84)	5(16)	0(0)	0(0)	0(0)
Concrete recommendations for the trainee to attain a higher level of performance are provided.	29(91)	3(9)	0(1)	0(0)	0(0)
Comments are provided in a supportive manner.	4(13)	4(13)	21(65)	3(9)	0(0)

Data are reported as n(%).

8 An Exploration of the Barriers To Workplace Lactation in Emergency Medicine

Moulton K, Sebok-Syer S / Stanford Emergency Medicine Residency Program

Background: The benefits of breastfeeding are well established in the literature and serve as a basis for ACEP and Accreditation Council for Graduate Medical Education (ACGME) policy. However, a lack of workplace research leaves decision-makers without an analytical basis for prioritization of return-to-work (RTW) investments. We undertook, to our knowledge, the first formal, systematic needs assessment of lactating mothers in EM.

Objectives: We aimed to study workplace lactation behavior and to identify barriers to lactation for women in EM. We hypothesized that, through analysis of semi-structured interviews, patterns will emerge that suggest specific, remediable barriers to achieving lactation goals. Some findings will likely be universal to the lactating worker, some unique to EM, and some specific to EM trainees.

1. Identify general and EM-specific barriers and challenges of lactating in the workplace
2. Describe some of the support structures that exist for women lactating at work
3. Consider additional efforts needed to support women returning to work while breastfeeding

Methods: We used qualitative research methods to explore this topic. The initial target population included women affiliated with our department who have delivered and returned to work within the last three years, and a snowball sampling technique was used. Respondents participated in 20-30 minute semi-structured telephone interviews. Audio was transcribed, coded, and analyzed to facilitate inductive research based on the emergence of patterns and themes.

Results: Data from five participants has been preliminarily analyzed, and additional interviews are scheduled. Participants described lactation space essentials, RTW support, their lactation-related goals, and barriers to lactation. Notably, some participants report that their lactation goal-setting was influenced more by workplace barriers than by personal preferences or professional society recommendations. We present these findings and describe how to interpret them in relation to ACGME policies and recent advances in the area of lactation and RTW.

Conclusions: Our hope is that this work will lead to actionable, EM-specific modifications to support lactating women locally and nationally.

9 Assessing for Gender Disparities in the Selection of Chief Residents of Emergency Medicine Residency Programs

Zitek T, Volz E, Steinberg J / Kendall Regional Medical Center; Abbington Hospital; Jefferson Health

Background: Although the number of women physicians has been increasing, there may be gender disparities in the assessment of female emergency medicine residents.

Objectives: The rate at which female emergency medicine residents become chief residents is similar to that of males. This study sought to determine if female emergency medicine residents are less likely to become chief residents than males.

Methods: In July 2017, an anonymous survey was distributed to the program coordinators of all accredited emergency medicine residency programs in the United States. The survey requested the number of males and females in each graduating class from 2015 to 2017. The percentage of female residents who were chief residents was calculated and compared to that for males. Secondarily, an analysis was performed to see if region of the country or method of chief resident selection was associated with the chances of females becoming chief residents.

Results: Program coordinators from 57 residency programs responded to our survey (34% response rate). Of the 683 females in the three graduating classes, 182 (26.6%) were selected as chiefs. This percentage was very similar for males: 26.7% (311/1164). No differences in the female chief residents percentages were seen based upon region of the country. Females were more likely to be chief residents in programs that selected chief residents by resident vote. No other factor relating to how chief residents are selected was found to have a statistically significant association with the percentage of female chief residents.

Conclusions: We found no evidence of a gender disparity with regards to the selection of chief residents for emergency medicine programs.

10 Association between Embedding CME Codes in Web-Based Residency Didactic Feedback Forms and Faculty Completion Rates

Scott K, Delgado M, Conlon L, Mamtani M / Perelman School of Medicine at the University of Pennsylvania

Background: Achieving high completion rates of resident feedback forms remains a challenge in most GME programs. In our program, we identified a void in the feedback provided to residents during weekly didactic conferences. Despite the design and implementation of an electronic, mobile device friendly feedback form, there remained poor faculty completion of the form.

Objective: Determine if embedding conference CME codes into a web-based conference feedback form increases faculty completion of the feedback form.

Methods: We conducted a 20-week intervention trial. Weeks with cancelled or off-site conferences were excluded. During the pre-intervention period (June 2018-September 2018) a mobile device friendly feedback system via Google Forms was distributed and accessed via email and electronic calendar invites. During the intervention period (October 2018-January 2019), we stopped displaying the conference CME codes on the white board of the conference room and instead embedded them directly in the online conference feedback form, such that they could only be viewed upon completion of the form. We performed a t-test of means to determine differences in faculty completion rate by week between the pre- and post-intervention periods.

Results: During the pre-intervention period, a mean of 5.0 faculty/week completed feedback forms. During the post-intervention period, the completion rate increased to 13.2 faculty/week (5.0 vs 13.2, $p < 0.0001$).

Conclusion: Embedding CME codes in a web-based residency didactic feedback form was associated with significant increase in faculty completion rates of these forms. While this study was limited by a pre/post design, there were no known other interventions deployed during these time periods aimed at increasing faculty attendance or form completion rates. This suggests that leveraging the redemption of CME codes is a simple, no-cost solution to increase faculty engagement with web-based residency didactic feedback forms.

11 Basic Life Support and Opioid Overdose Management: Knowledge and Attitudes Among Students Matriculating into Medical School

MacDonald N, Zhang X, Papanagnou D / Sidney Kimmel Medical College atThomas Jefferson University

Background: Basic Life Support (BLS) skills are typically included in undergraduate medical education (UME) curricula. Despite this training, graduating students continue to demonstrate substandard skills retention. In the setting of the opioid epidemic, these skills are essential. Opioid overdose management (OOM) training should occur in conjunction with BLS training. To date, there is a paucity of literature that describes incoming medical students' knowledge and attitudes on these topics prior to beginning their studies.

Objectives: To describe medical students' knowledge and attitudes towards Basic Life Support (BLS) and opioid overdose management prior to their medical training to inform curricular change in undergraduate medical education.

Methods: We conducted an observational, cross-sectional study of 1st-year medical students at a major academic

medical school in Philadelphia, the epicenter of the opioid epidemic. Survey items assessed participants' knowledge and attitudes on BLS and OOM. The survey was voluntary, and deployed through Qualtrics.

Results: 258 students of 272 (95% response rate) completed the survey. 88% agree that BLS training should take place immediately upon matriculation. 74% agree that OOM training should also take place upon matriculation. 32% of respondents had been previously certified in BLS / ACLS, and only 15% had previously received any level of OOM training. Students reported a moderate comfort level with administering chest compressions (5.14±2.9 [Likert Scale 1-10, 10=most comfortable]); and a low comfort level using an AED (4.80±3.1) or assisting an opioid victim (3.74±3.1). With regards to medical knowledge, up to 74% failed to correctly answer knowledge-based questions on basic management principles.

Conclusions: Matriculating students do not have adequate BLS or OOM knowledge upon entering medical school, but wish to have these skills taught to them during their pre-clinical training. Findings should inform UME curricular changes to address the growing opioid epidemic.

12 Beyond Residency: An Initiative for Continuing Education for Emergency Medicine Alumni

Jones J, Houseman J, Ladaga N, Singh M, Cozzi N / Department of Emergency Medicine, College of Human Medicine, Michigan State University; Spectrum Health/ Michigan State University

Background: Free Open Access Medical education (FOAM) is a dynamic collection of resources and tools for lifelong learning in emergency medicine. Predominantly social media based, FOAM resources are easily accessible, portable, allowing learners to educate themselves using tools that suit their needs when the time is right for them.

Objectives: To assess a computer-based newsletter using FOAM resources, which is distributed monthly to practicing EM alumni from one residency program during the past eight years.

Methods: This was a prospective, self-administered online survey sent to 211 physician alumni affiliated with Spectrum Health residency. Each recipient on the mailing list was sent a link to a web-based survey instrument commonly used in academic research. The anonymous survey instrument had 14 open-ended and closed questions to assess the experience, quality, satisfaction with FOAM resources and recommendations. Descriptive statistics were used to summarize the data.

Results: Eighty-five respondents completed the survey (40% response rate), including board-certified (91%) and board-eligible(9%) physicians. Respondents averaged 2.2 hours on FOAM resources each month; accessing approximately 19% of listed educational sites. The majority (94%) felt the content of the FOAM was "of high quality and relevant to my practice" and 83% believed the information would "help in preparation for the national written exams." Overall, 59% of participants utilized the free continuing medical education (CME) sites for credit, averaging 5 CME hours/year. Suggestions to improve the FOAM content included: listing more CME sites (49%), case studies (28%), podcasts and videos (28%), and wilderness medicine resources (22%). Most respondents (86%) felt that residency programs should offer some type of ongoing continuing education to alumni

Conclusions: Computer-assisted instruction using FOAM resources was well received by alumni in our EM residency program.

13 Burnout and Isolation - Effect of Sharing Residency Experiences in an Anonymous Resident-Only Setting

Valle K, Alvarez A, Kellogg A / University of Texas Southwestern; Stanford Emergency Medicine Residency Program; Baystate Medical Center

Background: Burnout is characterized by emotional exhaustion, depersonalization and a lack of sense of personal accomplishment. EM residents experience higher rates of burnout compared to other specialties. Medical errors, substance abuse, depression and suicide are all associated with physician burnout. Peer support has worked well in other environments where shared stressors and trauma are present. An anonymous submission platform may provide a safe space for physicians to share their narrative. This project seeks to present the experiences of EM residents utilizing an anonymous submission platform followed by an in-person reading event in a resident-only setting and assess the effect of sharing and hearing other's experiences.

Objective: The purpose of this initiative was to assess the utility of shared anonymous peer experiences on resident wellness both from sharing and hearing the experiences of others, as well as to provide an outlet for residents with the goal of fostering increased camaraderie.

Methods: 66 residents from a single, urban, county EM residency program were invited to submit their residency stories via a Google Form. Follow-up questions asked what effect the submission had immediately after sharing and whether hearing other's stories would help with the resident's sense of isolation/burnout. After the reading event, residents were surveyed whether the experience affected their wellness positively or negatively.

Results: During October 2019, residents were asked to submit their stories. Stories were compiled and read out loud during the resident-only portion of conference. Ten submissions were made, of these, two indicated that

s.harin.g made them feel worse; the remainder indicated positive impact. All participants indicated they felt hearing other's stories would help with feelings of burnout with 9/10 indicating that hearing the stories indeed helped with their sense of burnout/isolation.

Conclusions: Anonymous sharing of peer experiences in residency may assist in alleviating residents' sense of burnout and isolation as indicated by their post-sharing assessments and post-reading evaluations. Additional sessions will be held in the future to obtain more data regarding the effects of sharing narratives.

14 Change in Resuscitation-Specific Confidence and Anxiety Levels in Residents From a Novel Rotation

Epley C, Berger D, Purekar M, Sawyer K, Burla M, Chen N / Beaumont Health; University of Pittsburgh Medical Center

Background: The Resuscitation Rotation (RR) is a novel month long PGY2 rotation focusing on the highest acuity of patients in EM.

Objective: We performed a survey of EM PGY2 residents regarding their RR experience at a single tertiary care center and analyzed pre-post (PP) responses regarding self-assessment of confidence and anxiety.

Methods: Residents were anonymously and voluntarily surveyed over a three year period with a PP RR survey. Five Likert scale questions, including three measuring confidence and two measuring anxiety, were compared. Higher Likert scale levels indicated higher levels of confidence or anxiety. Non-paired descriptive analyses were performed using frequencies and percentage. To account for unbalanced cohorts and the anonymity of the surveys, post outcomes were tested independently against an ad hoc benchmark (AHB) using exact binomial proportion one-sided tests.

Results: A total of 36 and 25 residents completed surveys before and after the RR, respectively. PP levels of high confidence were as follows; increased from 47.2% to 76% for life saving techniques (LST) increased from 63.9% to 75% for leading a resuscitation (LAR) and increased from 83.3% to 97.1% for knowing when to ask for help (AFH). PP levels of low anxiety were as follows: increased from 77.8 to 95.8% for recognizing different dysrhythmias (RDD) and decreased from 100% to 96% for endotracheal intubations (ETI).

When compared against AHB of 50% high confidence, LST (p=0.01) and LAR (p=0.01) were statistically significant. When compared against AHB of 75%, AFH (p=0.04) was statistically significant. When compared against AHB of 80%, lower anxiety of RDD (p=0.03) was statistically significant and ETI was not.

Conclusions: The data demonstrates that PGY2 EM residents have significant improvement in their confidence in life saving techniques, leading a resuscitation, and asking for help; as well as their anxiety in recognizing different dysrhythmias.

Table 1. High Confidence Response in Situational Confidence.

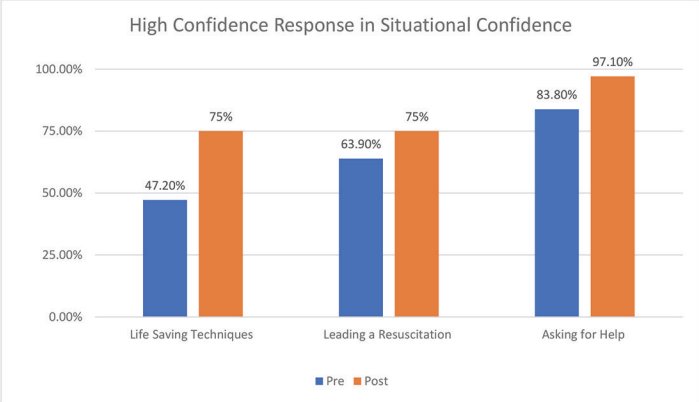
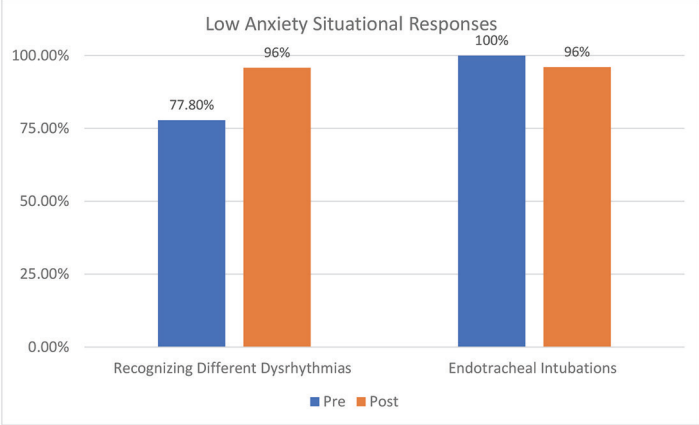


Table 2. Low Anxiety Situational Responses



15 Chief Resident Selection Method by United States Emergency Medicine Residency Programs

Mannix A, Parsons M, Krzyzaniak S, Alvarez A, Mody S, Gottlieb M / University of Florida College of Medicine - Jacksonville; University of Illinois College of Medicine at Peoria; Stanford University; Maimonides Medical Center; Rush University Medical Center

Background: The position of chief resident (CR) has been long established in academic medicine. The role of CR has historically been viewed as a high honor as well as a stepping stone into a successful career. The Emergency Medicine (EM) CR role is not a position obtained simply by being in the final year of training, as it is in some other specialities. Previous studies have looked at input regarding CR selection, they have not evaluated how residents were selected.

Objective: Determine the percentage of elected vs appointed CR selection in United States EM residency programs.

Methods: On December 11, 2018, we compiled a list of all

EM residency programs accredited by the ACGME. Between May 23, 2019 and August 9, 2019, investigators reached out to the programs using established best practices in survey distribution5. Programs were contacted a minimum of three times with no more than one email per week. If there was still no response or no further contacts were available, the program was excluded from the study. The following information was collected: program name, program location, program length, primary type of residency (ie, allopathic or osteopathic), total number of residents, total number of CR, and how CR were selected- by appointment or election. We defined elected as CR who were voted into their position. We defined appointed as CR who were chosen by resident administration without contribution from other stakeholders.

Results: Of the 223 programs contacted, we received a response from 194 (87%) programs. Twenty programs were excluded (11 did not have CR, one program declined participation, and eight did not respond regarding CR selection). Of the included 174, we found the average number of all EM residents per program is 36.6 and the average number of all EM CR per program is 3.2. CR are elected at 72.4% (126/174) and appointed at 27.6% (48/174) of the programs included in the study.

Conclusions: The majority of EM residency programs elect their CR.

16 Coaching in Emergency Medicine: Impact of a Novel National Faculty Development Program

Jordan J, Yarris L, Dorfsman M, Wolf S, Wagner M / UCLA; Oregon Health & Science University, Dept of Emergency Medicine; University of Pittsburgh; Denver Health; Central Michigan University

Background: Didactic lectures remain fundamental in medicine, however many faculty physicians do not receive formal training in instructional delivery. Coaching has recently emerged in medical education with the potential to positively impact skills.

Objective: To evaluate a novel, national faculty peer-coaching program created to improve lectures skills and foster career development.

Methods: This was a mixed methods study. Participants of the CORD Academy Coaching program completed an online evaluative survey consisting of multiple choice and likert-type items. Program coaches participated in semi-structured interviews. Descriptive statistics were reported. Thematic qualitative analysis by two independent reviewers was performed.

Results: Between 2012-2017, 30 participants and 11 coaches from 37 residency programs across the US engaged in the program at 9 distinct EM conferences. 24(80%) participants completed the survey. 8/11(73%) coaches were interviewed. Qualitative analysis percent agreement was 88%. The mean number of national presentations participants had given before and after participation in the coaching program was 6.92 ± 7.68 and 16.42 ± 15.43, respectively. Since participating in the program, 87.5% and 75% of participants have been invited to give a lecture at another institution or another department, respectively. 67-83% of participants felt the program improved their lecture evaluations, public speaking, ability to engage an audience, and provided meaningful feedback, a networking opportunity, and positively contributed to their professional development. 92% would recommend the program to a colleague. Results of qualitative analysis are displayed in Table 1.

Conclusion: This novel, national faculty coaching program was feasible to implement and both participants and coaches perceived multiple benefits. Challenges and suggestions for improvement were identified. These results may inform other coaching programs in medical education.

Table 1. Results of Qualitative Analysis.

Domain	Major Themes	Subthemes	Exemplar Quotes
Benefits to coach	• Career Advancement • Improved Skills • Self-reflection • Applications to other realms • Personal fulfilment • Networking opportunity	• Public speaking • Observation and feedback • Mentoring • Technology and design • Content knowledge • Understanding of structured coaching process • Social connection • Service • Reward of watching participant succeed • Career re-affirmation	• "I learned how to be more systematic, how to optimize my slides and [technology], …how to give feedback-difficult feedback in a very usable manner with appropriate examples." • "Participating in the coaching program made me think about the structure and how we actually do mentoring in my own program…and developing a coaching program at my own institution. In addition, I've started doing speaking engagements for other departments on coaching and talking about the differences between coaching and mentoring."
Challenges encountered	• Related to the coach • Related to the program • Related to the participant	• Self doubt/ imposter syndrome • Scheduling • Communication • Time • Lack of engagement • Emotional response	• "The biggest challenge was coordinating schedules."
Comparison to other mentoring experiences	• Structured • Time-limited		• "What I really liked about this is that it's very structured."
Suggestions for program improvement	• Increased marketing • Increased mentor participation • Increased participant engagement • Improved administrative processes • Clear expectations		• "The more that people put into [the self-reflection sheet], the better it is to identify what they want out of the session and the more we have to offer them."

17 Collegial Physician Weight Bias: A National Survey Project to Guide Implicit Bias Training

McLean M, McLean L, McLean-Holden A, Horner A, Kulkarni m, Melville L, Fernandez E / St. John's Riverside Hospital; Arizona State University; University of Texas Southwestern Medical Center; New York Presbyterian Brooklyn Methodist Hospital

Background: Implicit bias among physicians contributes to healthcare disparities. Prior investigations have described physician weight bias toward patients, but no literature exists regarding inter-physician or "collegial" weight bias (CWB). This is needed to guide training for more inclusive medical workplaces.

Objectives: Introduce a survey and present pilot results for use in implicit bias training guidance for more inclusive medical workplaces. This study describes the degree and nature of CWB. We anticipate that implicit (IWB) towards colleagues exists among physicians, and is related to explicit (EWB)and professional weight bias (PWB).

Methods: In this cross-sectional study, a survey was created to measure physician CWB. It included the investigator-developed Weight-Based Professionalism and Collaboration Scale, and adaptations of 2 previously validated measures: the Implicit Association Test (IAT) and the Crandall Antifat Attitudes Questionnaire. The IAT has users sort images (obese and average weight physician silhouettes) and words (good and bad physician adjectives) to make inferences about IWB. The other measures have users rate their bias on a Likert scale. The survey was distributed via medical society message boards, listservs, and social media.

Results: 617 physicians completed the survey, ages ranged 22-83 years (mean 44 years); 78% were EM specialists, 75% were Caucasian, 58% were female. Analyses revealed that 87% had some degree of IWB, and older, male, and non-overweight participants had increased bias on all measures. There were also positive associations between IWB andEWB/PWB.

Conclusions: Most participants had implicit CWB; and older, male, and non-overweight physicians had the most. There were direct, positive associations between IWB and EWB. Participants with high IWB reported negative views and decreased intents to collaborate with overweight colleagues. This knowledge highlights disparities faced by overweight physicians and can guide workplace bias training.

Image 1. Sample Implicit Association Test words and images used to assess implicit physician weight bias.

Table 1. Correlations among study variables.

	1	2	3	4	5	6
1. IWB	1					
2. EWB	0.24**	1				
3. PWB	0.16**	0.73**	1			
4. Age	0.15**	-0.10*	-0.02	1		
5. BMI	-0.10*	-0.10*	0.11*	0.19**	1	
6. Sex	0.10*	0.10*	0.06	0.20**	0.19**	1

* correlation significant at p<0.05
** correlation significant at p<0.01

IWB, implicit weight bias; *EWB*, explicit weight bias; *PWB,* professionalism & collaboration weight bias.

18 Correlation of Attending and Patient Assessment of Resident Communication Skills in the Emergency Department

Lewis J, Balaji L, Grossestreuer A, Rosen C, Dubosh N / Beth Israel Deaconess Medical Center/Harvard Affiliated

Background: Communication and interpersonal skills are one of the ACGME's six core competencies. Valid methods for assessing these are lacking. Various communication assessment tools have been developed, including those from faculty and patient perspectives. How these different assessors compare is unknown.

Objectives: The goal of this study was to determine the degree of agreement between attending and patient assessment of resident communication skills. We hypothesized that the two measures would have substantial agreement.

Methods: This was a retrospective analysis of a prospectively collected dataset of EM residents at an academic medical center. From July 2017 – June 2018, residents were assessed on communication skills during their emergency department shifts by both patients and EM faculty. Patients completed the Communication Assessment Tool (CAT), a validated 14-item questionnaire based on a 1-5 Likert scale. Faculty rated residents' communication skills with patients, colleagues, and nursing/ancillary staff using a 1-5 Likert scale. We calculated mean CAT score and mean faculty ratings for each resident. Means were divided into tertiles due to nonparametric distribution of scores. Agreement between CAT and attending ratings of residents were measured using Cohen's Kappa for each attending evaluation question. Scores were weighted to assign adjacent tertiles partial agreement.

Results: During the study period, 952 CAT questionnaires and 1097 faculty evaluations were completed for 26 residents. CAT scores and attending evaluation of patient communication (k 0.21), communication with colleagues (k 0.21) and communication with nursing/ancillary staff (k 0.26) showed fair agreement.

Conclusions: There is fair agreement of patient and faculty ratings of EM residents' communication skills. The use of different types of raters may be beneficial in assessing trainees' communication skills.

19 Defining "Service over Education" by Emergency Medicine Residents

Obr B, Takacs M, Barlow P, Runde D / University of Iowa Hospitals and Clinics

Background: The ACGME Annual Program Evaluation is provided to resident trainees nationwide. One question asks the extent to which a resident's program values "Service over Education" (SOE). EM residency programs generally perform poorly on this metric, though the understanding of what constitutes SOE is not well understood.

Objectives: To assess EM resident perceptions of what is meant by the term "service over education" as it relates to the annual program evaluation survey. To better understand resident perceptions of what it means to define service over education, we sought structured input from EM residents nationwide.

Methods: This study was survey-based. The study population included residents currently enrolled in a CORD-affiliated EM residency. The survey was provided via the CORD listserv in October-November, 2017. Resident responses constitute a convenience sample. This included a question regarding the extent residents felt their program prioritized SOE and a question requesting examples of what prioritizing SOE means to them. These responses were coded separately for thematic analysis and analyzed.

Results: 390 residents completed at least a portion of the survey. 43% of respondents reported their program prioritized service over education half the time or more. 263 provided comments of what prioritizing service over education meant to them. Initial thematic agreement was achieved on 87% of resident responses and the remaining 13% of differences were resolved through consensus discussion. 10 significant themes were identified, the four most common being: prioritizing clinical throughput over education (67%); deprioritizing educational opportunities (24%); altruistically putting the needs of the patient over education (15%); and obligations to off-service rotations (14%).

Conclusions: Residents have a varied understanding of what it means to prioritize "service over education", and more than 40% felt it occurred in their program. The ability of educational leaders to understand these perceptions may help them better educate residents and assess feedback from the ACGME survey.

20 Developing a Telehealth Checklist Using the Modified Delphi Method

Joshi A, Silvas K, Chandra S / Thomas Jefferson University; JeffConnect; Allegheny Health Network Internal Medicine

Introduction: Telehealth, using technology for remote patient encounters in healthcare, has been growing as a care modality. While it continues to advance, training and medical education has not kept pace. The authors perform on-demand EM visits with residents; however, standardized evaluation strategies do not exist.

Objective: Our objective was to create a telehealth checklist to evaluate telehealth visits using the Modified Delphi method.

1. Evaluate the current state of telehealth education and training
2. Create a telehealth checklist with an expert committee using the modified delphi method
3. Utilize created checklist to evaluate telehealth visits in

graduate medical education in future studies

Methods: Experts in telehealth and education were defined as working at an education institution teaching both undergraduate and graduate medical education, had an active telehealth program, and had students and residents working and using telehealth at their institution. Those fitting the description were approached by a team at Thomas Jefferson and invited to be in the working group. Participants were confirmed and group was created in May 2019. Over the next 3 months, the group went through a modified Delphi method and repeated iterations to create a 15 point checklist.

Results: Eighteen experts were approached and 9 accepted to be part of the working group. Each member participated in 4 rounds. Round 1 included free responses to 'anything thought to be necessary to include in a checklist for an observer to evaluate a telehealth provider over video'. Round 2 asked participants to rank all entrants as 'must have' 'neutral' or 'remove'. Any answer with 80% removal recommendation did not continue on to round 3. Round 3 used the same format. Round 4 asked for participants to pick their top 15 of remaining answers to be in the checklist. The team removed answers that were redundant, and then compiled and ordered the answers for flow. The resulting checklist had 15 points.

Conclusion: Using a modified Delphi method, 9 experts were able to come to consensus on a telehealth visit checklist. Our next step will be a multicenter validation of the checklist with residents and for future use in telehealth education.

- Confirms the provider is using a secure, HIPAA compliant video conferencing platform
- Confirms adequate audio and video quality by confirming patient and provider can both hear and see each other
- Provider is clear on what can/can't be done over telehealth
- Confirms appropriate background environment including background, lighting and confidentiality
- Reviews any specific concerns regarding telemedicine consent
- If provider needs to turn away, informs patient of it (needing to look at chart, pictures, etc)
- Keeps eye contact with camera at eye level so provider appears to be looking at patient
- If there is technical difficulty, provider provides some basic troubleshooting (turning camera and mic on/off, changing browser, inputting information)
- If tech issues cannot be resolved, provider reaches out to tech support
- Demonstrates the ability to adjust/zoom the camera to visualize area of complaint
- Guides patient through self-administered physical exam with equipment available
- Asks to make observation of patient's home/environment for confidentiality and patient care as needed
- Provider has plan for emergencies – call 911, provide patient location, or refer to closest ER/UC
- Follows current national, state, and institutional policies on controlled substance prescription through telemedicine visits
- Provider appropriately disconnects from the visit and signs off (doesn't just hang up)

Figure 1. Telehealth Checklist for Simulation Cases

Table 1: Telehealth Checklist Consensus Committee Members.

Name	Title	Institution
Bart Damerschalk MD, MSc, FRCPC	Professor of Neurology Medical Director of the Center for Connected Care	Mayo Clinic College of Medicine & Science
Emily Hayden MD, MHPE	Director of Telemedicine Department of Emergency Medicine	Massachusetts General Hospital
Aditi Joshi MD, MSc	Medical Director, JeffConnect Assistant Professor, Department of Emergency Medicine Associate Director, Digital Health Scholarly Inquiry	Thomas Jefferson University Hospital Sidney Kimmel Medical College
Mark Lo MD, MS	Pediatric Emergency Medicine Medical Director, Telehealth and Digital Healthl Clinical Associate Professor of Pediatrics	Seattle Children's Hospital University of Washington School of Medicine
Neel K. Naik MD	Director of Emergency Medicine Simulation Education Attending Physician of Emergency Medicine	New York Presbyterian Weill Cornell Medicine
Dana Schinasi MD	Attending Physician, Pediatric Emergency Medicine Medical Director, Telehealth Programs	Ann & Robert H. Lurie Children's Hospital of Chicago Northwestern University Feinberg School of Medicine
Neal Sikka MD	Co-Chief, Section of Innovative Practice Associate Professor of Emergency Medicine	George Washington University
Eric Wallace MD, FASN	Associate Professor of Medicine UAB Medical Director of Telemedicine Associate Fellowship Program Director	University of Alabama at Birmingham
Jeremy Young MD, MPH	Assistant Professor of Clinical Medicine Director, ID Fellowship	University of Illinois-Chicago

21 Do Gender, Age, and Seniority Affect Resident Assessments of Emergency Medicine Teaching Faculty?

Dubey E, Meram S, Liu T, Reed B, Smylie L, Paxton J / WSU Detroit Medical Center; Wayne State University

Objective: This study aimed to determine whether quantitative competency scores of faculty member performance, as judged by categorical EM residents, appear to be influenced by the gender, age or seniority of the faculty member being assessed.

Methods: Teaching assessments completed by categorical EM residents at two high-volume urban, teaching hospitals over a period of 5 years were reviewed. Survey questions addressed five

key attributes of teaching faculty (teaching, clinical knowledge, administration, interpersonal skills, and scholarly contributions) on a five-item Likert scale, totaling 25 points per assessment. Only completed assessments (with all 5 questions scored) were included in the primary analysis. Those evaluations missing only 1 of the 5 responses were also analyzed separately.

Results: Resident assessments for 109 EM faculty were reviewed, including 27 junior faculty, and 36 females. The mean age for all faculty was 45.3 years, with mean ages of 45.8 and 44.3 years for males and females, respectively (p=.4274). A total of 12,733 evaluations were reviewed, with 6,056 (47.6%) completed assessments included in the primary analysis. Mean total assessment scores were 15.2 and 15.4 out of 25 possible points for males and females, respectively (p=.4326). Mean total assessment scores were similar for junior faculty and senior faculty at 15.8 vs. 15.9 respectively (p=.7660). Scores did not vary between different age categories: 15.5 for "40 and under", 15.0 for "41-50", 15.3 for "51-60", and14.8 for ">60 years" (p=0.1369).

Conclusions: We found no significant gender- or age-based differences in faculty assessments by EM residents over a 5-year period at two urban emergency medicine residency programs. We also found no differences in assessments based on level of faculty training in the primary analysis, although senior faculty received higher scores than junior faculty in the secondary analysis group. Also, the resident PGY year of the evaluator had no effect on faculty assessment scores. Further study is needed with larger data sets and a more diverse resident cohort.

22 Does Emergency Department Sign-out Matter for Patient Safety and Patient Care Efficiency? A Survey of the Perception of Emergency Medicine Residents and Attending Physicians on the Effect of Sign-out

Trung T, Obando M, Franke E, Chu F, Marra E, Sleisinger T / Aventura Emergency Medicine

Background: The Joint Commission recognized improper handoffs/sign-outs as a major source of medical errors. Implementation of a standardized sign-out protocol in the ED was shown to lead to a decreased length of stay and increased frequency of ED bedside rounding. The question that has yet to be asked is: how does residency training affect one's perception of sign-out on safety and efficiency?

Objectives: To evaluate how the effect of sign-out on patient safety and patient care efficiency differs among ED residents and attending physicians. Methods: Investigators surveyed attending physicians and residents of five EM programs via email and paper surveys. 85 survey samples were completed, with 31 PGY-1s, 16 PGY-2s, 19 PGY-3s, and 18 attending physicians. Descriptive statistics and t-test for comparison of items on a Likert scale were obtained. The measured outcome is the participants' perception of the relative importance of sign-out as a contributor to patient safety and care efficiency.

Results: 30% of respondents never received any training on proper sign-out. 13% considered sign-out as having "little effect" or "no effect" on patient safety and care efficiency. 74% thought sign-out affected safety "a great deal" or "a lot", with 53% similar answers on care efficiency. PGY-1 residents' perception on the relative importance of sign-out on care efficiency is lower than that of attending physicians' ($p<0.05$), but this difference disappears between groups (ANOVA, $p>0.05$). There is no statistical difference between groups ($p>0.05$) in the perception of the relative importance of sign-out on patient safety.

Conclusion: The results of this survey suggest that training enhances residents' perception of the effect of sign-out on patient care efficiency. Moreover, it suggests that greater efforts should be emphasized on sign-out education in the emergency department and the implementation a standardized sign-out protocol.

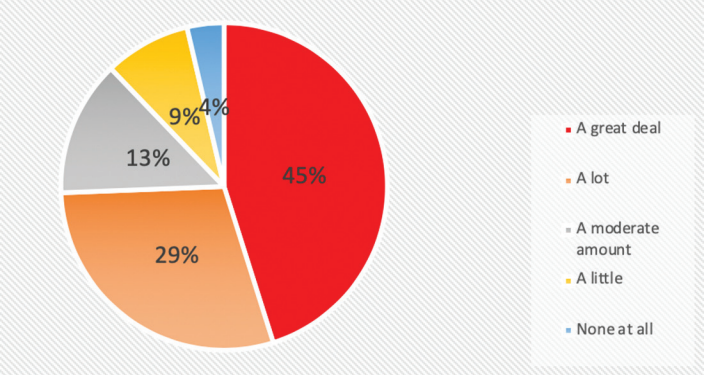


Figure 1. Perception on the effect of signout on efficiency of care.

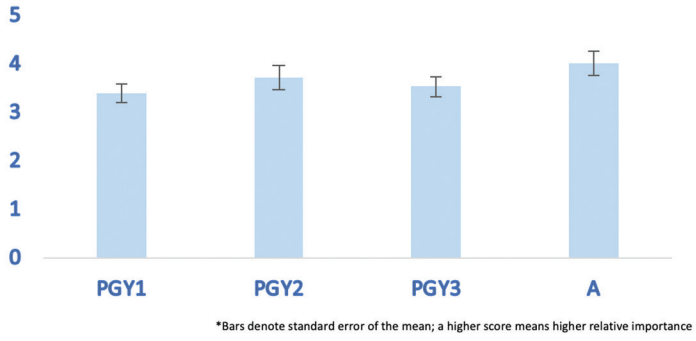


Figure 2. Perception of how sign-out affects patient safety among all residents and attending physicians.

23 Does Predicted Ranking on SLOE Correlate With Final Rank Order List

Moreira M, Angerhofer C, Sungar W, Buchanan J, Byyny R / Denver Health Medical Center,

Introduction: The Standardized Letter of Evaluation (SLOE) has been cited as the most important factor for Program Directors in the assessment of emergency medicine residency applicants. Arguably, the most important part of this letter is the global assessment and the predicted rank order placement for a given applicant. Our study looks at the concordance of this predicted rank order placement compared to the final ranking of our applicants within a single program. Our hypothesis was that there would be a low proportion of agreement.

Objective: Our study looks at the concordance of the predicted ranking on the Standardized Letter of Evaluation (SLOE) compared to the final submitted ranking of our applicants to the NRMP within a single program.

Methods: The study was performed at a 4-year Emergency Medicine Residency Program with 68 residents at an urban Level 1 Trauma Center. The SLOEs for emergency medicine rotators from 2015-2017 were reviewed looking at predicted rank. The predicted rank was then compared to the final rank on the submitted rank order list based on categories - Top 10%, Upper third, Middle third, and Lower third.

Results: Between 2015-2017, 206 students rotated with our residency program, 161 SLOEs were uploaded to ERAS and reviewed for the purpose of this study. There were 47 (29.2% [95%CI: 22.3-36.9]) that were concordant. Of the discordant ranks, 82 (50.9% [95%CI: 42.9-58.9]) were off by one category, 56 (34.8% [95%: CI 27.5-42.7]) were off by 2 categories, and 30 (18.6% [95%CI: 12.9-25.5]) were off by 3 categories.

Conclusion: There was poor concordance between predicted rank order on the SLOE compared to the final position on the submitted rank order list. This calls into question the validity of the ranking on the SLOE and the amount of emphasis that should be placed on that value. The next step is to perform this study at multiple programs to assess whether this is a national trend.

24 Does the MSPE Change the Decision to Invite Residency Applicants?

Thimm T, Kilpatrick J, Aloi M, Davenport M, Jennings L, Bush J, Davis S, Quedado K, Kiefer C, Shaver E / West Virginia University; Allegheny General Hospital, Medical University of South Carolina,

Background: Although EM residency program directors (PDs) have multiple sources to evaluate each applicant, many await the release of the medical student performance evaluation (MSPE) to finalize interview invitations. No prior work has evaluated the impact of the MSPE on this decision.

Objective: The purpose of this study was to determine whether MSPE review changes the decision to invite. Given the prior literature supporting the importance placed on the standardized letter of evaluation (SLOE), our hypothesis was that there would be no significant change in invite status after MSPE review.

Methods: We conducted a prospective observational study analyzing applications to 3 EM residency programs during the 2019-2020 match cycle. Reviewers first assessed applications without the MSPE, and subsequently, with the MSPE. Using an online survey tool, faculty scored each review on a Likert scale indicating likelihood to invite. Descriptive analysis was then performed.

Results: A total of 1,001 applications were reviewed. Invitations were extended to 103 applicants prior to MSPE review and 2 applications were missing data; these 105 applications were excluded from analysis. Of the remaining 896 applications, reviewers' impression changed ≥ 1 point on the Likert scale 166 times—with only 1 application changing from 1 or 2 (definitely/probably no) to 4 or 5 (probably/definitely yes) and 34 changing from 3 (unsure) to 4 or 5. Thirteen applications changed from 4 or 5 to ≤ 3. For applications with no change, the SLOE was the driving decision 534 times (73%). When the MSPE changed the impression, narrative comments were the most influential factor in 74 reviews (45%).

Conclusions: Review of the MSPE rarely changes a PD's decision to invite an applicant. Therefore, awaiting the release of the MSPE to invite applicants may be low yield. Further work is needed to determine PDs' comfort level with offering invitations prior to MSPE review.

25 Does Visual Instruction Improve Emergency Medicine Residents' Competency in Performing Cricothyrotomy Over Written Instruction?

Beaulieu A, Patel V / University of Massachusetts

Background: Cricothyrotomy is a rare, but lifesaving procedure which all EM physicians must be able to perform during critical airway events. Traditionally, procedural training in residency has been taught utilizing written instruction; with access to free open access media (FOAM), there has been an increase in the number of videos available to learn procedural skills. Our goal was to compare teaching strategies to improve resident competency and overall comfort level of rare procedures.

Objectives: The purpose of this study was to compare the efficacy of written vs visual instruction of cricothyrotomy technique in a cohort of emergency medicine resident trainees.

Methods: EM residents at an academic medical center were randomized to either read a textbook chapter or watch

a video on cricothyrotomy. Residents with prior clinical cricothyrotomy experience were excluded. All enrolled residents performed a cricothyrotomy on a simulation model. Primary outcomes included time to completion and number of mistakes which were recorded by a blinded surveyor. Secondary outcomes, rated on a Likert scale, included comfort level and preparation level. Outcomes were compared by paired t-test.

Results: Of the 31 of residents enrolled, 27 met inclusion criteria, 15 received visual instruction and 12 received written instruction. Both comfort level of cricothyrotomy and average time to completion were significantly better for visual instruction compared to written instruction. Level of preparation and number of mistakes was not significant between groups. Year of training did not influence results.

Conclusion: Visual instruction improved the time to completion and resident level of comfort when compared to written instruction for residents performing a cricothyrotomy on a simulation model. With limited time and resources for rare procedural training during residency, visual instruction from FOAM prior to procedural training may help improve resident competency.

26 Ethical Issues Confronting Beginning Medical Students During a Clerkship in Emergency Medicine

Jones J, Ladaga N, Sapp T, Singh M, Emery M / Department of Emergency Medicine, College of Human Medicine, Michigan State University

Background: Little is known about the ethical issues confronting medical students during their first exposure to emergency medicine (EM).

Objectives: The aim of this study was to review student narratives for insight into ethical situations and the impact they might have on our students as they adapt to the clinical world.

Methods: This was a prospective observational study of first and second-year medical students, completing an EM clerkship at three university-affiliated hospitals between 2014-2017. During the study period, medical students were asked to write a short narrative description of three cases that had the greatest impact on them. Each narrative essay was deindentified and independently analyzed by three EM investigators using a national classification scheme. Descriptive and kappa statistics were used to summarize the data.

Results: During the four-year study period, 292 consecutive student essays were evaluated from 103 medical students. A total of 194 specific incidents were coded across 20 categories of ethical standards. Common categories were incidents related to: access to and equity in healthcare (16.5%); consent (10.8%); miscommunication (9.3%); death and dying (8.8%); and the right to refuse treatment (8.8%). Overall, 74.2% (144/194) were depictions of exemplary instances of ethical issues, 13.9% (27/194) were considered normal interactions, and 11.9% (23/194) were categorized as unethical behavior. While students were impressed by their observations of EM physicians and staff, their eyes were opened to the improper treatment of acutely ill patients, be it poor pain management, discrimination, inadequate education, or a perceived lack of empathy.

Conclusions: Student narratives provide insight into learning not easily measured by traditional evaluation. Analysis of these cases reveals that many interactions are intimately tied to the student's role on the medical health care team, and how that role can lead to ethical compromise.

27 Evaluating Evaluations: Can Emergency Medicine Residents Reliably Evaluate Medical Students

Milman B, Dodson J, Gentges J / University of Oklahoma Health Sciences Center

Background: Evaluation of learners is a critical task in medical education. The standardized letter of evaluation (SLOE) is the most important factor in determining which applicants to interview. At most programs, residents evaluate students on shift and these evaluations contribute to the SLOE. To date, there is limited published data evaluating the ability of residents to evaluate medical students.

Objectives: The hypothesis of this study is that the scores that residents give to rotating medical students do not follow a normal distribution. This study aims to better characterize the way residents evaluate medical students.

- Discuss methods for student evaluation by residents.
- Describe the skewed distribution that residents assign to students.

Methods: We conducted a retrospective cross-sectional study. We obtained evaluations performed by residents for all students that rotated with the University of Oklahoma Department of Emergency Medicine between July 2019 and October 2019. Evaluators are asked to assign each student to a tertile based on the clinical areas outlined in the SLOE. We used chi-squared testing to determine significance.

Results: Between July and October 2019, 35 fourth year medical students rotated through our emergency department. We collected 283 on-shift evaluations from the residents. When asked the question, "How does this student compare overall to peers?" 20% of students were assigned "Top 10%," 47% of students fell in the "Top 1/3," 30% of students in the "Middle 1/3" and 3% of students in the "Lower 1/3" ($p < 0.0001$). Distribution was also statistically significant for all other questions on the shift evaluation form.

Conclusions: Residents are hesitant to assign a "lower 1/3" designation to medical students. Letter writers are required to redistribute students for the SLOE and eventual rank list. Future interventions and training to more accurately

evaluate medical students may result in improved evaluation of medical students by residents.

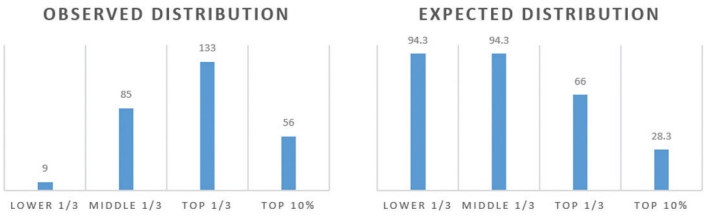


Figure 1.

28 Evaluating the Effect of Resident Physicians in a Supervisory Role on Clinical Efficiency in a University-Affiliated Community Emergency Department

Kraut A, Sheehy L, Schnapp B, Patterson B / University of Wisconsin Madison, School of Medicine and Public Health, Madison, Wisconsin

Introduction: While patient throughput and emergency department (ED) length of stay (LOS) are recognized as important metrics in the delivery of efficient care, they must be balanced with the educational mission of academic centers. Prior studies have examined the impact of learners on ED throughput and LOS when staffing directly with attending physicians and have yielded mixed results. Herein we sought to examine the impact of a staffing model involving a supervisory resident "pre-attending" (PAT) on ED throughput and LOS, as this model offers a valuable educational experience for residents, but may do so at the expense of operational efficiency. Methods: 26,702 unique patient encounters at a university-affiliated community ED between 7/1/2017 and 1/1/2019 were retrospectively analyzed (Table 1). The experimental group was comprised of patients seen primarily by midlevel providers (APP), who staffed with a PAT, who, in turn, staffed with an attending physician. The control group was comprised of patients seen by an APP and staffed directly with attendings without a PAT (Figure 1). A parametric hazard model was used to analyze the effect of the presence of a PAT on service time, controlling for potential confounders including timing of presentation and patient demographics.

Objective: To determine the effect of a supervisory resident "pre-attending" physician (PAT) on the clinical efficiency of a university-affiliated emergency department (ED).

Results: The presence of a PAT is associated with a statistically significant increase in service time of 5 minutes (p = 0.006). Holding other variables equal, predicted service time in the experimental group was 173 min (95%CI 171-176), while that for controls was 168 min (95%CI 165-171).

Conclusion: The presence of a PAT is associated with a statistically significant increase in service time, but the magnitude (5 minutes) is likely operationally insignificant. The negligible increase in service time is offset by the benefit to residents' training. The results of this study may be helpful for residency programs considering a PAT shift structure for their training program.

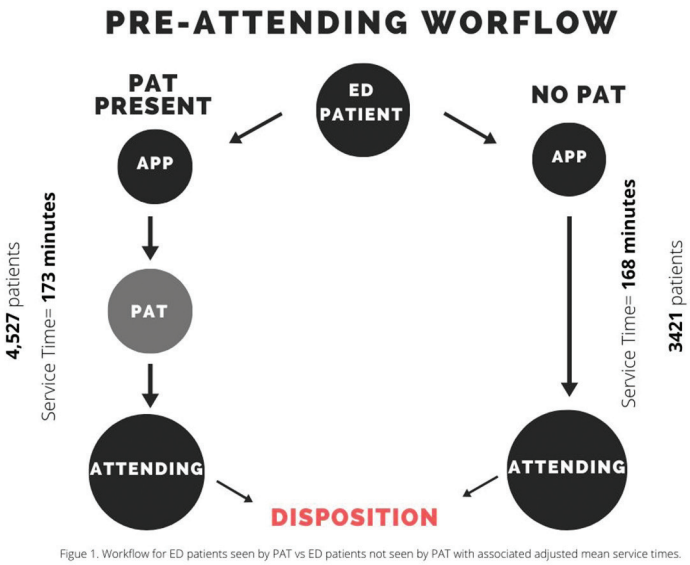


Figure 1.

Table 1. Patient demographics for control and experimental groups.

	Pre-attending Encounters (N = 4527)	Non Pre-attending Encounters (N=3421
Age	47.7(47.1-48.4)	45.8(45.0-46.5)
Female Gender	57.8(56.3-59.2)	54.4(52.7-56.0)
Proportion Discharged	78.4(77.2-79.5)	80.5(79.1-81.8)

29 Evaluation of a Blended Curriculum on Medical Student Outcomes in an Emergency Medicine Clerkship

Chandra S, Papanagnou D, Jenkins M, / Thomas Jefferson University; Johns Hopkins University

Background: Educational programs have adapted to incorporate instructional strategies that better align with how adults learn. In response to a needs analysis of the Emergency Medicine (EM) clerkship at the Sidney Kimmel Medical College at Thomas Jefferson University, the clerkship was changed to a blended format consisting of internet-based, asynchronous learning, flipped-classroom, and in-person sessions. The goal of the study was to compare the effectiveness of the new format compared to the traditional lecture series.

Objective: The goal of the study was to compare the effectiveness of a blended curriculum consisting of internet-based, asynchronous learning, flipped-classroom, and in-person sessions compared to a traditional lecture series.

Methods: We performed a causality-comparative study, gathering data from fourth-year medical students (MS-IV) in the clerkship and faculty over a six-month period: 3 months with the didactic series and 3 months with the blended format. Data included final examination scores, simulation performance and satisfaction surveys of students and faculty. The student t-test was used to compare means between groups.

Results: Seventy-four MS-IVs were in the pre group and 63 MS-IVs were in the post group; 10 faculty were enrolled. Examination scores were statistically higher ($p<0.01$) for the post-group (84.8%, 95% CI 83.1-86.5) compared to the pre-group (80.8%, 95% CI 79.1- 82.5). Simulation scores were significantly higher ($p<0.0001$) for the blended curriculum in weeks 1 and 2, but not in week 3. Students rated the blended curriculum higher ($p<0.001$). Overall difference in means for faculty satisfaction was not statistically significant.

Conclusion: The blended curriculum model is an effective educational intervention to teach EM medical students. Longitudinal follow-up with students may provide insight into the enduring impact of the blended curriculum on learning outcomes.

30 Focusing Feedback: A Resident Based Intervention

Pomeranz K, Runde D, Buresh C, Takacs M, Hansen N, Bobb Swanson M, Harland K, Obr B / University of Iowa

Background: Feedback and evaluation are crucial in residency training. Constructive feedback allows residents to develop while honing in on weaknesses to improve their clinical practice. Due to time constraints, protection of relationships, privacy, and lack of feedback training, giving and receiving quality feedback is difficult.

Objectives: The purpose of this study is to determine if there is qualitative improvement in feedback or evaluations when residents are encouraged to set a goal for each shift. To assess for quality improvement in resident evaluations following an intervention.

Methods: This is a retrospective before-after study of a resident self-initiated feedback intervention at a single EM program. The resident feedback intervention included the introduction of a paper evaluation form called "Self-Initiated Resident Feedback is Utterly Phenomenal" (SIRF's UP) where residents would select pre-shift goals to focus on based off of ACGME requirements for evaluation. Evaluations were assessed for improvement with focus on clarity, subjectivity, actionability, and specificity. Three blinded reviewers scored evaluations on a Likert scale for each domain. Post-intervention evaluations were rated on whether the faculty evaluation met the resident's stated goal. Descriptive statistics and repeated measures regression were used to test for differences in pre- and post-intervention evaluation data.

Results: There were 183 pre- and 183 post-evaluations. Resident evaluations after the intervention were more specific (mean difference[MD] 0.56, $p<0.001$), more actionable (MD: 0.56, $p<0.001$), more clear (MD: 0.43, $p<0.001$), and less subjective (MD: -0.69, $p<0.001$) than evaluations before the intervention. In the post-evaluations, 90.4% of the faculty evaluations were rated to meet (Strongly Agree/Agree) the resident's pre-stated goal for the shift.

Conclusions: This intervention was feasible and resulted in feedback that was less subjective and more specific, actionable,and clear while also aligning with individual resident feedback goals.

31 Foundations of Emergency Medicine: Trends in Use, Perceived Benefits, and Barriers to Implementation

Grabow Moore K, Weygandt P, Jordan J, Ketterer A, Wheaton N, Berberian J, Caretta-Weyer H / Emory University School of Medicine; Johns Hopkins University School of Medicine; UCLA; Beth Israel Deaconess Medical Center/Harvard Affiliated; David Geffen School of Medicine at UCLA; Christiana Care Health System; Stanford Emergency Medicine Residency Program

Background: Foundations of Emergency Medicine (FoEM) was introduced in 2016 as a novel, nation wide open-access emergency medicine (EM) curriculum that provides interactive instruction specific to learner level. Limited data exist on stakeholders' attitudes toward its implementation.

Objective: To evaluate use, perceived benefits, and barriers to implementation of FoEM.

Methods: This was a survey study of FoEM site leaders and learners. Surveys were administered online and consisted of Likert scale and multiple choice items. Survey items were piloted prior to implementation. Sites were excluded if they registered after December 2018 or reported nonuse or limited use of content. Descriptive statistics were reported.

Results: 130 of 247 US EM residency programs (53%) registered for FoEM for 2018-2019. 102 programs were eligible to participate in the study. 98 site leaders (96%) and 1618 learners (54%) completed the surveys. Enrollment data (Table 1) shows highest use of Foundations I (F1) and II (F2) , EKG I, and In-Training Exam (ITE) Review materials. 37 sites (38%) allowed structured resident-as-teacher opportunities. Site leaders reported 100% satisfaction and limited required preparation (mean 1.16 hr/wk) (Table 2). 60% felt learners came prepared for meetings and 61% reported that F1 small group cases helped identify learners who required extra support. Barriers to implementation include limited conference time (67%) and faculty oversight (48%). Learners reported high satisfaction (93%) and indicated adherence to asynchronous assignments (mean 1.6 hr/wk). 87% reported a perceived reduction in the chance of making a medical error as a result of exposure to FoEM content.

Conclusions: FoEM has been widely implemented across

US EM residency programs and is viewed positively by both leaders and learners. Potential benefits include identification of struggling learners. Program logistics may limit implementation.

Table 1. Foundations of Emergency Medicine Enrollment (USA, 2018-2019).

Course	Programs	PGY1	PGY2	PGY3	PGY4	Total
Foundations I (F1)*	**95**	1069	235	162	57	**1523**
Foundations II (F2)*	**74**	239	719	417	90	**1465**
Foundations III (F3)*	**34**	97	146	286	70	**599**
EKG I**	**48**	570	204	185	48	**1007**
EKG II**	**37**	305	329	266	50	**950**
Imaging I	**23**	269	111	98	17	**495**
ITE Review	**59**	719	450	377	106	**1652**
Frameworks	**22**	248	81	66	12	**407**
Resident Instructors	**37**	51	40	164	79	**334**

*Foundations I-III cover EM Model core content; F1 targets PGY1s, F2 targets PGY2s, F3 targets PGY3/4s.
**EKG I covers fundamental EKG topics targeting PGY1s; EKG II covers advanced topics for PGY2/3s.

Table 2. Foundations of Emergency Medicine Survey Results (2018-2019).

Leaders		
Survey Item		
Please rate your satisfaction with Foundations of Emergency Medicine. (1-Very Satisfied, 3-Neutral, 5-Very Dissatisfied)	**Satisfied/Very Satisfied** 100%	**N** 98
My learners come prepared for Foundations (F1, F2) meetings. (1-Strongly Agree, 3-Neutral, 5-Strongly Disagree)	**Agree/Strongly Agree** 60.2%	**N** 93
F1 small group cases have helped our residency leadership identify learners who might benefit from additional support. (Yes/No)	**Yes** 60.5%	**N** 81
How many hours did you spend each week coordinating meetings for Foundations core courses (F1, F2, F3)? (n=88)	**Mean** 1.17	**SD** 0.79
What are the barriers to using additional Foundations courses at your site? (n=94)	Limited time in conference schedule = **67%** Available faculty oversight = **48%** Faculty resistance = **5.3%** Resident resistance = **4.3%** Quality of content = **5.3%** Awareness of available content = **8.5%** Other = **23%**	
Learners		
Survey Item		
Please rate your satisfaction with Foundations of Emergency Medicine. (1-Very Satisfied, 3-Neutral, 5-Very Dissatisfied)	**Satisfied/Very Satisfied** 93%	**N** 1612
On average, how many hours do you spend on Learning Pathway (independent study) assignments prior to Foundations I or II meetings? (n=XXX)	**Mean** 1.57	**SD** 0.96
Do you feel that your exposure to Foundations has reduced the chance of you making a medical error? (Yes/No)	**Yes** 87%	**N** 1603

F1, Foundations I course; F2, Foundations II course; F3, Foundations III course; Learning Pathway, asynchronous assignments coordinated to F1 and F2 meetings.

32 Gender Evaluation and Numeric Distribution in Emergency Medicine Residencies. Understanding Contributing Factors to Gender Differences Within US Emergency Medicine Programs

Gibney R, Cantwell C, Toohey S, Wray A, Wiechmann W, Boysen Osborn M / University of California Irvine

Background: Emergency medicine has experienced increased growth, with addition of over 500 residency positions over the past 10 years. It could be assumed that increased ethnic, gender, and cultural diversity would also be seen, however, this is not the case.

Objectives: The study was designed to determine the male-to-female ratio of EM residencies, serving as a proxy for the specialty. Our hypothesis is that the gender diversity of the leadership influences the gender makeup of the programs they represent. To determine what factors influence gender representation within the specialty of emergency medicine, with the goal of better understanding of diversity and development of best practices for recruitment.

Methods: An IRB approved, retrospective, observational study of US Emergency Medicine programs for all residents of entering class years 2014-2017 was conducted using publicly available data for resident cohorts and program leadership to identify the study population, and data was confirmed by program leadership. Data was analyzed, examining program director's gender compared to the resident gender ratio to determine if there was a statistically significant relationship that existed. Secondary analysis of the distribution of gender by location was also performed.

Results: A population of 7236 residents in 170 programs was identified: 4635 male and 2601 female, giving an overall ratio of 1.78:1, with an individual program range of 0.50-6.67; 13 programs had a ratio ≤1. This distribution was consistent among program directors with a male-to-female ratio of 2.39:1. There was no statistically significant correlation between the program leadership gender compared to the individual program ratio(p=0.212). There was also no correlation noted between location and gender ratio found (p=0.675)

Conclusion: There are many factors that contribute to the makeup of the gender diversity within EM residencies, and although no direct correlation between program leadership gender and overall gender was elucidated, it still may play a role in the selection of the program by the individual, and further studies are currently being conducted to evaluate that role.

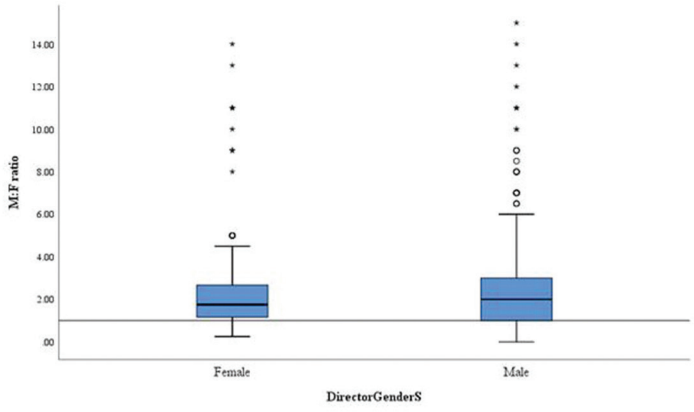


Image 1.

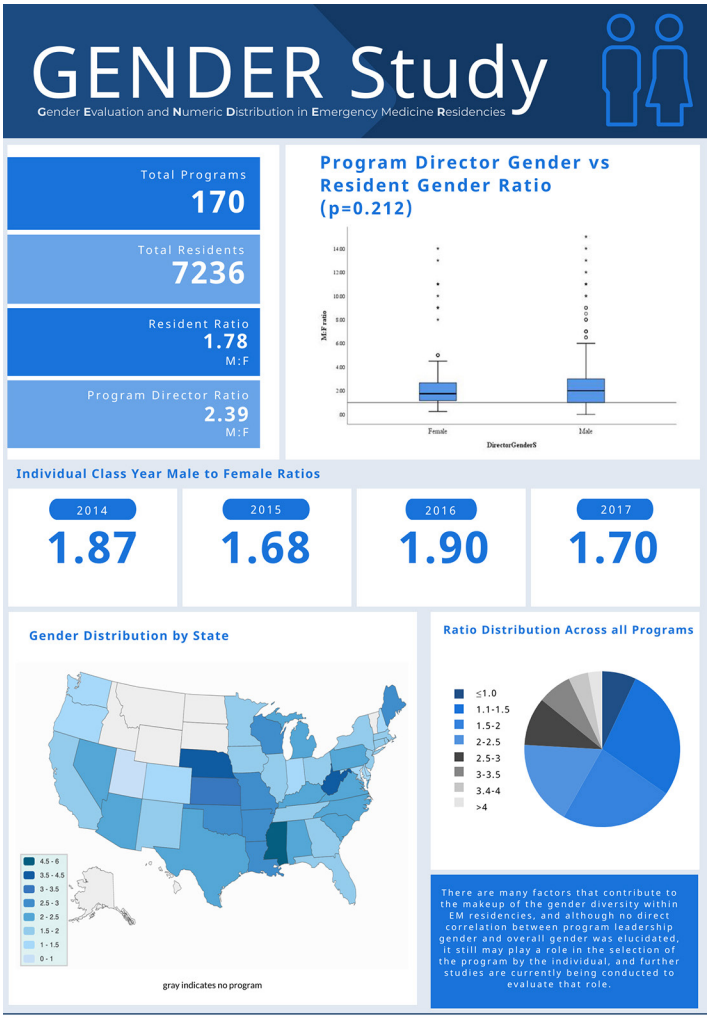


Image 2.

33 Geographic Trends in the Emergency Medicine Match

Kukulski P, Goode D, McEvoy B, Hay S, Ahn J / University of Chicago

Background: Application for EM residency is becoming more competitive. Knowledge about geographic trends in matched residents may help programs streamline their recruitment process. Studies in other specialties have shown a high correlation between residency and medical school location.

Objective: This study seeks to determine whether a correlation exists between the geographic location that an emergency medicine resident matched and their medical school location.

Methods: We identified allopathic emergency medicine residencies via The AMA FREIDA Residency Database. We used public websites created by residency programs to obtain individual demographic information.

Results: There are 164 Allopathic EM programs in the US with resident information available online, consisting of 5,903 residents. We found 5,617 residents with medical school information (95%) and 3,205 residents with undergraduate information (54%).

58.1% of residents train at a residency in the same census region as their medical school. This is not affected by gender (p=0.7). Residents with an advanced degree other than MD/DO are more likely to train in a different region than their medical school (p<.01).

Going to residency in the same region as one's medical school is associated with going to residency in the same region as one's undergraduate school (p<.001).

There are differences between regions as to whether residents stay in the same region as their medical school for residency (see Table 1).

Conclusions: This study demonstrates that a majority of EM residents train in a residency in the same region as their medical school and that going to medical school in the same region as one's undergraduate school predicts staying for residency. Gender does not affect these findings, but residents with another advanced degree are more likely to go to a new region for residency. This could be important information for both program directors and applicants in the recruitment process.

Table 1.

	Results by Region	
Region	Med School and Residency in Same Region	Med School and Residency in Different Region
Northeast	902 (55.6%)	719 (44.4%)
Midwest	903 (62.1%)	552 (37.9%)
South	1,111 (62.8%)	658 (37.2%)
West	346 (44.8%)	426 (55.2%)

34 High Efficiency Practices of Residents in an Academic Emergency Department: A Mixed Methods Study

Egan H, Bobb Swanson M, Ilko S, Pomeranz K, Harland K, Mohr N, Ahmed A / University of Iowa Hospital and Clinics

Background: ED utilization and overcrowding are on the rise, putting pressure on EM residency programs to train efficient residents who are able to meet these demands after training. Specific practices associated with resident efficiency have not yet been characterized.

Objective: The objective of this study was to identify specific, evidence-based practices associated with enhanced efficiency in emergency medicine residents.

Methods: A mixed-methods study design was utilized to identify behaviors associated with resident efficiency. Stage 1 Eight EM faculty provided 61 efficiency behaviors during semi-

structured interviews, which were distilled into eight behaviors by independent ranking. A total of 31 behaviors were tested, including additions from previous literature and the study team. Stage 2 Two 4-hour observations during separate shifts of 27 EM residents were performed to record minute-by-minute timing and frequency of each behavior. Stage 3 Association between resident efficiency and each of the behaviors was estimated using multivariable regression models adjusted for training year and clustered on resident. The primary efficiency outcome was 6-month average relative value units/hour. A sensitivity analysis was done using patients/hour.

Results: Seven practices were positively associated with efficiency: average patient load, taking history with nurse, running the board (#/hour), conversations with healthcare team (#/hour, % time), dictation use (#/hour, % time), text communication (#/hour, % time) and non-work tasks (#/hour). Three practices were negatively associated with efficiency: visits to patient room, conversations with staff physicians (% time) and reviewing electronic medical record (#/hour).

Conclusion: Several discrete behaviors were associated with enhanced resident efficiency. Results can be utilized by EM residency programs to improve resident education and inform evaluations by providing specific, evidence-based practices for residents to develop throughout training.

35 How Do Medical Students Decide to Use Their Time During Asynchronous Electives in the Residency Interview Season?

Jain A, Shamoon M, Diller D, Riddell J / LAC+USC Medical Center

Background: Medical schools have implemented asynchronous electives during peak residency interview months in response to students' frustrations with rigid course offerings during this time. While asynchronous education is gaining popularity due to its flexibility and appeal to millennial learners, little is known about learners' lived experiences and decisions about compliance during asynchronous electives.

Objective: We sought to explore how medical students make decisions about the use of their time when enrolled in an asynchronous learning elective during the residency interview season. Understand how senior medical students make decisions about the use of their time when enrolled in an asynchronous learning elective during the residency interview season.

Methods: We implemented a four-week elective for emergency medicine-bound fourth year medical students in November-December 2018. The weekly course structure consisted of four days of multimodal assigned asynchronous material and one day of on-site education. In April 2019, we conducted two one-hour semi-structured focus groups with course participants asking questions about the decisions students made regarding compliance with, and triage of, asynchronous assignments. Using elements of a constructivist grounded-theory approach, we performed thematic analysis of the transcripts. Four authors (AJ, MS, DD, JR) iteratively analyzed transcripts, organizing text into focused codes, conceptual categories, and major themes.

Results: Results of our thematic analysis are described with representative quotes in Tables 1 and 2.

Conclusion: Students' compliance with asynchronous assignments was enhanced by a desire for increased ownership of learning arising from a shifting professional identity. It was hindered by a lack of accountability for assignments, learner burnout, and higher prioritization of interviews. When triaging asynchronous material, students preferentially selected resources that were shorter in length, entertaining, more convenient for travel, and offered higher perceived educational value. In general, they gravitated towards podcasts and away from textbooks.

36 Impact of a Poverty Simulation on Resident and Medical Student Attitudes toward Poverty

Jurvis A, Zarzar R, Hart D / Hennepin Healthcare

Background: There is a growing recognition of the importance of integrating education on social determinants of health into medical education. The Community Action Poverty Simulation (CAPS) has been proposed as one innovative way to meet this need.

Objective: The purpose of this study is to assess the effects of a novel poverty simulation on the attitudes of residents and medical students toward underserved populations. Our hypothesis is that this simulation will have a positive effect on learners.

Methods: This mixed-methods study examined the implementation of a 4 hour CAPS with multidisciplinary residents and third-year medical students. Following the simulation, participants were surveyed on their reactions to the experience. A quantitative and qualitative analysis of these responses was performed. Pre- and post-simulation scores on the Attitude toward Poverty (ATP) Short Form were also collected. The cumulative scores were compared using a paired T-test to assess for changes in participants' attitudes towards poverty.

Results: 62 participants provided their reactions through the post-simulation survey, and 60 participants completed both the pre- and post-simulation ATP Short Form. 90% of participants felt that it helped them better understand their patient's poverty-related healthcare concerns and 84% of participants indicated that what they learned will influence their clinical practice. A preliminary qualitative analysis of responses demonstrated a positive change in many participants' attitudes towards those in poverty. Specific themes included an increased awareness of the challenges this population faces, an improved understanding of how poverty impacts the way patients interface with the healthcare system, and an increased awareness of how learners

can improve their interactions with this population. Comparing pre- and post-simulation ATP Short Form scores showed a trend towards improvement in attitudes towards poverty; however, analysis of cumulative scores did not show a statistically significant difference (p=0.084).

Conclusion: CAPS is an innovative way to integrate training on social determinants of health into medical education and may positively transform their attitudes toward poverty.

37 Incidence of and Factors Associated with Burnout in Incoming First Year Emergency Medicine Residents

McBride S, Brown H, Wagner E, Amber B, Seitz D, Stehman C / Department of Emergency Medicine, Indiana University School of Medicine, Indianapolis, IN

Background: Burnout is recognized as a problem in medicine, negatively affecting both physician wellbeing and patient care. Both medical students and EM residents suffer from burnout; however, the rate of burnout in incoming EM interns has not been described.

Objective: The aim of our investigation was to describe EM interns' demographic traits and incidence of burnout, and to identify characteristics associated with burnout.

Methods: In June 2019, we reached out to all ACGME EM program directors asking them to enter the email addresses of their incoming interns into a Qualtrics database. In July 2019, those interns were sent a survey containing questions assessing demographics, personal beliefs/habits, and scales evaluating mindset, imposter phenomenon and well-being. Investigators were blinded as to who received and responded to the survey. Data were analyzed via SPSS using descriptive statistics, regression models, and comparison of means.

Results: Emails were sent to 490 individuals with 125 responding at least partially, and complete data available for 114 respondents (23.2%). Table 1 details the respondents' demographics. Fifteen (13.2%) reported feeling burned out and/or met criteria for burnout based on the included scale. Among other factors, respondents with burnout were significantly more likely to identify as female (t=-2.56, p<0.05), feel like they don't get enough sleep (t=2.79, p<0.01), suffer from imposter symptoms (r=0.34, p<0.001) and be less excited about starting residency (F=4.29, p<0.01)

Conclusion: In this sample, new EM residents suffer from burnout at lower rates than those previously reported in residents of all levels. There are factors associated with burnout in this cohort which may provide targets for corrective intervention. Preventative intervention should be prioritized to maintain or even correct these relatively low burnout rates low throughout residency and beyond.

Table 1. Demographics.

Characteristic	N	(%)	High level of Burnout N=9
Age			
25-29	83	(66.4)	6
30-34	38	(30.4)	2
40-44	2	(1.6)	1
Gender			
Male	70	(56.0)	5
Female	53	(42.4)	4
Sexual Orientation			
Heterosexual	109	(87.2)	8
Homosexual	10	(8.0)	1
Bisexual	1	(0.8)	
Race			
White	99	(79.2)	6
Black	2	(1.6)	
Asian	11	(8.8)	1
Relationship status			
Married	44	(35.2)	4
Relationship (local)	26	(20.8)	4
Relationship (long distance)	22	(17.6)	1
Single	31	(24.8)	
Children			
Yes	18	(14.4)	2
No	105	(84.0)	7
Pets			
Yes	58	(46.4)	7
No	65	(52.0)	2
Roommates			
Yes	29	(23.2)	3
No	94	(75.2)	6
Debt			
None	18	(14.4)	1
Less than 100K	14	(11.2)	2
100k to 200k	18	(14.4)	1
200k to 300k	34	(27.2)	0
More than 300k	39	(31.2)	5
Degree			
MD in US	95	(76.0)	4
DO	25	(20.0)	4
MD outside US	3	(2.4)	1
Region			
Northeast (CT, MA, ME, NH, RI, VT)	11	(8.8)	
Midatlantic (NJ, NY, PA	11	(8.8)	
South Atlantic (DC, DE, FL, GA, MD, NC, SC, VA, WV)	15	(12.0)	
East North Central (IL, IN, MI, OH, WI)	39	(31.2)	
West North Central (IA, KS, MN, MO, ND, NE, SD)	9	(7.2)	
West South Central (AR, LA, OK, TX)	14	(11.2)	
Pacific (AK, CA, HI, OR, WA)	23	(18.4)	

38 Interprofessional Gender Bias During Emergency Medicine Residency Training

Cleveland Manchanda E, Chary A, Zanial N, Nadeau L, Shappell E, Macias Konstantopoulos W, Dobiesz V / Harvard Affiliated Emergency Medicine Residency, Boston, MA, Harvard Medical School, Department of Emergency Medicine, Massachusetts General Hospital, Boston, MA, Department of Emergency Medicine, Brigham and Women's Hospital, Boston, MA

Introduction: Gender disparities continue to persist within medicine. Adverse effects of gender bias are well documented, including among trainees in Emergency Medicine (EM). Recent studies demonstrate significant differences in the evaluation of female and male trainees with respect to milestone achievement during residency. This may be attributable to unconscious gender bias among educators. The extent to which gender-based discrimination occurs in the context of interprofessional interactions is not well understood. Of particular interest is extent to which this occurs between resident physicians and nurses.

Objective: This study aims to explore and understand perceptions and experiences of bias in the context of interprofessional relationships between Emergency Medicine residents and Emergency Department nurses.

Methods: We explored the way gender shapes interprofessional interactions in our EDs through structured interviews and focus groups with EM residents and ED nurses at our two main institutions. An additional component of this study is ongoing, and includes a survey administered to all EM trainees and nurses working in the EDs at Brigham and Women's and Massachusetts General Hospitals.

Results: Several key themes emerged from interviews and focus groups with female and male nurses and residents. Nearly all participants identified gender as an important factor in interprofessional working relationships in the ED. However, the degree to which gender influenced relationships differed between professions and genders. Table 1 illustrates the codes developed from analysis of qualitative data, as well as representative examples. Table 2 includes representative quotes.

Conclusions: Gender continues to play a significant role in shaping interprofessional interactions, including between trainees and nurses in the ED. Gender bias contributes to dissatisfaction in the workplace, the effects of which are felt by both male and female nurses and resident physicians.

Table 1. Codebook from qualitative interviews and focus groups.

Code	Examples
Differences in male vs female residents' interactions w/nurses	Nurses push back against female residents' orders Nurses offer help to male residents, but not females Nurses preferentially ask the male doctor (resident) about the plan instead of female resident or attending Men place orders and don't have to talk to nurses, whereas female residents place orders then go talk to nurses - otherwise plan won't get enacted Male residents talk down to nurses
Forming relationships	Social capital (example: nurses excited over male resident's baby, when a male resident brings cookies it's easier to curry favor with nurses than when a female resident brings food Intentionality about developing relationships – more recognition of need to maintain relationships among females
Difference between practice environments	More questioning of female residents at one facility than another
Change in relationships over time	Difference from intern year to senior year - stronger relationships and more dialogue over time
Allyship	Interviewee offers thoughts about how to be an ally to female residents
Conversations about gender bias with colleagues	Hesitance to discuss bias with male colleagues and superiors [female participants] Unsure how to best support/advocate for female colleagues [male participants]
Mechanisms for reporting gender bias	Safety reporting: seen as ineffective to solving issues of gender bias Discussion with leadership about gender bias felt to be ineffective
Suggestions for change	Decreasing salary gap at attending level Increased opportunities for communication between nurses and residents to foster shared understanding

Table 2. Representative quotes from study participants.

"The friendliness factor varies… I think men get a lot more leeway to try to be 'friends' with the nurses. And it doesn't damage their professional reputation." "Exactly. I think that it's because they can be friends, but in moments of leadership they can still be looked at as leaders, whereas **I think a lot of times the nurses don't necessarily see the women as leaders. They'll see them as peers.** Everything is a discussion and a conversation. Versus men are deferred to more. It's like, 'Oh of course. You're telling me to do this so even if I kind of question it I'm still going to do it,' because there's more trust in what the man is saying, what he's telling them to do." *-Female resident physicians*
"I think that male residents' orders are questioned less, their competence is questioned less." *-Male resident physician*
"Sometimes female residents, when they first start, try to assert themselves more because they're generally taken less serious by the male attendings or male residents, so I think that usually they start a little more hot-headed and then reel it in a little bit." *-Female nurse*
"[Male nurses] get taken more seriously and they're not questioned as much about things that they say or feel… If they said something or suggested something it was taken as the end-all be-all, and they weren't given as much of an argument.." *-Female nurse*
"I often struggle with what my role should be…as a cis gender white male…It's hard for me to know how to be an ally and support racial or ethnic minorities balanced with not wanting to strain the professional relationships you have with others as well." *-Male resident physician*

39 Lower-third SLOEs: Does Gender Make a Difference in Match Outcomes?

Kiefer C, Polinski R, Frauen H, Hansroth J, Angeline M, Davis K, Davis S, Quedado K, Shaver E / West Virginia University

Background: The Standardized Letter of Evaluation (SLOE) is consistently ranked as the most influential application component. Although recent literature has demonstrated superior performance from females compared to male counterparts on global assessment (GA) SLOE rankings, no prior work has studied gender influence amongst applicants with lower-third rankings and ultimate match outcome.

Objective: The purpose of this study was to determine whether gender influences the likelihood of not matching in those applicants receiving a SLOE with a lower-third GA. Our hypothesis was that females with a lower-third GA have a higher risk of not matching.

Methods: We conducted a retrospective cohort study evaluating Liaison Committee on Medical Education (LCME) applicants to a single EM residency program during the 2018 and 2019 match cycles. GA SLOE rankings and gender were extracted and correlated to the National Resident Matching Program (NRMP) data for each applicant. Comparative analyses were conducted between gender and SLOE groupings in order to obtain an odds ratio (OR) of gender and match outcomes.

Results: A total of 2,017 SLOEs were reviewed from 798 applicants. Overall, 716 applicants (90%) successfully matched into EM. A total of 277 (35%) applicants had at least one lower-third GA ranking. For all applicants, having at least one lower-third was associated with a significant risk of not matching (OR .20, 95% CI, 0.12-0.34). Of the 277, 85 of them (31%) were female and 192 (69%) were male. Of the applicants with a lower-third GA, 15 females (17%) and 39 males (20%) failed to match into EM. Gender was not associated with a significantly increased risk of not matching (OR 1.18, 95% CI, 0.61-2.21).

Conclusions: Female applicants receive a lower-third GA less frequently than male applicants. Although having a lower-third GA increases the risk of not matching in EM for all applicants, there appears to be no specific gender influence on match outcome

40 Manifestations of Second Victim Syndrome at an Academic Emergency Department

Vandivort C, Eng M, Kraut A, Sharp B / University of Wisconsin Department of Emergency Medicine

Background: Second Victim Syndrome (SVS) describes the suffering of caregivers involved in an adverse patient event. While ED providers are at high risk, relatively little work has been done to assess the prevalence of SVS amongst ED providers. Understanding the prevalence of SVS may be particularly important at academic institutions, where learners are at risk, may have limited skills in dealing with SVS, and may model behavior after affected faculty.

Objective: We sought to examine the incidence of second victim symptoms amongst our providers.Describe the prevalence and types of Second Victim Syndrome experiences and symptoms amongst MDs (attending, fellow, and resident) and advanced practice providers at an academic Emergency Department.

Methods: Physicians (attending, fellow, resident) and advanced practice providers (APPs) in the University of Wisconsin Department of Emergency Medicine were anonymously surveyed with two validated instruments, the Secondary Traumatic Stress Scale (STSS) and Second Victim Experience and Support Tool (SVEST).

Results: Survey response rate was 50.5% (52/103). Providers universally endorsed one or more symptom of SVS. From the STSS, most common symptoms included "easily annoyed" (87.5%), followed by "trouble concentrating" (83.3%) and "thinking about work when not intending to" (81.3%), while "avoiding people, places, or things that reminded me of my work" (29.2%) was least common. The SVEST similarly demonstrated ubiquitous symptoms with a similarly broad range of endorsements. 42.86% reported considering leaving their job and 38.1% considering taking a position outside of patient care. 4.88% reported taking time off and 11.9% taking a mental health day. 2.38% reported accessing support resources in the past 6 months.

Conclusion: Our results indicate symptoms of Second Victim Syndrome are prevalent in our department. Those affected infrequently access support resources. Reported rates of symptoms must be considered significant, particularly in the context of high burnout rates and non-clinical, academic stressors. These results point to the need for increased recognition of and support for SVS.

41 Massage Out Burnout

Shah S / Maimonides Medical Center

Background: Physician wellness leads to better patient care. However, many interventions offered to improve wellness take time and time is not something residents have much of. Massage therapy in the workplace is easily accessible and gives the doctor a chance to be taken care of: a momentary break from the role of caretaker. One study showed incorporating a 10 minute chair massage into nurses' shifts helped decrease their perception of stress moreso than a "coffee break", while another recognized the relation to patient care and provided massages to hematologists to help "recharge their batteries" and optimize the care they provided. Yet another study showed that massages provided during spa therapy for people of varying occupations improved symptoms of burnout.

Objective: We hope to demonstrate that massage therapy decreases burnout levels for emergency medicine resident physicians.

Methods: Our study employs a prospective cohort design. 47 EM residents at one program will participate over a 6-month period from October 2019 to April 2020. They will receive massage therapy via a massage chair while on shift. We will examine burnout using the Copenhagen Burnout Inventory (CBI). Residents will complete an initial baseline CBI survey, a repeat survey at the end of the initial 3-month massage period, and again at the end of the latter 3-month period of no massages.

Results: As our study is ongoing, there are no results as of yet. However, we do anticipate having preliminary results in time for presentation at CORD.

Conclusion: We expect that massage therapy will have a positive impact by decreasing burnout rates. Since there is little research regarding the impact of wellness interventions on EM residents, we hope that our work inspires more of this research and that it motivates other programs to institute similar wellness programs for their residents.

42 Medical Student Attitudes and Perceptions After Implementation of a Clerkship Evidence-Based Medicine Curriculum

Shaker L, Kenney A, Sena A, Moffett S / Rutgers New Jersey Medical School

Background: The Association of American Medical Colleges (AAMC) identifies incorporating evidence-based medicine (EBM) principles as a core entrustable professional activity for entering residency. In response to this direction, teaching of EBM has been integrated into undergraduate medical curriculum extensively, including the pre-clinical and clinical years. Studies assessing these curricula using validated tools have shown them to increase knowledge and improve critical appraisal skills. However, the majority of studies have focused on the effectiveness of teaching EBM to students in terms of knowledge and technical skills. An important potential barrier to the adoption of EBM includes attitudinal, perceptual and behavioral factors.

Objective: The overall aim of this study was to identify medical student perceptions on evidence based medicine prior to and after completing a structured EBM training program.

Methods: A structured "journal-club" style EBM training program in which students met weekly to critically appraise clinical articles was introduced into the curriculum of the fourth year emergency medicine clerkship for academic year 2018-2019. We developed a two part evaluation plan that included a 18 item voluntary survey questionnaire, administered pre- and post-clerkship, designed to evaluate attitudes and perceptions of medical students on the value of and barriers to an integrated EBM curriculum. Questions were taken from prior surveys studying EBM in medical trainees. Responses were anonymous and collected on a 5 point Likert scale. Data was analyzed using the Mann-Whitney U test.

Results: A total of 178 pre- and 144 post-clerkship responses were received. General attitudes towards EBM and the teaching intervention were positive. The intervention was associated with an increase in students' self-assessed skills and attitudes of all items and nine items were statistically significant ($p<0.05$, Figure 1).

Conclusion: Structured integration of EBM into the fourth year emergency medicine clerkship had a positive impact on student attitudes and perceptions, increasing interest in the topic and confidence in EBM skills.

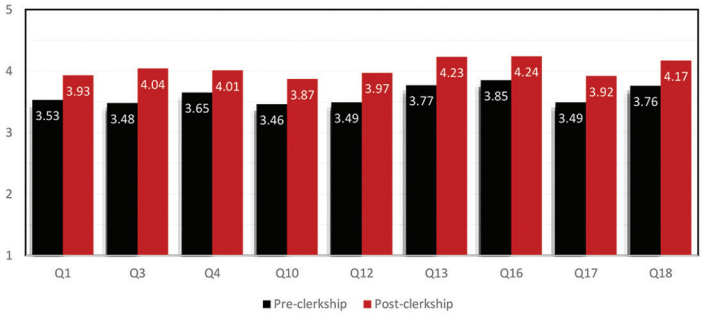


Figure 1. Statistically Significant Pre-Post Survey Questionnaire Responses.

Table 1. Pre- and Post- clerkship Survey Questionnaire.

Question Number	Item statement/question
1	I have the basic skills in appraising the medical literature
2	I know how to use information technology to access online medical literature.
3	I know how to apply what I find in the general medical literature to a specific patient
4	I use the medical literature to answer clinical questions
5	Journal club will change the way I manage patients
6	Journal club will help me feel up to date with the important literature
7	Journal club will increase my confidence when evaluating the medical literature
8	Journal club will increase my general medical knowledge
9	Journal club will increase my understanding of biostatistics
10	Attending journal club will motivate me to read more medical literature
11	The critical appraisal worksheet was useful
12	I was interested in the topic chosen for this journal club
13	Journal club is an improvement over just reading the articles myself
14	I read journal club articles prior to attending the meeting
15	Journal club is a good use of my time
16	Journal club should have attending physician involvement
17	Journal club will increase my sense of independence as a student
18	I think journal club should be implemented as a regular feature into the medical student curriculum

43 Qualitative Analysis of Emergency Medicine Resident Logged Patient Safety Observations

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Background: The Accreditation Council for Graduate Medical Education (ACGME) requires residencies to universally involve trainees in quality improvement (QI) and

patient safety (PS). Programs already track resident procedures.

Objective: To identify trends in resident recorded concerns about the clinical environment in the ED.

Methods: This study was conducted at a 4 year training program hosting 13 residents a year within a suburban health care system with two academic training sites. After IRB review, the residency procedure logging software New InnovationsTM was used to collect resident observations of their concerns in the ED. The Residency Steering Committee required 3 logs per 28 day ED rotation. Use of the formal institutional PS reporting system was noted via submission number. Logs contained the resident's observation, a suggested cause and a proposed countermeasure. Logs were reviewed qualitatively using methodology described by MacQueen et al and are analyzed descriptively.

Results: From 8/2016 through 5/2019 63 residents submitted 965 logs. Of these, 133 were PS reports, 6 were incomplete and 21 were deemed repeat submissions of the same event. The remaining 805 de-identified logs were reviewed and assigned to 1 of 19 themes each with sub-categories. Table One demonstrates this analysis. By PGY year, 1's most commonly submitted concerns with nursing, 2's issues with policies/ protocols, 3's behaviors and 4's triage issues. Notable were 24 logs from events outside the ED.

Conclusions: In this single site study of resident logs, it appears that required observations yields a variety of PS concerns. While the logs were a convenience sample, they can be used to inform future resident QI projects. With the submission of formal PS report numbers, the logs can document resident involvement in formal institutional PS systems. By submitting non-ED events, it appears the requirement contributed to a culture of PS.

Table 1. Qualitatively Analyzed Themes in Resident Patient Safetly Logs By Order of Frequency.

Theme	Log Count (Percent)
Nursing Practices	103 (12.8%)
Communication	95 (11.8%)
Equipment, Stocking	80 (9.9%)
Hallway Beds	70 (8.7%)
Hospital Systems	68 (8.4%)
Issues with Triage	51 (6.3%)
ED Policies, Administration	40 (5.0%)
ED Providers	38 (4.7%)
Laboratory Issues	38 (4.7%)
ED Throughput, Operations	37 (4.6%)
Professionalism	33 (4.1%)
Issues with the EMR	33 (4.1%)
Factors Outside the ED/Hospital	28 (3.5%)
ED Staffing Issues	27 (3.4%)
Issues with Security	19 (2.4%)
Registration Concerns	16 (2.0%)
Need for Further Staff Education	12 (1.5%)
Scheduled IT Software Downtime	10 (1.2%)
Sanitation	8 (1.0%)

44 Qualitative Feedback and a Revised AIR Score: An improved Quality Evaluation Tool for Online Educational Resources

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Background: Learners increasingly rely on online educational resources. However, most online resources lack peer-review, leading to concerns about content accuracy and quality. The Academic Life in Emergency Medicine Approved Instructional Resources (ALiEM AIR) score was developed for expert educators to appraise the quality of online educational resources and has demonstrated validity when used in this context.

Objective:

- We sought to evaluate the usability of the ALiEM AIR scoring tool among a diverse population of practicing physicians and medical trainees.
- We sought to use that qualitative feedback to improve the ALiEM AIR scoring tool.

Methods: As part of the larger METRIQ blog study, medical students, EM residents, and EM attendings used the ALiEM AIR score to assess 5 medical blog posts, after which they evaluated its usability, clarity of items, and the likelihood of recommending it to others via an online survey with free response items. Qualitative analysis using a thematic approach was performed by two independent analysts. Inter-rater agreement was 81.4%. Discrepancies were resolved through in-depth discussion and negotiated consensus.*

Results: Of 330 initially recruited, an international sample of 301 participants completed the ALiEM AIR Score evaluation. Results of qualitative analysis are shown in Table 1. Four major themes related to ease of use were identified including: clarity, logical structure, concise, and alignment with educational value. Major themes related to limitations of the tool included questionnaire best practices, validity concerns, and challenges assessing and limitations of evidence based medicine. Major themes in support of use included evaluative utility and usability.

Conclusions: While the ALiEM AIR score has numerous strengths, specific components require improvement to improve usability and utility.

*We are currently updating the AIR tool in response to the feedback.

Table 1. Results of Qualitative Analysis.

	Major Themes	Subthemes	Exemplar Quotes
Describe why the ALiEM AIR tool was easy to use	Clarity		"It gave relatively clear cut criteria for evaluating a blog post" "The ALiEM AIR Tool asked simple questions and offered simple responses"
	Logical Structure		"It contains logical questions that are easily applied to each resource." "I think the tool was fairly intuitive to use" "Overall questions were direct and easy to apply to blog posts"
	Concise		"Relatively short" "It was easy to use because it was short and concise"
	Alignment with educational value		"The questions are very relevant" "The tool is simple and hits on several major aspects of what makes a good quality blog post"
What was unclear about this these items?	Questionnaire best practices	Double barrelled questions Lack of written anchors for all response items	"Gaps in the anchors levels leave some level of interpretation which reduced utilization" "More than a few blog posts did not match with any of the answers because some were 'interesting' but not 'new', some were not 'new' but were definitely 'important'"
	Validity concerns	Score utility may vary according to purpose of the blog Score may vary depending on audience/learner level Score is dependent on assessor's knowledge and experience	"'Useful educational pearls for residents' is a little too subjective and the group is too broad. Perhaps stratifying by year? Interns, juniors, seniors?" "FOAM has been criticized for over-emphasizing sexy new topics and under-representing core concepts and this question could systematically down-rate important topics that are not strictly 'new'" "clinical pearls [was] challenging since I do not feel qualified to know whether the information presented would change current practice. I also did not feel qualified to comment on the key educational pearls with confidence...at this point in my training." "Regarding accuracy, I think this implies the reader of the blog has some previous knowledge which is often not the case, making it difficult at times to answer."
	Challenge assessing and limitations of evidence based medicine		"Just because it's "EBM" doesn't mean it's without bias." "It is very easy to appear to be practicing EBM but to do it badly."
Why would you recommend the ALiEM score for the evaluation of blog posts?	Evaluative utility		"It's more relevant and reflects usability better for clinical practice" "seems to encompass what I would care about in a blog" "Criteria used to rate the blogs are those that I feel are most important to establish valuable medical education sources"
	Usability		"Straightforward and easy to use" "It is a good and simple score to use"

45 Resident Appreciation of the Value of Teaching Faculty in Emergency Medicine Increases With Post-Graduate Year

Hill A, Papa L / Orlando Regional Medical Center

Objective: To evaluate emergency medicine resident perception of teaching faculty's value by post graduate year in a well-established emergency medicine residency program.

Methods: This study was retrospective review of faculty surveys collected over the course of nine years. This large well-established emergency medicine residency program is part of a tertiary care Level 1 trauma center. Annual faculty surveys were distributed to residents at the end of the academic year. Completion rates were 100%. Faculty were rated on a scale of 1 to 9 with 9 being the best overall score. Data are described using means with 95%CI's.

Results: Over the course of 9 years of evaluations, there were 8,797 resident-completed evaluations of teaching faculty; 3,066 were PGY-1, 3,039 were PGY-2, and 2,692 were PGY-3. The rating of "overall value to the emergency medicine program" increased significantly by PGY year with mean ratings of 8.08 (95%CI 8.04-8.12) for PGY-1s, 8.17 (95%CI 8.13-8.21) for PGY-2s, and 8.28 (95%CI 8.24-8.31) for PGY-3s. There were statistically significant differences between each PG year after controlling for multiple comparisons.

Conclusion: Resident appreciation of the value of teaching faculty in emergency medicine increases incrementally with each post-graduate year.

46 Resident Reporting of Mental Health Related Illness

Dichari E / University Of Nebraska Medicine

Background: Mental health-related issues are a growing concern in all areas of medicine, and recently there has been considerable interest in studying such issues. This has resulted in an interest to improve work-life balance and wellness for physicians, particularly during residency. However, our country continues to have residents in all specialties die every year from death by suicide. Previous literature has suggested that Emergency Medicine has one of the highest burnout rates of all specialties. The purpose of this study is to determine if a stigma exists regarding reporting of mental health-related issues to program directors in emergency medicine residency programs, and what barriers exist to reporting. We aim to identify the factors that can be addressed to allow residency program directors to cultivate a culture where reporting is something all residents feel comfortable with and are willing to do.

Objective: To determine if a negative stigma exists among emergency medicine residents regarding reporting mental health-related issues. If determined that a stigma does exist, we will evaluate the barriers to reporting such issues, as identified by resident respondents.

Methods: We will conduct a survey [Figure 1], which will be an observational cross sectional study concentrated on current emergency medicine residents as the cohort. It will be an anonymous survey. It will be distributed to numerous emergency medicine residency programs across the United States, based in both community hospitals and urban trauma centers. Any resident who is currently enrolled in one of the selected U.S. emergency medicine residency programs will be eligible to complete the survey. The survey will be distributed from November 2019 through January 2020 via email. It will be distributed a total three times, in order to optimize response to the survey. The principal investigator at the University of Nebraska emergency medicine program will then analyze the survey data, using appropriate statistical methods.

Results: [Forthcoming]

Conclusion: [Forthcoming]

Figure 1. Emergency Medicine Reporting of Mental Health Related Illness to Program Directors and Associated Program Directors.

1. Residency Program Name: _____
2. Is there a negative stigma attached by program administrators to residents with mental health related illness at your program?
☐ Yes
☐ No
3. Have you personally reported a mental health related illness to your program director or associated program director?
☐ No
4. If no, would you report depression to your program director or associated program director?
☐ Yes
☐ No
5. If no, then why not? (check all that apply)
☐ Fear of repercussion
☐ Fear of difficulties with licensure
☐ Fear of completing residency program
☐ Fear of getting stigmatized
☐ Fear of getting isolated from other residents
☐ Lack of confidence that program director or associated program director will be sympathetic to my problem
☐ Other_____
6. Have any residents in your program personally shared with you having faced difficulties after reporting a mental health related illness?
7. If yes, Please specify:
8. Is your residency program a supportive environment for residents with mental health related illness?
☐ Yes
☐ No
9. If yes, why so? _____
If no, why not? _____
10. Comments: _____

47 STEMI or Not STEMI: EKG Assessment and Screening Responsibilities Among Emergency Medicine Residency Programs

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Background: Rapid triage of electrocardiograms (EKG) for patients presenting with possible life threats is an integral skill to the practice of EM. Resident training in EKG interpretation is variable and no standardized measure of competence exists. It is unclear what autonomy EM residents are afforded in screening EKGs. Regardless of their residency experience, it is likely they will assume this role when they enter independent practice.

Objective: Assessment of current practices in formal assessment of resident EKG proficiency, EKG screening by residents in the ED, and self-reported resident confidence in screening life threats among EM residencies participating in Foundations of Emergency Medicine (FoEM), an open-access EM curriculum.

Methods: In June 2019, all registered FoEM site leaders and learners were asked to complete a web-based survey consisting of Likert scale and multiple choice items. Sites who reported nonuse or pilot-only use of FoEM content and those who registered after December 2018 were excluded. Survey items were piloted by the FoEM leadership team prior to survey administration. Descriptive statistics were reported.

Results: For the 2018-2019 year, 130 US and 5 international EM residency programs registered for FoEM. 105 programs were eligible to participate in this study. 99 (94%) site leaders and 1628 (54%) learners completed the surveys. Only a minority of leaders reported that their residents receive a formal assessment of EKG interpretation skill and a majority reported that their resident screened triage EKGs either with or without direct supervision (Table 1). Additionally, a significant minority of leaders reported that residents do not screen EKGs for life threats. The overwhelming majority of residents agreed or strongly agreed that they feel confident independently reviewing EKGs for life threats (Table 2).

Conclusions: Significant variability exists in the use of formal EKG assessment and resident EKG screening autonomy among participating residencies.

Table 1.

Leader Survey Responses			
Do your residents receive a formal assessment of their skills in interpreting EKGs?			
Yes	23.5% (n = 24)		
No	76.5% (n = 78)		
Do your residents screen EKGs for life threats? Life threats include STEMI, signs of ischemia, dangerous tachy/brady dysrhythmias, electrolyte disturbances, etc. Direct supervision means that residents either evaluate EKGs for life threats with attendings or immediately provide the EKGs to attendings for over-read.			
Yes - Without Direct Supervision	17.7% (n = 18)		
Yes - With Direct Supervision	59.8% (n = 61)		
No	22.5% (n = 23)		
	Formal Assessment	No Formal Assessment	
EKG Screen Without Direct Supervision	25.0% (n =6)	15% (n = 12)	
EKG Screen With Direct Supervision	54.2% (n =13)	62% (n = 48)	
No EKG Screen	20.8% (n =5)	23% (n = 18)	
Chi^2 = 1.16 Pr=0.557			

Table 2.

Resident Survey Responses					
I feel confident in my ability to independently review EKGs for life threats. Life threats include STEMI, signs of ischemia, dangerous tachy/brady dysrhythmias, electrolyte disturbances, etc.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
PGY1 (n = 608)	18.8%	63.2%	12.2%	5.1%	0.8%
PGY2 (n = 550)	30.2%	56.9%	10.0%	2.6%	0.4%
PGY3 (n = 385)	44.4%	49.9%	4.7%	0.8%	0.3%
PGY4 (n = 78)	53.9%	43.6%	2.6%	0.0%	0.0%
All Residents (n = 1,631)	30.4%	56.9%	9.3%	2.9%	0.5%
I feel confident in my ability to independently review EKGs for life threats.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
All Residents at sites with formal assessment (n = 297)	30.6%	54.8%	9.8%	4.3%	0.3%
All Residents at sites without formal assessment (n = 1334)	30.3%	57.3%	9.2%	2.6%	0.5%
Chi^2 = 3.06, Pr = 0.548					

48 Systematic Review of Pain Management Education in Graduate Medical Education

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Background: Pain is the most common presenting complaint to the ED; practitioners should therefore be experts in pain management. Pain control in the ED, however, is often inadequate and approached in a way that increases risk of dependence and contributes to the opioid epidemic. Given the complexity and discomfort with pain management in EM, improvements in graduate medical education (GME) on pain management are needed.

Objective: To evaluate the literature on educational interventions on acute and chronic non-cancer pain management implemented in all GME settings through a review of methodology and outcomes.

Methods: Following PRISMA guidelines, we conducted a systematic review by searching PubMed using variable keywords to identify studies on GME interventions on non-cancer pain control. Quality of study design and outcome measures were assessed with two valid, reliable tools: (1) Medical Education Research Study Quality Instrument (MERSQI), (2) Newcastle-Ottawa Scale–Education (NOS-E). Two independent coders rated all included studies using the MERSQI and NOS-E, with intra-class coefficients of 0.91 and 0.93 respectively.

Results: The original search yielded 5790 studies; 19 met inclusion criteria and were included in the final analysis. Interventions were conducted across many specialties; internal medicine represented the majority of study settings, while EM represented two. The mean MERSQI score was 12.1 (SD 2.01) of a maximum 18 and the mean NOS-E score was 2.89 (SD 1.24) of a maximum 6.

Conclusions: Studies on acute and chronic non-cancer pain management education in GME are few, with minimal conducted in EM settings. Overall, studies scored similarly to other research in GME on the MERSQI and NOS-E, suggesting average methodological quality. Future work in pain management education, especially in ED settings, should utilize more rigorous designs, incorporate multi-institutional sampling, and target learner behaviors and patient-centered outcomes.

Table 1.

MERSQI Domain	Response Item (points)	Number of Studies	Percentage
Study Design	Single-group cross-sectional or single group post-test only (1)	0	0%
	Single group pre- and post-test (1.5)	13	68.4%
	Nonrandomized, 2 group (2)	5	26.3%
	Randomized controlled trial (3)	1	5.3%
Sampling: institutions	1 institution (0.5)	17	89.5%
	2 institution (1)	1	5.3%
	3 or more (1.5)	1	5.3%
Sampling: response rate	NA (--)	5	26.3%
	<50% or not reported (0.5)	3	15.8%
	50-74% (1)	2	10.5%
	> 75% (1.5)	9	47.4%
Type of data	Assessment by study participant (1)	4	21.1%
	Objective (3)	15	78.9%
Validity evidence for instrument	NA (--)	5	26.3%
Content	Not present (0)	4	21.1%
	Present (1)	10	52.6%
Internal structure	Not present (0)	10	52.6%
	Present (1)	4	21.1%
Relationships to other variables	Not present (0)	12	63.2%
	Present (1)	2	10.5%
Data analysis: sophistication	Descriptive analysis (1)	2	10.5%
	Beyond descriptive (2)	17	89.5%
Data analysis: appropriate	Inappropriate (0)	0	0%
	Appropriate (1)	19	100%
Outcome	Satisfactions, attitudes, perceptions, opinions, general facts (1)	3	15.8%
	Knowledge, skills (1.5)	10	52.6%
	Behaviors (2)	4	21.1%
	Patient/healthcare outcome (3)	2	10.5%

Table 2.

NOS-E Domain	Response Item (points)	Number of Studies	Percentage
Representativeness of intervention group	Not representative (0)	6	31.6%
	Very or somewhat representative of the average learner in the community (1)	13	68.4%
Selection of comparison group	No separate comparison group or comparison drawn from different community (0)	15	78.9%
	Drawn from the same community (1)	4	21.1%
Comparability of comparison group	No separate comparison group (0)	13	68.4%
Nonrandomized (n=5)	Controlled for 1 subject characteristic (1)	5	26.3%
	Controlled for ≥2 subject characteristics (2)	0	0%
Randomized (n=1)	Allocation not concealed (1)	0	0%
	Allocation concealed (2)	1	5.3%
Study retention	Poor retention could introduce bias (0)	3	15.8%
	Retention unlikely to introduce bias (1)	16	84.2%
Blinding of assessment	Outcome assessment not blinded (0)	4	21.1%
	Outcome assessment blinded (1)	15	78.9%

49 The Carrot and the Stick: Utilizing an Incentive Based Program to Increase Resident Evaluation Completion in an Academic Emergency Department

Thompson M, Walter L, Khoury C, Edwards A / University of Alabama at Birmingham

Background: EM faculty evaluation of resident performance is a key element to track ACGME milestone progression during training. Obtaining a sufficient quantity of resident evaluation data is a challenge shared by many residency programs. Prior quality improvement projects have shown that policies penalizing faculty for failing to participate in resident evaluation ('the stick') result in increased compliance. To date there is a paucity of EM-specific research on the impact of incentive-based programs ('the carrot') for faculty with regards to resident evaluation completion.

Objectives: We hypothesize that a departmental policy both financially incentivizing EM faculty to complete resident evaluations as well as penalizing those who do not maintain a minimum number of evaluations per resident shift (EPRS) will lead to a increase in resident evaluation data. Methods: This stepwise departmental quality improvement project engaged 44 academic EM physicians who work regularly with 32 EM residents. The initial intervention was a financial incentive for faculty members who completed resident evaluations. This 'carrot' process was subsequently amended to include a 'stick' component- a minimum EPRS threshold required participate in a preexisting incentive program. Data displaying all EPRS information was provided at monthly meetings. Average EPRS information as well as number of resident evaluations completed per quarter were compared to the previous academic year. The objective of this study is to determine the effects of implementing a departmental policy both incentivizing faculty to complete resident evaluations as well as penalizing those who do not adequately participate in resident evaluation.

Results: During the first academic quarter of 2019, we found that our total number of evaluations increased 70% from 252 to 429 ($p<0.05$), while EPRS increased from 0.36 to 0.53 during the same time period. Conclusions: By utilizing departmental policies that provide a financial incentive as well as a concomitant potential penalty it is possible to drastically improve the number of faculty-completed resident evaluations and thereby, increase the amount of available data to track resident milestone progression.

Figure 1. Evaluations per resident shift by month.

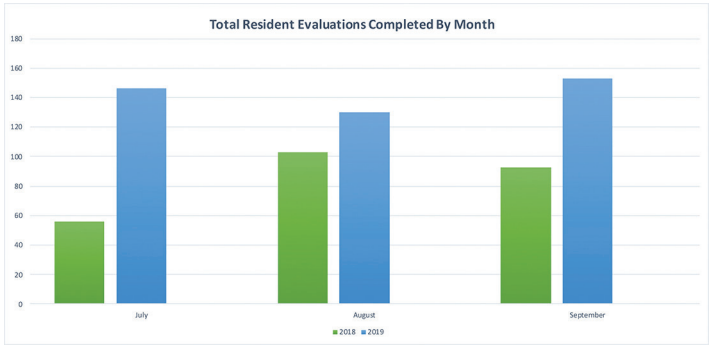


Figure 2. Total resident evaluations completed by month.

50 The Effect of QR Code Implementation on Resident Feedback in the Emergency Department

White J, Stowens J, Caplan R / Christiana Care Health System

Background: Feedback on resident performance is critical to resident graduate education. In the emergency department, many programs use daily paper "shift cards" as a method for feedback, although this has its limitations.

Objective: We hypothesized that creating a Quick Response (QR) electronic shift card system would yield improved feedback in both quality and quantity to paper shift cards. Upon reading this abstract, the reader would gain insight into an easy, innovative way to reduce the burden associated with collecting and documenting feedback while providing meaningful, constructive feedback that learners and educators prefer.

Methods: We compared the academic years before (2017-

2018) and after (2018-2019) introducing QR shift cards. We evaluated the number of shift card submissions and number of words per card. We utilized surveys of both residents and attendings to evaluate preferences and perceived quality.

Results: There was an increase in total shift card submissions with QR codes (2,817) compared to paper cards (2,600). There was no statistically significant difference in words per card (p=0.40), although the number of words per card varied more within the QR group (p<0.001) and had more cards with zero word count (18% vs 9%, p=0.01). 31/60 (52%) of residents and 37/71 (52%) of attendings responded to the survey. The majority of attendings (89%) and residents (65%) preferred QR codes, and a majority reported equal or greater satisfaction with quality and quantity of feedback.

Conclusion: Overall, the data suggests that implementing a new QR based electronic shift card feedback system may increase the number of shift card submitted and may not change the quantity of feedback on each card. The change was widely accepted by both attendings and residents in our emergency department.

51 Too Much on Their Plate? A Survey on Resident Multitasking in the Emergency Department

Abbas D, Turner-Lawrence D, Traylor S, Todd B / Beaumont Health System; Mount Carmel Health System

Background: The emergency department (ED) presents a challenging multitasking environment for emergency medicine (EM) trainees due to a large task load, limited clinical experience, frequent interruptions, and ED overcrowding. Multitasking has been associated with increased resident fatigue, physician burnout, and medical error. However, little is known about EM resident ability to multitask and its progression throughout training.

Objectives: We aimed to determine how EM residents are stressed by multitasking and how this changes throughout training. We hypothesized that early trainees would report greater multitasking difficulty than senior residents. At the conclusion of this activity, participants will be able to describe challenges posed by the ED environment on EM trainees and identify the trend of how ED multitasking progresses over the course of training.

Methods: We performed an observational, cross-sectional study investigating EM resident self-assessment of multitasking skills, stress associated with multitasking, and task management strategies. We administered a 5-point Likert scale survey anonymously to PGY1-3 residents at our large community teaching hospital.

Results: A 6 question survey completed by 34 residents was analyzed with one-way ANOVA with two-tail t-test (Fig 1). Residents reported improved ability to manage tasks efficiently (p=0.003) and decreased difficulty in prioritizing tasks (p=0.00004) from the PGY1 to PGY3 year. The feeling of being overwhelmed by tasks decreased as training progressed (p=0.00002). There was no significant difference found in the ability to leave shifts on time (p=0.09) or utilization of a task prioritization strategy (p=0.07), although these items trended towards improvement based on year of training. There was a trend for early learners believing they would benefit from a task management tool (p=0.1).

Conclusions: EM residents are stressed by multitasking, however this improves through training. Our study was limited by sample size at a single site. These results indicate that early learners in particular would benefit from education to improve multitasking.

52 Using Interprofessional Education to Improve Patient Safety Education Amongst Preclinical Medical Students

Andrabi S, Gill A, Huynh P, Hatfield C, Scheller S, Lye C / Baylor College of Medicine; University of Houston College of Pharmacy; Texas Woman's University

Background: Interprofessional education (IPE), collaboration, and communication are all important to EM. We created a Patient Safety, IPE activity in based around an EM clinical case. The activity was iteratively scaled-up, comprising of 118 pharmacy, 95 nursing and 180 medical students with 100 facilitators participating. Superlative evaluations revealed statistically significant student learning outcomes that we published in MedEdPORTAL. Successful learning activities are subject to degradation. Maintaining academic integrity and student satisfaction is a continual process that requires continual evaluation and intervention.

Objective: This study's purpose is to determine how medical, nursing and pharmacy students rate their satisfaction and self-efficacy before and after a required, IPE activity. We hypothesize that using multi-modal measures will help assess this. This also helps fulfill LCME accreditation standards.

Methods: Recruitment included experienced facilitators, housestaff, and providers. A facilitator orientation was provided. Students were assigned into proportionate groups of preclinical medical, nursing and pharmacy students and two facilitators consisting of a physician and either pharmacy or

nursing faculty. The learners work through a case requiring participation from all professionals to prevent a patient safety error. At closing, all learners complete an online survey rating self-efficacy pre and post activity. Facilitators attend a debrief to share experiences and provide feedback.

Results: 335/340 students completed the survey. All 8 objectives were statistically significant ($p < .001$) when analyzed using a Wilcoxon Signed-Rank test. Effect sizes were calculated to determine the magnitude of the increase. The highest effective size was 0.54 for the item, "I was able to recognize how others' skills and knowledge complement and overlap my own" and the lowest was 0.46 for, "I was able to include the patient/family in decision making." Typically, values in the range of 0.4 to 0.6 are considered moderate effect size, which is appropriate to the length of this intervention.

Conclusions: Using multi-modal measures to collect feedback from both learners and facilitators maintains academic integrity and can move the needle from good to great.

53 Utility of Amazon-Inspired Algorithm for Resident Procedure Logging

Bacharouch A, Goyal N / Department of Emergency Medicine, Henry Ford Health System, Detroit, Michigan

Background: Accurate procedure logs allow residents to demonstrate procedural competence and meet accreditation requirements. Residents often perform multiple procedures on the same patient but may only remember to log a single primary procedure. To mitigate this, Henry Ford Hospital Emergency Medicine (HFHEM) developed two logging tools that recommend additional procedures to record when a primary procedure is submitted. The first tool ("Website") provides suggested procedures based on a static linkage list predetermined by residency leadership. The second ("App") uses an Amazon-inspired algorithm to provide dynamic suggestions based on selection patterns of other residents. For example, the App would say "Residents who logged I&D frequently logged Local Anesthesia or Ultrasound" (Figure 1).

Objectives: To determine whether the dynamic algorithm leads to a greater frequency of procedure co-logging compared to the static linkage list. Secondarily, to determine whether such suggestions successfully prompt residents to log procedures which they may have otherwise forgotten when using traditional logging tools. To develop an innovative tool that would reduce the effort required by residents to log their procedures. To develop an algorithm that would improve the accuracy of the procedure record by capturing procedures that would potentially be forgotten if traditional logging tools were to be used.

Methods: Procedure logging data at HFHEM for academic year 2018-2019 were retrospectively analyzed. The rates at which residents co-logged 1, 2, or ≥3 procedures using the Website or the App were compared.

Results: 8,656 entries were logged: Website 6,804 (78.6%) and App 1,852 (21.4%). The App was superior to the Website in promoting procedure co-logging (Table 1). Overall, 34.8% of submissions had at least 2 procedures co-logged.

Conclusions: The Amazon-inspired algorithm improved procedure co-logging when compared to the residency leadership generated static list. Suggesting procedures (regardless of the algorithm used) led to a high rate of co-logging. This innovative algorithm may decrease the time needed to log procedures and may improve the accuracy of the record by capturing procedures potentially forgotten when using traditional logging tools.

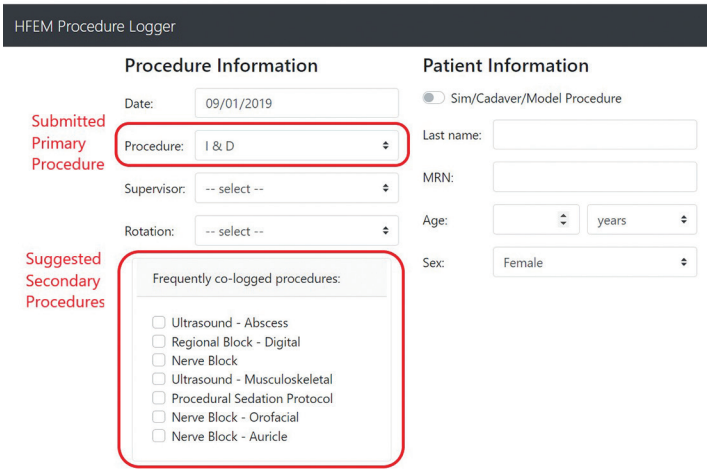


Figure 1. Procedure logging app example.

Table 1. Primary results.

Number of co-logged procedures	Website	App	p-value
1	4687 (68.9%)	957 (51.7%)	<0.001
2	1237 (18.2%)	588 (31.8%)	
≥3	880 (12.9%)	307 (16.6%)	
1	4687 (68.9%)	957 (51.7%)	<0.001
>1	2117 (31.1%)	895 (48.3%)	
1 or 2	5924 (87.1%)	1545 (83.4%)	<0.001
≥3	880 (12.9%)	307 (16.6%)	

54 Validity Evidence for the Core Physical Examination in Medical Students

Guth T, Yudowsky R, Park Y, Hanson J / University of Colorado, University of Illinois - Chicago, Washington University

Background: The Core Physical Exam (CPE) has been proposed as a basis for the Core + Cluster curriculum for teaching and assessing physical examination (PE) skills in medical students.

Objective: This study provides initial validity evidence for a modified, institution-specific CPE as an assessment of

PE skills in medical students. Validity investigation is the process of collecting and interpreting evidence to support decisions about assessments. Using conceptual frameworks for validity evidence, specific evidence for content, response process, internal structure, relationship to other variables and consequences was gathered.

Methods: The University of Colorado School of Medicine (UCSOM) CPE was developed as a 25-item version of the published CPE. Validity evidence for the UCSOM CPE was gathered using data from two classes of approximately 180 medical students from to September 2015 to December 2018. Validity evidence specific to content, response process, internal structure, relationship to other variables and consequences was gathered.

Results: Content and response process evidence was based on expert content expert of the UCSOM CPE and extensive rater training at the clinical performance center. High overall means of PE performance across the assessments suggest that students are able to perform recently learned PE skills in a clinical performance center assessment. (Table 1) Correlations of performance on the UCSOM CPE to other assessments of PE competence were generally low in the range of 0.14 to 0.23, consistent with correlations between stations of objective structured clinical examinations. (Table 2) The overall phi coefficient for the G study of 0.258 suggests low reliability for a single assessment. As the 90% pass-fail cut point determined by a modified Angoff approach resulted in a fail rate of 10% to 13% for the UCSOM CPE in first year and 36% to 38% in second year, clinical skills course directors selected a 80% pass-fail cut point as a defensible threshold for the UCSOM CPE for entry into supervised clinical practice.

Conclusion: Initial validity evidence supports the use of UCSOM CPE as a useful educational strategy for teaching physical examination and as a formative assessment of PE competence in medical students.

Table 1. Summary of UCSDM Clinical Skills Assessments Detailing Number of Core and Non-Core Physical Examination Items.

Sequence of Assess-ments	Exam Content	# UCSOM CPE Items	# Additional PE Items	Mean (SD)	
				Class of 2019	Class of 2020
M1-Fall: Systems*	Cluster 1			**92.5 (5.4)**	**89.9 (5.2)**
	- Head and Neck	6	14		
	- Pulmonary	4	8		
	- Upper Musculoskeletal	1	16		
	Total	**11**	**38**		
	Cluster 2				
	- Abdominal	4	10		
	- Cardiovascular	7	6		
	- Lower Musculoskeletal	1	18		
	Total	**12**	**34**		
M1-Spring: CPE	Comprehensive Medical Encounter: UCSOM CPE items only[a]	**25**	**0**	**94.8 (5.6)**	**95.7 (4.8)**
M2-Fall: Neuro	Focused Medical Encounter: Neurologic Body System PE items only[a]	**0**	**15**	**95.6 (4.6)**	**91.4 (7.5)**
M2-Spring: CPE	Comprehensive Medical Encounter: UCSOM CPE items only; additional abdominal PE items not included in analysis[a]	**25**	**0**	**90.3 (7.5)**	**91.2 (7.9)**
M3-Spring:[b] OSCE	Ten Focused Medical Encounters: Various UCSOM PE items and Additional Items	**13**	**16**	**68.1 (9.1)**	**Not available**

Notes:
* Students are tested on either Cluster 1 or Cluster 2 (3 out of 6 body systems) for the M1 Fall Systems assessment.
[a] Same for classes of 2019 and 2020
[b] Data available for Class of 2019 only

Table 2. Relationships to Other Variables: Spearman Correlations Between Assessments for the Physical Examination Assessments by Class.

Class of 2019	M1-Fall: Systems	M1-Spring: CPE	M2-Fall: Neuro	M2-Spring: CPE
M1-Fall: Systems N=182				
M1-Spring: CPE N=181	0.14 P=.05 179			
M2-Fall: Neuro N=181	0.16 P=.03 179	0.08 P=.28 179		
M2-Spring: CPE N=180	0.20 P<.01 175	.13 P=.08 176	0.20 P<.01 177	
M3-Spring: OSCE N=173	0.20 P=.02 150	0.22 P<.01 150	0.08 P=.31 150	0.08 P=.40 147
Class of 2020	M1-Fall: Systems	M1-Spring: CPE	M2-Fall: Neuro	
M1-Fall: Systems N=184				
M1-Spring: CPE N=183	0.14 P=.05 183			
M2-Fall: Neuro N=184	0.12 P=.11 183	0.18 P=.06 183		
M2-Spring: CPE N=184	0.16 P=.03 183	.23 P<.01 183	0.34 P<.01 184	

Note: Associated p values and numbers of students included in the correlations are included below the correlation.

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

Kukulski P, Ahn J / University of Chicago

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

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

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

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

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

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

Innovations Abstracts

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

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

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

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

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

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

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

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

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

Koutsoubis A, Fishbein E, White J / Sidney Kimmel Medical College at Thomas Jefferson University

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

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

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

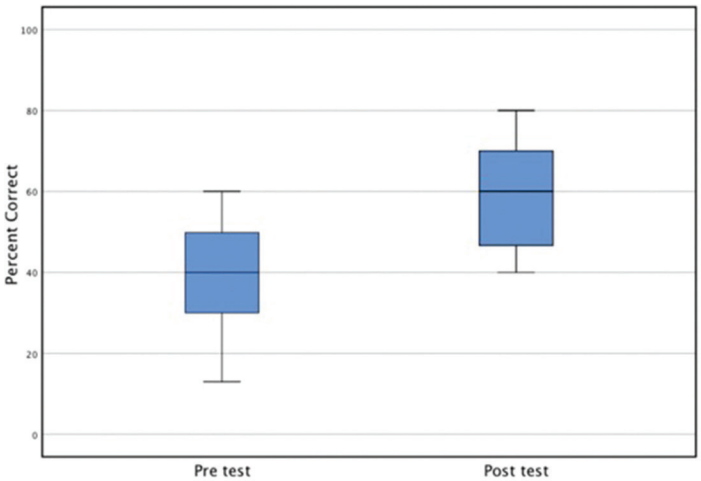


Figure 1. Boxplot showing median percent on the pre test completed before the module and on the post test after completing the module.

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

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

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

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

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

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

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

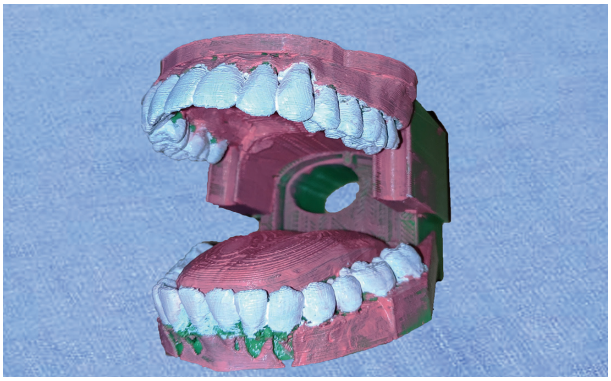


Image 1.

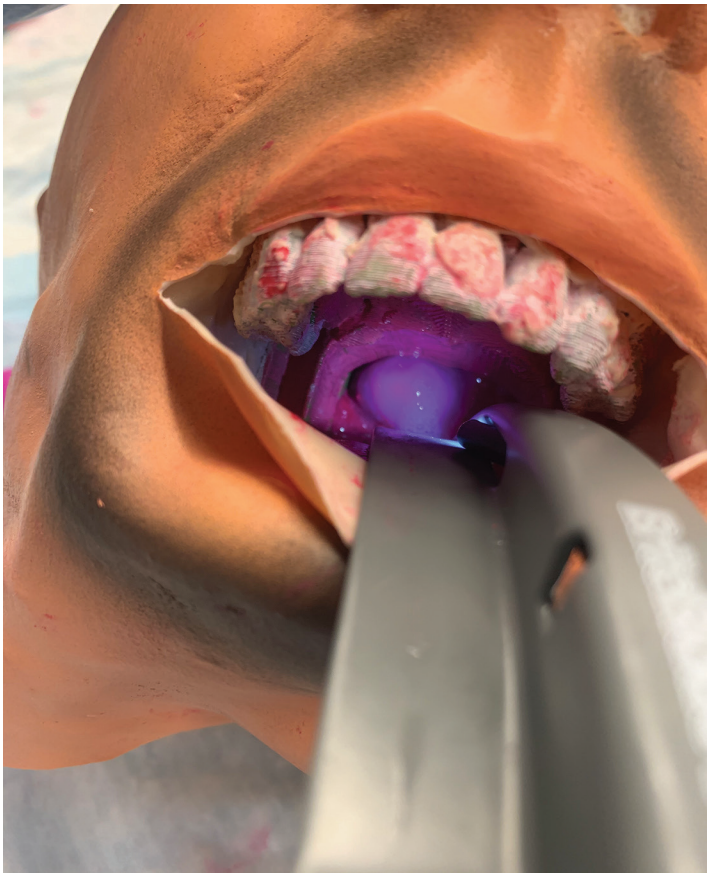


Image 2.

4 A Novel approach to Neonatal Resuscitation Education for Senior Emergency Medicine (EM) Residents

Buchanan J, McCormick T, Roosevelt G, Sungar W, Angerhofer C, Byyny R, Moreira M / Denver Health Medical Center; Denver Health and Hospital Authority

Introduction: Caring for critically ill children, and in particular neonates, is a low-frequency and high-stakes scenario; EM physicians must be facile in the management of these stressful cases. Most emergency medicine training focuses on experience in pediatric ICUs, neonatal ICUs or the resuscitations that occur in the ED. We describe a novel approach to EM resident training that specifically augments skills in neonatal resuscitation.

Educational Objective: Our educational objective was to design a rotation focused on training in and exposure to neonatal resuscitation. During this novel rotation, senior EM residents attend emergent deliveries and resuscitations in the hospital as part of the neonatal resuscitation team.

Curricular Design: Prior to this week rotation, residents received training from a pediatric ED nurse educator and pediatric EM attending in neonatal resuscitation and obtain Neonatal Resuscitation Program (NRP) certification. The residents attend and participate in all deliveries in the hospital. They also participate in the obstetric, PICU, and NICU rounds and may assist with procedures in those units. At rotation end, residents give a short presentation on a neonatal resuscitation topic. On rotation completion, they are expected to set-up a neonatal resuscitation, lead the team through the NRP resuscitation, and care for the critically ill newborn in the first minutes after birth.

Impact: After implementation during the 2018-2019 year we compared the rotation's mean score by senior residents to all other off-service rotations (1-lowest and 4-highest). The mean score of the neonatal resuscitation rotation was 3.67 (95% CI; 3.49-3.84), compared to 3.00 (95% CI; 2.84-3.16) for all other off-service rotations, the highest ranked senior rotation. Programs should consider implementing a directed neonatal resuscitation experience for EM residents given the critical and high risk nature of caring for this low frequency population.

5 A Novel Curriculum In Free Open Access Medical Education (FOAM) Utilization and Evaluation For Emergency Medicine Residents

Fisher K, Turner A, Pillow T / Baylor College of Medicine, Baylor College of Medicine

Objective: Implement a novel curriculum for resident physicians to obtain critical evaluation skills for FOAM resources

1) Define FOAM, its impact and utility 2) Use tools for evaluation and 3) Implement these skills to apply FOAM sources in didactic learning and real-time clinical applications

Abstract: Free open access medical education (FOAM) resources are ubiquitous and frequently utilized in Emergency Medicine (EM). EM residents regularly use FOAM sources for on-shift clinical application and didactic learning without the necessary training or tools to critically analyze their variable quality and utility. Though FOAM has been used and studied for content delivery, no formal curriculum exists to our knowledge to teach evidence-based evaluation of FOAM sources. We present the first, formal didactic curriculum on critical evaluation and application of FOAM sources for Emergency Medicine residents.

The goal of our curriculum is to focus on the process of utilizing FOAM rather than the content itself. The curriculum consists of an innovative, structured series of small group didactic sessions each relating to a core component of FOAM utilization and evaluation in real-time using evidence-based principles (Table 1). Sessions were designed following elements of problem-based and team-based learning in a small-group, active learning setting and include preparation, a short didactic component, an interactive exercise and a group discussion. Each session focuses on a core concept in FOAM utilization and evaluation in stepwise fashion using an emerging clinical content area as a concrete example (Table 2). All sessions include

pre- and post-surveys as assessments of content acquisition and session effectiveness.

This curriculum has been piloted at our institution with success. Residents unanimously expressed satisfaction with the session format, felt more comfortable using FOAM sources clinically in real-time, and expressed desire for further knowledge in the area.

Immediate next steps include completion of our institutional pilot and development of a summative tool to be used clinically to demonstrate effectiveness and application of the FOAM curriculum. Long term, we plan to expand our innovative curriculum and add assessments to measure its effectiveness.

Table 1. Instructional Design: Session Topics and Goals.

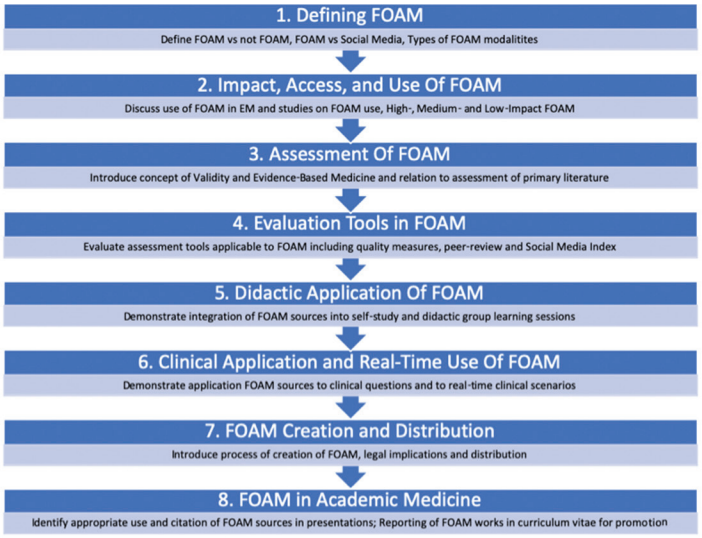
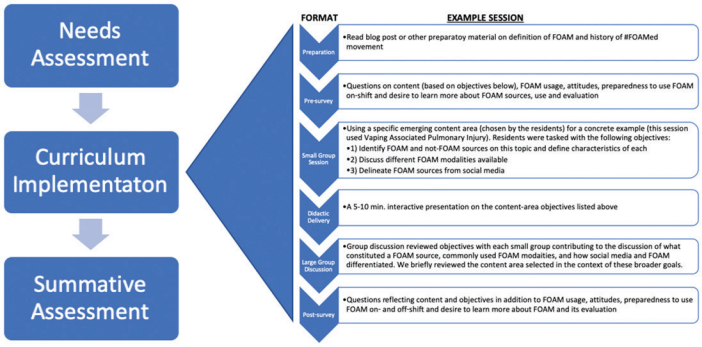


Table 2. Curriculum Design and Sample Session Format.



6 A Residency Driven Emergency Medicine Wellness Initiative

Robak M, Romeo M, Worthing J, Tsao J / NYU/Bellevue Emergency Medicine

Introduction: Burnout has become widely prevalent and has been linked to physicians leaving the workforce, reduced patient satisfaction, and medical errors. EM residents are at particularly high risk. To combat this issue, the NYU/Bellevue EM Residency program formed a task force with the mission of creating a culture that promotes individual and group wellbeing as well as nurturing workplace enjoyment, creating outlets for stress mitigation, and allowing a forum to bring co-workers together to cultivate a community through new relationships, collegiality, and peer support.

Objectives: The task force proposed the creation of a Residency Wellness Committee that was approved and is now fully funded by the Emergency Department with a budget of $24,00 annually. The Committee's goals include: transformation of attitudes towards mental health, enhancing self-awareness and reflection, personal growth and emotional support. Enhancing resident wellness by transforming attitudes towards mental health, enhancing self-awareness and reflection, promoting personal growth and providing emotional support

Design: Within the hospital, the Committee promotes multiple ongoing endeavors. These include Project SafeSpace, closed-door meetings between mental health professionals and residents; Resiliency Round, a series of didactic sessions focused on mindfulness techniques; the Exceptional Events Reporting system, a system to highlight excellent resident medical care; and the Peer Support Network, a multi-disciplinary group of providers trained in supporting practitioners after psychologically taxing cases.

Beyond the hospital, the Wellness Committee strives to provide an outlet for mental and physical health as well as community-building, including monthly fitness and cultural events, as well as seasonal outings to take advantage of the region.

Impact: The Wellness Committee surveyed physicians within the ED on the impact of the wellness committee. 87% of respondents either strongly agreed or agreed has improved residency wellness. Qualitative feedback was also overwhelmingly positive, largely expressing appreciation of the Committee's efforts.

7 A Simulation-Based Program of Assessment for Emergency Medicine Milestones

Leung C, Yee J / Ohio State University

Background: EM residency programs are required to report milestone levels for all residents biannually, though there is no consensus on the best methods for assessing milestones. Traditional methods of assessing clinical competence are often confounded by variability of patient presentations and the clinical environment. Assessing management of critically ill patients may also be hindered by infrequent incidence of pathology. High fidelity simulation may overcome these issues by offering highly reproducible

scenarios in a standardized clinical setting.

Educational Objective: To develop a longitudinal program for assessment of EM Milestones in residents using high fidelity simulation. To describe the development of a longitudinal program for assessment of EM Milestones in residents using high fidelity simulation.

Curricular Design: Residents participate in two simulation assessments per year. In each session, residents concurrently manage three patients with different clinical scenarios which have been developed to allow assessment of specific EM Milestones. A checklist of milestone-based behavioral anchors is utilized to determine proficiency levels for patient care milestones specific to each case. After each simulation session, a report is generated for each resident that details the milestone levels attained based on the behavioral anchors (Figure 1). Milestones are tracked throughout the duration of the program.

Impact: Two classes of residents (34 total) have participated in the simulation program. Levels were assigned for patient care milestones 1-9, 11, and 13. Most residents attained milestone levels appropriate for level of training. Although additional analysis is still needed to validate these assessments for milestone reporting, the information in the milestone reports has already made a big impact on our trainees. Analysis of aggregate data has identified areas for curricular improvement to share with residency leadership. Individual residents have been able to identify deficiencies during the simulations and have used the reports as a stimulus for performance improvement.

Table 1.

Resident	Brutus Buckeye		
Cases	1) ovarian torsion, 2) abscess with cellulitis, 3) concussion	Individual	Program
Patient	Item (milestone level)	completed	% completed
#1	Recognizes abnormal VS (1.1)	Y	100%
	Performs a primary assessment (prioritizes essential elements of H&P) on a critically ill patient (1.2, 2.3)	Y	92%
	Consult obgyn (1.3)	Y	91%
	Orders a transvaginal ultrasound (3.2)	Y	95%
	Created a Ddx that is prioritzed by likelihood and included appropriate emergent diagnoses (4.2)	Y	94%
	Asked medication allergies (5.1)	N	46%
	Administers analgesia (5.2, 5.3, 11.2)	N	84%
	Re-evalutes patient, monitors that interventions are performed, evaluates effectiveness of therapies (6.1, 6.2, 6.3)	Y	87%
	Admits patient to appropriate level of care (operating room) (7.3)	Y	87%
	Manages a single patient amidst distractions (8.1)	Y	100%
	Effectively task switches between different patients (8.2)	Y	88%
#2	Performs a focused H&P which effectively addresses the chief complaint (2.2)	Y	94%
	Orders appropriate diagnostic studies (bedside ultrasound) (3.2)	Y	88%
	Describes I&D technique (9.2)	Y	100%
	Asked medication allergies (5.1)	N	52%
	Selects correct medication accounting for allergies (5.2)	Y	76%
	Discharges patient with appropriate return precautions (7.3)	Y	67%
	Gives instructions for outpatient follow up (7.2)	Y	88%
#3	Performs a focused H&P which effectively addresses the chief complaint (2.2)	Y	65%
	Practices cost effective use of diagnostic studies (3.3)	Y	71%
	Asked medication allergies (5.1)	N	56%
	Selects correct medication accounting for allergies (5.2)	Y	87%
	Discharges patient with appropriate return precautions (7.3)	Y	94%
	Gives instructions for outpatient follow up (7.2)	Y	53%
	COMMENTS: Brutus appropriately recognized concern for ovarian torsion, but was slow to order appropriate diagnostic testing and GYN consult. The dose of morphine ordered was not adequate to provide sufficient pain control. He consistently forgot to ask allergies prior to ordering medications. The Ddx was well prioritized and included appropriate emergent diagnoses. Brutus gave excellent return precautions to both discharged patients.		

8 Advancing Communication Excellence at Stanford (ACES) Emergency Medicine Residency: A Curriculum for Interns

Alvarez A, Kline M, Passaglia J, Weimer-Elder B / Stanford Emergency Medicine Residency; Stanford University Hospital

Background: With a strategic focus of developing a relationship-centered culture, the EM residency leadership, EM interns and the Physician Partnership Team in Patient Experience designed an innovative pilot using formative and summative evaluation to identify how best to deliver knowledge, and practice 3 relationship-centered communication (RCC) skills. A series of 4 workshops and individualized coaching observations were part of the design. We proposed a curriculum for EM interns focusing on relationship-centered care using the Advancing Communication Excellence at Stanford (ACES) initially designed for Stanford faculty.

Objective: The primary objective was to learn how best to engage EM interns to learn and adopt the 3 foundational RCC ACES skills. The second objective was to design a reproducible EM RCC curriculum within the residency program based on time constraints and entry-level cognitive demands.

Curricular Design: We developed a curriculum for EM interns, supplemented by individualized-coaching and asynchronous learning using the flipped-classroom model. We used intern-driven scenarios and role-playing techniques to demonstrate and emphasize key communication skills. We used online surveys and text check-ins to assess the effectiveness and further iterate this learner-centered curriculum. The first 3 sessions included a reflection and check-in, demonstration of a skillset and small group practice with an ACES coach. Bedside clinical EM coaching was scheduled with each intern between sessions 3 and 4. Session 4 will integrate all 3 skills with Standardized Patients and will be recorded and used in the final coaching session.

Impact/Effectiveness: We have successfully integrated the RCC into the EM intern curriculum over 3 in-person, 60-90 minute workshop sessions and individualized clinical coaching. The impact will be assessed through a learner self-assessment and coaching assessment. We plan to scale this to the entire EM residency.

9 An Eye Model for Practicing Ocular Exam Skills

Kim E, Humphries R / University of Kentucky

Introduction/ Background: Intraocular pressure is a critical part of the eye exam in diagnosing ocular emergencies such as

acute angle-closure glaucoma. Differences in intraocular pressure measurements may result from true variability (diurnal variation, disease progression) or from inaccurate testing (uncalibrated device, user error). Our goal is to help practitioners minimize user error by presenting a relatively life-like eye model that learners may practice various parts of an ocular exam, including measuring intraocular pressure, foreign body removal, and basic slit lamp exam skills.

Objective: Our objective is to provide learners with an eye model that can be used to practice measuring intraocular pressure, ocular foreign body removal, and basic slit lamp exam skills.

Curricular Design: An educational conference was held for emergency medicine residents on eye exam skills. Through the use of our model, we learned that residents were making common mistakes including incorrect positioning when using the Tono-Pen and inappropriate patient globe compression. Additionally, many residents lacked experience or confidence with ocular foreign body removal with a small-gauge needle and slit lamp exam skills. We designed this simple eye model at our institution using inexpensive materials such as a Styrofoam head, a hard-boiled egg, and a contact lens to help providers learn how to use a Tono-Pen correctly as well as practice with foreign body removal and slit lamp exam techniques.

Impact/Effectiveness: New practitioners often feel uncomfortable with performing ocular exams on real-life patients. On reflection, we believe our eye model helped our residents develop confidence and effective ocular exam skills. Our innovation can easily be applied at other institutions to help others develop these skills on an eye model before practicing on actual patients.

Image 1.

10 An Innovative Approach to Teaching Residents about Charting and Billing

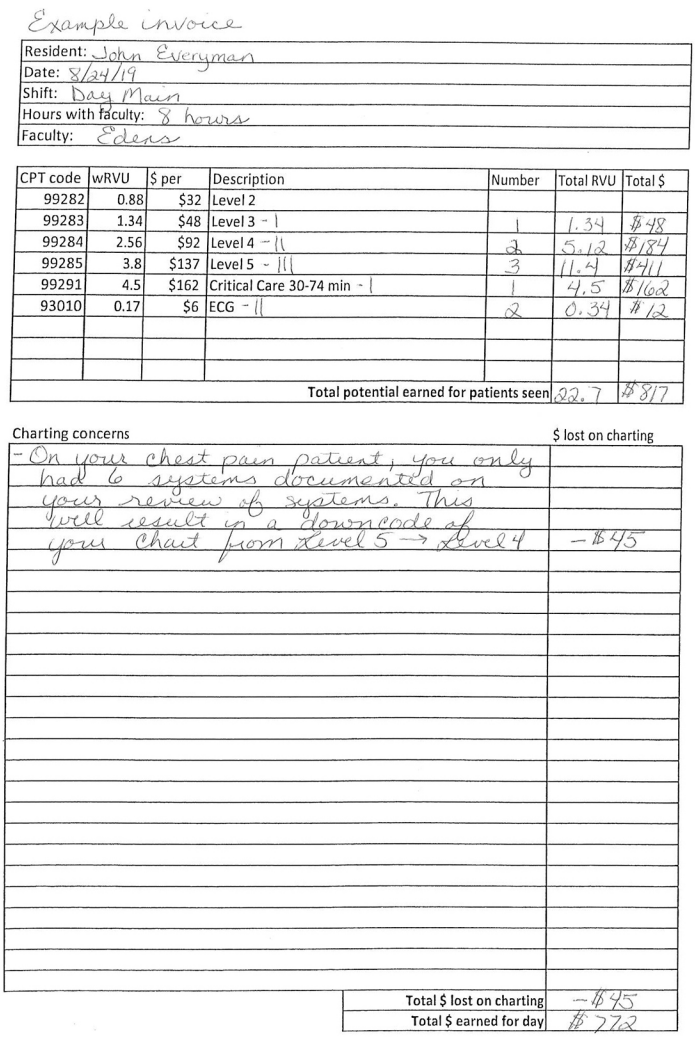
Edens M, Hutchinson K / Louisiana State University HSC, Shreveport

Background: It is incumbent on residency programs to teach residents about the administrative aspects of Emergency Medicine. This includes information on charting and billing. Like most Emergency Medicine residency programs, our program had a well-established curriculum to teach charting. However, what we were lacking was a way to teach residents how their charting relates to billing in a way that was meaningful to them.

Learning Objective: The objective of this innovation is to identify gaps in knowledge regarding documentation, billing and reimbursement and to determine if said gaps can be filled with innovative "invoice education"

Curricular Design: After every shift, as I am cosigning the resident's charts, I will keep track of what each patient's charge should be based on the chief complaint, presentation, work-up and ED course. I will also record detailed feedback to the resident regarding how any of their charting could result in a "down code" of the charge. These will be recorded on a form that we are calling an "invoice". The residents will then be given this "invoice" detailing "How much money they could have made" based on the patients seen with me during the shift, as well as "How much money they would have lost" based on their charting mistakes. This puts the feedback into a perspective that is meaningful to the residents – MONEY.

Impact/Effectiveness: After the innovation had been implemented for approximately 6 months, the residents were surveyed regarding whether they felt the innovation helped them understand, charting, billing and reimbursement better. 27 of 34 residents answered the survey. 100% of residents answering the survey felt either very satisfied or satisfied that the innovation helped them understand aspects of good charting practices and how charting relates to billing. 96% of residents answering the survey felt either very satisfied or satisfied that the innovation helped them understand principles of reimbursement. We are currently reviewing the "invoices" to determine if certain types of charting errors were able to be decreased through this simple intervention.



Example invoice

Resident:	John Everyman
Date:	8/24/19
Shift:	Day Main
Hours with faculty:	8 hours
Faculty:	Edens

CPT code	wRVU	$ per	Description	Number	Total RVU	Total $
99282	0.88	$32	Level 2			
99283	1.34	$48	Level 3 - I	1	1.34	$48
99284	2.56	$92	Level 4 - II	2	5.12	$184
99285	3.8	$137	Level 5 - III	3	11.4	$411
99291	4.5	$162	Critical Care 30-74 min - I	1	4.5	$162
93010	0.17	$6	ECG - II	2	0.34	$12
			Total potential earned for patients seen		22.7	$817

Charting concerns	$ lost on charting
- On your chest pain patient, you only had 6 systems documented on your review of systems. This will result in a downcode of your chart from Level 5 → Level 4	-$45
Total $ lost on charting	-$45
Total $ earned for day	$772

Image 1.

11 Development of a Medical Education Scholarship Track Within A Residency Career Enrichment Program

Caretta-Weyer H / Stanford University

Introduction: Many residents identify an interest in medical education during residency. Several programs have developed concentrations or tracks to address these interests. However, medical education is becoming increasingly challenging secondary to the growing complexity of practice and the expanding roles within this domain ranging from clinical teacher, to educational administrator, to clinician educator, or even education researcher.

Learning Objective: We sought to design and implement an education scholarship track within our residency career enrichment program spanning all four years of training to address the full range of roles and allow our residents the opportunity to develop a scholarly niche within medical education.

Curricular Design: Following Kern's model for curriculum development, we performed a literature review and utilized published models for education scholarship fellowships as a guide. We performed a targeted needs assessment of our residents regarding their interests within medical education. As part of the needs assessment, residents wanted to ensure that there was room for individualization within the curriculum such that they could tailor the track to their interests. The needs assessments provided the following topics for inclusion in the medical education scholarship track: resident as teacher, education theory, presentation skills, small group facilitation, team-based and problem-based learning, curriculum development, assessment, competency-based medical education, program evaluation, education research methods, survey development, study design, manuscript writing, grant writing, and peer review. Goals and objectives were developed for each course.

Impact: Eight residents have joined the education scholarship track since its inception. Each resident has chosen a different route based upon his or her interests. Several have focused on clinical teaching while others have focused on areas within the clinician educator niche such as curriculum development and assessment. Two residents have pursued education research projects, one focusing on qualitative methods to investigate psychological safety in feedback and the other focusing on resident communication with patients. Both will be submitted for publication upon completion.

12 Disaster Preparedness Training in Emergency Medicine Residents Using a Tabletop Exercise

Sena A, Forde F, Masters M / Rutgers New Jersey Medical School; University of Cincinnati College of Medicine

Learning Objective: To expose emergency medicine residents to principles of disaster preparedness and allow them to practice the principles in a simulated setting.

Abstract: Emergency medicine (EM) physicians serve at the frontline during disasters within our communities, events increasingly on the rise. The 2016 Model of Clinical Practice of Emergency Medicine identifies the importance of the EM physician's ability to practice mass casualty/disaster management including the principles of preparedness, triage, mitigation, response and recovery. We describe an affordable and feasible way to implement such training for EM residents. This tabletop drill was developed with the objectives to expose residents to concepts in mass casualty incidents such as START triage, incident command system, and surge capacity. The drill took place during two hours of resident didactic time. A brief lecture introduced the incident command system and triage concepts. This was followed by a tabletop scenario with a map of a disaster scene or emergency department. Questions and tasks prompted residents to prepare for the influx of

patients, triage numerous patients (presented on index cards), and allocate limited resources appropriately using the map. The scenario concluded with a debrief and a second lecture reviewing specific topics and challenges from the scenario. Residents took an online pre- and post-assessment which demonstrated a statistically significant increase in confidence levels in disaster preparedness following the exercise. There exists a gap in disaster medicine training, likely resulting from variability of education and emphasis in program curricula. Residents need a platform to practice disaster preparedness in a simulated setting, however large scale disaster drills can be challenging to implement as they require manpower, materials, facilities and time. The simplicity of this exercise allows it to be adapted for various scenarios and individual emergency departments as it was most recently used in Ghana. This exercise is a feasible option for introduction to disaster preparedness training.

13 Electronic Order Entry in Medical Simulation

Milman B, Gentges J, Nanavaty V / University of Oklahoma Health Sciences Center

Background: Medical simulation plays an integral role in emergency medicine resident education. Learners report that as the realism of medical simulation increases, they are more motivated to participate in simulation. Simulation centers are now able to present patients at a remarkable level of fidelity, but high fidelity diagnostic reporting is not available. Labs and imaging results are often read aloud by a moderator or printed paper results are handed to the learner.

Objectives: Our goal was to develop an EMR-like program that allows participants in simulation the ability to interactively order labs and imaging and display results.

- Demonstrate a low-cost, realistic EMR that can be used for simulation and oral boards cases in resident and medical student education
- Discuss how this can be easily replicated by other programs and at other facilities

Curricular Design: We designed a PowerPoint based interactive application that mirrors the EMR that our program uses in the emergency department at our primary clinical site. This is a no-cost, highly-realistic order-entry system that can be used during simulation sessions. A screenshot of the Epic orders page that we use clinically is the basis for this design. Hyperlinks allow learners to interact with the orders page. Learners initially click one of the outlined boxes seen in Figure 1, which fills in the box. Clicking a shaded box will bring the learner to a hyperlinked page with the results of that test. When creating a case for simulation, abnormal values are input by an instructor. During a simulation, learners use a bedside computer to order labs, imaging, and review results.

Impact/Effectiveness: Using this platform to order and view labs adds an element of realism that did not previously exist in our simulations. As the simulated environment more effectively mirrors the clinical environment, learner comfort, decision making, and diagnostic ability all improve. The platform is also useful in oral board training. This no-cost tool has increased the authenticity of our simulations. Further quantitative research using this tool is proceeding.

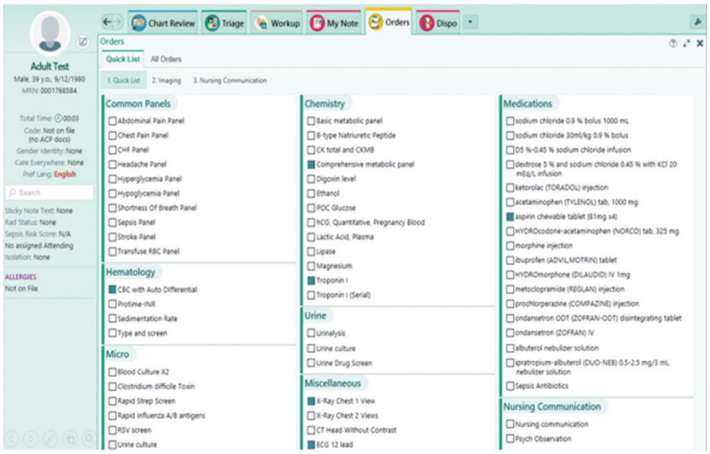


Figure 1. Screenshop of order entry system used in simulation

14 EscapED: A Medical Escape Room as a Novel Approach in Emergency Medicine Medical Education

Schwartz K, Kahl N, Oyama L / University of California, San Diego

Introduction/Background: Emergency medicine (EM) requires multi-tasking, team coordination, and rapid recall of extensive medical knowledge. The California American College of Emergency Physicians (CalACEP) annual conference encourages medical students and residents to hone EM skills in a novel educational environment.

Educational Objectives: To reinforce EM knowledge and professional skills in a fun, team-based, "escape room" style game.

Curricular Design: EscapED, a medical escape room, reinforced essential EM material, including clinical acumen, procedures, communication, and professionalism. Teams of residents or medical students performed in groups of 6-8. Several clinical stations culminated in the final stage, a riddle that could only be solved with clues from successful completion of each station. Given the conference's proximity to Disneyland, EscapED was inspired by Disney characters and well known superheroes. Stations included mass casualty triage of injured Storm Troopers, management of former Mouseketeer child stars with wayward adult toxicologic presentations, diagnosis and treatment of a Frozen character's hypothermia, and a cypher decoding rabies treatment for

monkey bite. Necessary skills included ECG/radiograph interpretation, visual diagnosis, and common procedures. Gamification allowed participants to demonstrate puzzle-solving skills and teamwork. Teaching points were provided via QR code upon exiting the escape room.

Impact/Effectiveness: Competitive events reinforce core knowledge and build teamwork essential to EM. Anonymous feedback was overwhelmingly positive; the event was perceived as "extremely" or "very" engaging and effective. Feedback included enjoyment of the novel teaching tool and reinforcement of intellectually stimulating content, and recognition of improvement from the prior year's Escape Room. Future events will focus on puzzles contributing to the escape and emphasis on functional communication.

15 Extinguishing Burnout Before It Happens: Measuring the Impact of an Executive Coaching Program on a Cohort of Emergency Medicine Junior Faculty

Papanagnou D, McKnight R, White J, O'Connell A, Brader T, Tomaselli P, Crossman M, Sielicki A, Bradley C, Naples R / Thomas Jefferson University

Introduction: Despite increasing prevalence of burnout in EM physicians, few solutions to address the epidemic have been offered. Studied extensively in psychology, coaching can mitigate burnout. Specifically, coaching improves self-awareness, self-regulation, empathy, and engagement. To date, there are no studies that measure the impact of coaching on EM physician wellbeing.

Objectives: Our goal is to assess executive coaching's impact on junior EM faculty. Specifically, the innovation aims to: 1) examine the feasibility of a coaching program for a cohort of junior faculty; 2) measure the impact of coaching on resilience; 3) detect changes in specific emotional intelligence competencies, before and after the program; and 4) identify factors that support productive coaching relationships from focus groups.

1. Examine the feasibility of a coaching program for a cohort of junior EM faculty;
2. Measure the impact of coaching on resilience;
3. Detect changes in specific emotional intelligence competencies, before and after the program;
4. Identify factors that support productive coaching relationships.

Design: Junior faculty (<5 years out of residency) from an urban, academic, level-1 Department of EM (DEM) were solicited to participate in a yearlong executive coaching program, launched in November 2019. Fourteen from 18 potential junior faculty self-enrolled. In an effort to collaboratively address the burnout epidemic, the DEM developed an academic, non-financial relationship with a head coach to secure 14 seasoned, volunteer coaches to serve each of the faculty. Coaches have begun meeting with faculty for monthly 1.5-hour sessions, using several personal assessments as vehicles for reflection. Faculty completed a monthly Connor-Davidson Resilience Scale to detect changes in resilience; the Emotional Quotient Inventory, administered at the start / end of the program; and the Hogan and DISC Personality Inventories. The program will conclude with focus groups to qualitatively identify themes that support coaching.

Impact: Our faculty coaching program represents a first initiative to prospectively measure the impact of executive coaching on indices predictive of burnout. Aggregated data will inform recommendations that can be applied to residents.

16 Global EM Without Boarding a Flight: A Novel Trans-National Educational Partnership in International EM

Mahendru N, Hankin Wei A / Reading Hospital Tower Health, Emory University Hospital

Introduction: Many residents and residency programs – in the US and abroad – have an interest in including a global EM component to their curriculum. However, in many cases, these opportunities are only available to a small number of residents due to funding constraints, travel costs, health/safety concerns, and family responsibilities. For residencies overseas, in addition to aforementioned constraints, there are difficulties with visas and credentialing challenges. We present a novel and productive collaboration between an EM residency in Pennsylvania and one in Mozambique to engage in shared teaching and scholarly collaboration to meet a need identified by the Mozambican residents.

Learning Objective:

1. Engage in shared case discussions to learn management of complex EM patients in diverse clinical settings
2. Collaborate to create an educational newsletter for generalist physicians in Mozambique
3. Identify key EM skills for trauma and airway skills that are transferrable to low-resource setting

Curricular Design: The residency leadership of the two partner residencies – in Pennsylvania and Mozambique – worked together to identify shared goals and objectives. After this, the two residency programs hosted a shared case conference via a video meeting platform to share clinical and educational experiences. Then, an email was sent to residents of both programs seeking volunteers to work collaboratively on development of newsletter articles for Mozambican general physicians. Three teams of two residents each were paired – each containing a Mozambican and American resident – and worked together to draft the article on locally-relevant and resource-appropriate topics.

Impact: This project resulted in the creation of the inaugural national newsletter of the first Mozambican EM Residency. This was an innovative partnership between two

EM residencies in two very different clinical settings which allowed them each to learn about the others' setting while working together as colleagues and collaborators. Such a partnership serves as a role model for other EM residencies that want to make Global EM opportunities more broadly accessible.

17 Heads Up! A Novel Activity for Resident Conference

Fujimoto J, Roepke C, Chen E / UCSF Fresno; Lewis Katz School of Medicine at Temple University

Background: As medical education increasingly incorporates adult learning theory and small group activities in resident conference in lieu of lectures, program leadership are tasked with both finding faculty time to lead small group exercises, in addition to developing curriculum for the sessions.

Educational Objectives: We created a "Heads Up!" style game to teach core content topics in Emergency Medicine (EM). We aimed to design a resident conference activity that is both engaging and educational to prepare for the upcoming in-training exam.

After review of the pre-conference materials, learners will apply their knowledge of Dermatology and Infectious Disease by giving each other clues in the game.

(We created this game focusing on the topics of Derm and ID, so our learning objective reflect this specific content.)

Curricular Design: In this flipped classroom activity, a designated resident facilitator selected FOAM resources for learners to review in preparation. The facilitator created digital cards featuring a visual diagnosis using the "Studies" app.

At conference, residents were split into groups of approximately 10 each. One resident (Player 1) was it instructed to start gameplay by holding an iPad on his/her forehead, displaying the image to the group, held so that he/she is unable to see the image. The other residents in the group gave Player 1 clues to prompt correct identification of disease. Once the correct diagnosis was guessed by Player 1, the facilitator asked the whole group another question related to disease. The player who answered correctly became Player 1.

Impact: Residents were asked to fill out a survey after the activity. Eleven of 30 participating residents completed the survey. One hundred percent of survey responses rated the activity as "informative and engaging." One resident called the activity an "excellent review." Another stated "I loved the heads up game!!"

This game was a well-received, engaging tool to teach core content EM in resident conference. With movement towards small group learning in lieu of lecture format, it is difficult to find activities that are valuable, but not resource-intensive. This activity strikes that balance and could be incorporated at any EM residency.

18 HIGH STAKES: Teaching Medical Students to Recognise and Manage Common Emergencies in Namibia

Nagji A, Bigham B, Hunter C, Bana R, Theune S, Jazuli F, Shaikh S / McMaster University, University of Namibia

Learning Objective: To develop a five-day acute resuscitation course for senior medical students in sub-Saharan Africa covering emergencies in surgery, internal medicine, obstetrics, gynaecology, psychiatry, paediatrics, and crisis communication.

Abstract: The University of Namibia Medical school (UNAM) & McMaster University have a longstanding partnership for curricular co-development. UNAM did not have a formal emergency medicine curriculum for medical students. We conducted a needs assessment by reviewing the literature for causes of morbidity and mortality that are amenable to emergency care in Namibia and engaged local consultants and department heads to develop a consensus curriculum that focused around a 1 week 'High Stakes' course for 5th year Namibian medical students. Topics include: trauma, altered mental status, dyspnea, shock, snake bite and dangerous fever. Forty-nine students attended. Each participant was exposed to 10 hours of lecture, 8 skill stations, 12 small group sessions, and 32 low-fidelity simulations. Students were exposed to content with spaced repetition: lecture, clinical cases then simulations which gradually integrated concepts and increased in complexity over the week. We used focus groups and surveys to understand impact. Twenty-seven completed the survey and 14 attended focus groups. All rated the course highly and stated it would change their behavior. Some cited they saved lives while working evening shifts in the hospital after just a few days of attending the course. The course has now been vertically integrated into the curriculum with additional priming lectures added in previous years, follow up OSCE stations for assessment and a 6th year resuscitation course that builds on content learned. The course will be repeated in January 2020 with the goal of building a standardized, portable curriculum applicable to other schools in sub-saharan Africa.

19 How to Run a (Quick Response) Code: Increasing and Streamlining Medical Student Evaluations

Koning M, Cheng A / MetroHealth Medical Center, Department of Emergency Medicine, Case Western Reserve University School of Medicine

Introduction: Obtaining timely, accurate, and evaluator-friendly feedback for students is a vital part of medical education. Paper evaluations are easy to use, but can be lost, illegible, or turned in after feedback could have been impactful or grades due. To combat this, we added a Quick

Response (QR) code to our paper forms that linked directly to an online form with the same content. Scant research exists in implementing QR codes in medical education, and none exists regarding EM education.

Educational Objectives: Our goals were to increase the number of evaluations completed per student, make student evaluations more user-friendly, easier to translate into grade forms and Standardized Letters of Evaluation, and increase the timeliness of evaluation submission for student feedback.

Our goals were to increase the number of evaluations completed per student, make student evaluations more user-friendly, easier to translate into grade forms and Standardized Letters of Evaluation, and increase the timeliness of evaluation submission for student feedback.

Curricular Design: Our paper evaluation forms were updated with a QR code at the end of 2018. At the start of each 2019 rotation, we posted the student names, pictures, and the QR code around the department in addition to encouraging students to hand out paper evaluation forms with the QR code on shift. We encouraged them to use the evaluation method they preferred. We calculated the number of evaluations completed per student per 4-week block in 2018, and then again in 2019 after introducing the QR code.

Impact: The addition of a QR code was associated with an increase in our per-student evaluation average from 6.8 to 8.8, 43% of which used the QR code. This 29% increase in evaluations compared to last year is worth the addition of this tool and was well received and well utilized by our department. We anticipate this method could be used to generate evaluations in graduate as well as undergraduate medical education.

20 ICU Bootcamp: Using Online Micro Lectures to Teach Critical Care

Yamane D, Siddiqui S, Kazzi M / The George Washington University

Objectives: Our objectives are to provide out of classroom online educational videos for residents prior to their ICU rotations, to teach core critical care education and fundamental medical knowledge underlying common medications and disease processes, and to teach evidence-based medicine.

Abstract: Residents are required to work in the ICU setting during their first year of residency. The ability to learn fundamental critical care concepts outside the classroom prior to ICU rotations builds residents' confidence and allows them to perform clinically with a stronger knowledge base. Currently, critical care online education targeted specifically to PGY1 level residents is sparse and lacking. We sought to fill this gap in graduate medical education with our innovative online video course.

Our Program Director, two Critical Care trained Emergency Medicine faculty, and one PGY4 Emergency Medicine resident identified gaps in the critical care education and sought to address them. We developed these objectives: provide all PGY1 residents exposure to critical care concepts prior to ICU rotations; provide out of classroom learning and resources accessible at any time or place. Our course is a collection of video lectures that meet these goals. Each video is 5-10 minutes long and can be viewed at multiple speed options at the resident's convenience. We teach in a "chalk talk" style, drawing out disease or drug mechanisms to help learners clearly visualize concepts. Videos are presented in a stepwise fashion, so prior concepts can be built upon later. We include evidence-based medicine by reviewing literature within lectures. Topics covered in our PGY-1 course include: diabetic ketoacidosis, vasopressor selection, shock, sepsis, arterial blood gas analysis, sedative selection, ventilator overview, non-invasive ventilation, and ARDS.

Our innovative education provides learners with an easy and effective way to learn critical care outside the classroom and hospital to prepare specifically for their role in the ICU as PGY1 residents. To date, there is no specific targeted online curriculum available for residents to prepare them for their critical care rotations. We have implemented our idea by posting videos online on YouTube.com and our website, icubootcamp.io.

21 Impactful Mentoring: a Novel Multi-Modality Short-Burst Approach to Mentoring Visiting Sub-Interns

Bralow L, Cloyd T, Makker T, St. George J / New York Presbyterian Hospital; Columbia University

Background: As educators, we must also embrace the importance of mentorship to students to support professional development, clinical excellence, wellness and scholarship. The sub-internship in emergency medicine is uniquely positioned to impact students from a wide range of schools over a short amount of time when students are entering a period of accelerated personal and professional growth while preparing for residency.

Objectives: We believe that impactful, efficacious mentoring can be successfully implemented within the one month sub-internship rotation. To analyze current mentorship practices in our sub-internship and develop and implement a high-impact, easily accessible mentorship system for our visiting students.

Design: A novel mentoring structure was created using a review of primary literature and group consensus from leaders in sub-intern education in our department. We developed and implemented a three-pronged system aimed at maximizing impact, availability and convenience (figure). Clinical advisers are education faculty tasked with mid-rotation performance feedback based upon shift evaluation data. Each student-adviser pair also has a shift together for hands-on mentoring.Niche mentors are self-identified faculty who were paired with students based upon entry survey data. These faculty provide advice for

pursuing the student's interest during residency. Based upon exit survey data, engagement ranged from a coffeehouse chat to formal involvement in scholarly projects. Sub-I leadership provide weekly open forum tele-mentoring. Students mostly sought advice on the residency application process and interview season. In the coming year, we plan to structure tele-mentoring sessions around hot-button topics such as putting your best self forward, the personal statement, and how to succeed on interview day.

Impact: This novel three-pronged approach to student mentorship was highly appreciated by students in its first year of implementation. Our current model provides a framework for further exploration of how a multi-faceted mentoring approach can have a high-yield impact over a short, one month sub-internship.

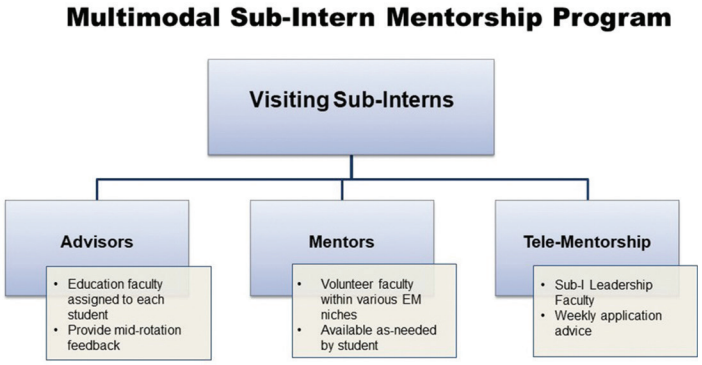


Figure 1. Outline of novel three-pronged high-impact mentorship structure for visiting sub-interns.

22 Impacting Care of Opioid Use Disorder in the Emergency Department Through Resident Education

Marshall A, D'Orazio J, Healy M, Malik S / Temple University

Background: More than 47,000 people died of opioid overdose in the United States in 2017. Emergency physicians are on the front line of this epidemic and must be prepared to manage many aspects of opioid use disorder (OUD). Training residents to recognize and treat OUD is a critical step in addressing this crisis, however we currently lack effective curricula.

Educational Objectives: To improve treatment of patients with opioid use disorder by incorporating targeted education for emergency medicine residents into existing didactics. Specific goals included training residents in 1) initiating medication assisted therapy (MAT) and 2) managing acute complications of OUD.

1) Describe the need for an effective opioid use disorder (OUD) curriculum in emergency medicine didactics;
2) Identify core content for OUD lectures;
3) Describe the impact of a formal OUD curriculum; and
4) Provide an implementation plan for launching an OUD curriculum at your institution.

Curricular Design: We developed three hours of core OUD lecture content that we are currently delivering as part of our program's 18-month didactic schedule. Specific topics include: 1) epidemiology and psychosocial context of OUD including risk factors for and identification of OUD in the ED; 2) management of acute overdose; 3) management of withdrawal and stabilization using MAT; 4) initiation of MAT and warm handoff of discharged patients; 5) initiation of MAT for admitted patients; and 6) management of complications resulting from injection drug use. Teaching points are reinforced via direct patient care and on-shift instruction. Program evaluation is comprised of feedback solicited at each lecture and formal surveys to be administered at the conclusion of the curriculum.

Impact/ Effectiveness: We launched the OUD curriculum alongside enhanced pathways for ED-based OUD treatment in September 2018. During initial ad hoc feedback sessions, residents reported increased comfort with initiating MAT, treating opioid overdose and medical management of OUD during acute illness. This curriculum can be easily applied at other academic emergency departments to improve treatment pathways for patients with OUD. Results from formal feedback surveys will be analyzed in January 2020.

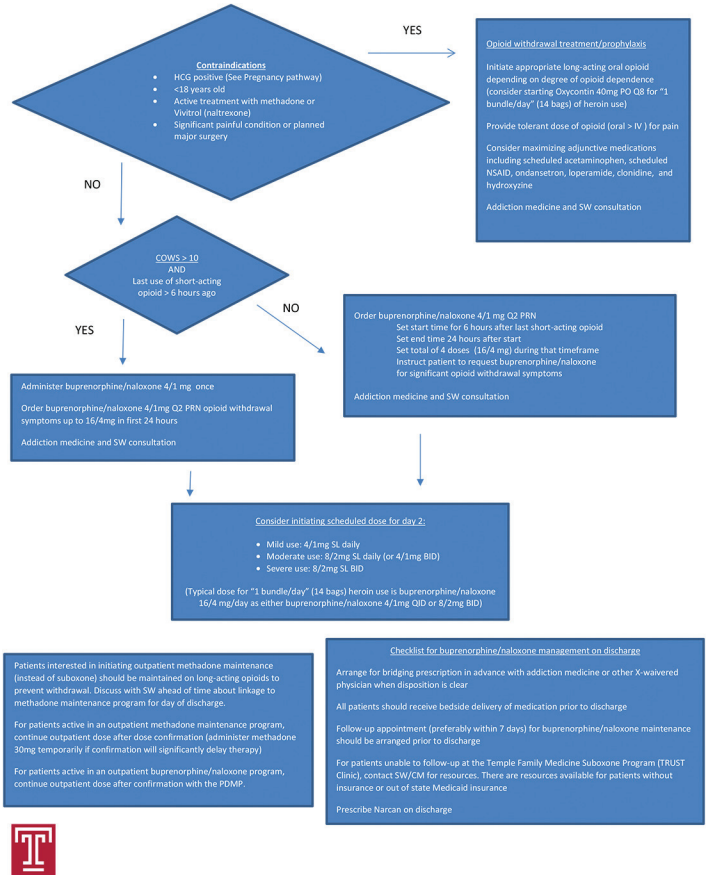


Figure 1. Admission Buprenorphine/Naloxone Induction Guide.

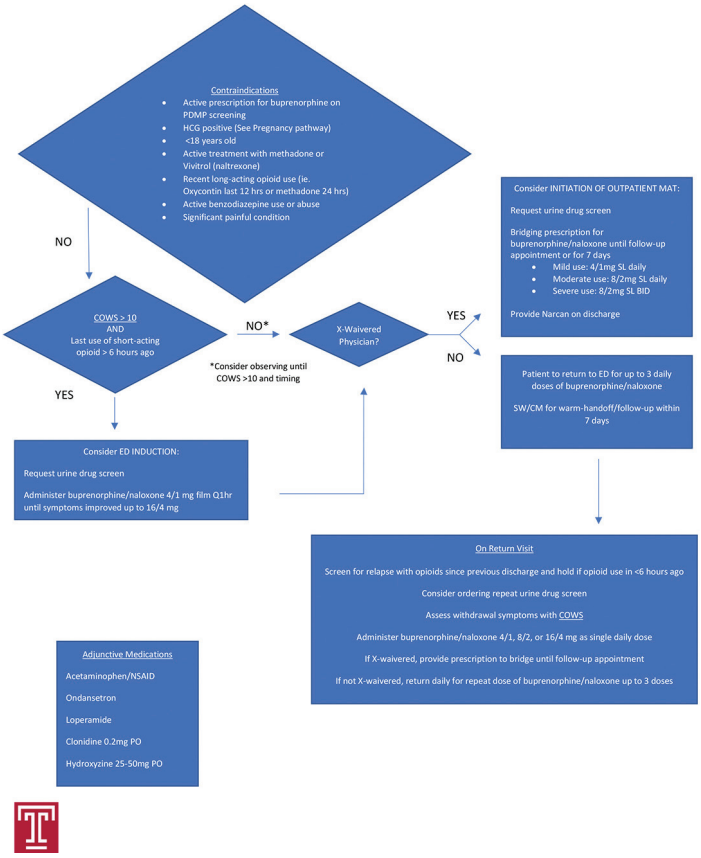


Figure 2. ED Discharge Buprenorphine/Nalonone Pathway.

23 Improving Burnout through Resident Shift Adjustments: A Wellness Innovation

Manchester L, McParlane J, Dehon E / Yale Emergency Medicine Residency; Beaumont, University of Mississippi Medical Center

Introduction/Background: According to the 2017 National Emergency Medicine (EM) Wellness Survey, 76% of EM residents report symptoms of burnout. Shift work is frequently cited as a leading source of burnout. Recent evidence has indicated that 8-hour shifts are ideal for EM, yet most residencies are not using such short shifts. Physician workload and emergency department (ED) crowding are also commonly cited causes of burnout.

Learning Objective: The objective of this innovation is to improve resident self-reported burnout by adjusting shift times and staffing in the emergency department (ED).

Curricular Design: Based on the results of a residency-wide needs assessment which noted frequent concerns over long shift times and resident understaffing, a pilot 4-week block was created (see image 1 and 2). This block reduced all resident shifts to 9 hours (including 1 hour overlap for sign out), and increased resident staffing during busier times. Second year residents will also work fewer "swing shifts" per block, and sign-out times were clustered across most shifts to foster post-shift social opportunities.

Impact/Effectiveness: Pre- and post-pilot data will be collected using a set of well-validated measures of wellbeing and burnout, including the Mini Z. Patient outcomes and department flow will also be studied to ensure there is no harm caused by the staffing changes. Based on feedback the schedule may be adjusted and piloted again in a later block. We expect residents involved in this pilot study will report lower levels of burnout, with increased time for sleep, exercise, and socializing. If results are promising, these changes will become the standard schedule in this residency program for following years.

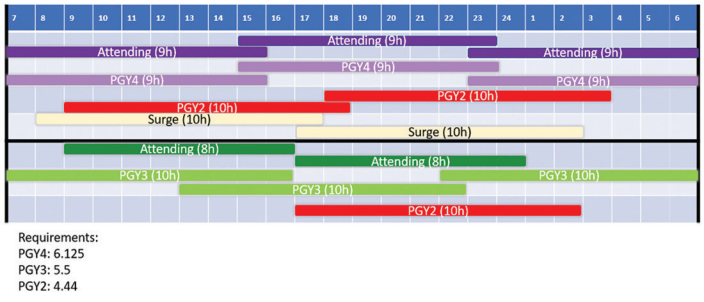


Figure 1. The current resident schedule.

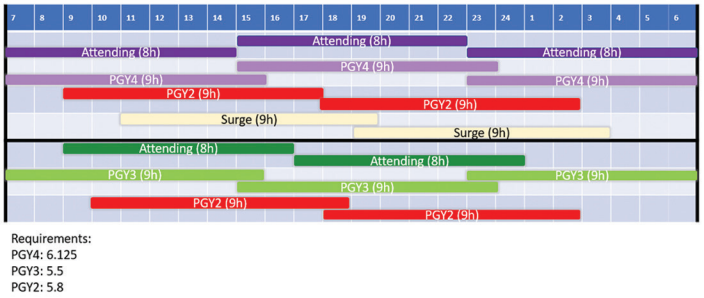


Figure 2. The pilot schedule.

24 Integrating Developmental Medicine into Longitudinal Pediatric Emergency Medicine Teaching for EM Residents

Picard L, Bodkin R, Pasternack J/ University of Rochester Strong Memorial Hospital

Introduction: The pediatric component of the core curriculum at the University of Rochester was previously covered in lectures from pediatric emergency medicine (PEM) fellows and faculty members along with simulated cases run by PEM faculty. The redesigned PEM curriculum now includes small group sessions where the residents discuss cases with PEM fellows and faculty members; each session with its own theme (cardiac, GI, etc.), each group also explores the intricacies of taking care of patients suffering with developmental delays, autism and ADHD. Additionally, the curriculum includes simulations and hands-on sessions with standardized pediatric patients.

Learning Objective: Understand behavioral differences in the pediatric population based on age and developmental disorders. Integrate developmental medicine into longitudinal case-based curriculum of pediatric emergency medicine. Learn and practice communication and hands-on skills with patients and families

Curricular design: The new pediatric core curriculum for the EM residents integrates the medical knowledge and skills to not only treat the typical pediatric patients, but also how to properly care for behaviorally-complex pediatric patients with similar complaints. Each small group session runs through themed pediatrics cases in a pediatric patient, after which facilitators discuss how management of these cases through the lens of developmental medicine. Residents have the opportunity to splint toddlers and school-aged children during a splinting lab after discussing pediatric orthopedic cases with PEM fellows and faculty. During a trauma simulation day, one case focuses on interacting with a scared child and frantic parents, working through the complexity of the social interactions, gaining consent, and creating a therapeutic alliance with caregivers and child.

Impact: Developmental medicine plays a much larger role in the pediatric population. Interacting with children suffering with autism, ADHD, and developmental delays is an imperative skill. This integrated curriculum has provided a unique, well-rounded pediatric education that covers the basic pediatric knowledge needed to become competent EM physicians and the skills to succeed with complex pediatric patients.

Image 1.

Image 2.

25 Low-Cost Orthopedic Fracture Reduction Model

Pittman M/ Prisma Health - Upstate Emergency Medicine Residency / University of South Carolina SOM Greenville

Introduction/Background: Emergency physicians commonly reduce fractures, yet many emergency medicine (EM) residency graduates do not feel comfortable with this procedure. The competing needs of multiple residencies within an institution and the desire to mitigate complications can lead to decreased hands-on experience. EM residency graduates have reported much of their comfort with fracture reduction was obtained post-graduation. A low-cost model for fracture reduction may increase confidence and ability.

Education Objectives: This model was developed to provide a realistic apparatus to practice the reduction of displaced fractures, allowing learners to gain a skillset before its application to patients. Practitioners may also maintain proficiency if clinical practice does not provide a high volume of suitable patients. This model could be used to assess the skills and milestones of training. The objective of this model is to provide a realistic hands-on apparatus to practice the reduction of displaced fractures.

Design: The current prototype consists of polyvinyl chloride (PVC) pipes (bones), elastic cords (approximating muscles, tendons, and overall resistance), foam (soft tissue), simulated skin, bolts, and a pre-fabricated hand. Pipes are sized and cut to

approximate the bones of interest with a fracture created at the desired point. Elastic cords run externally along the PVC pipe, with a separate cord running in the middle of the fractured pipe to prevent longitudinal collapse of the displaced segments due to the external cords. In order to force individuals to recreate the fracture and longitudinally separate the segments before relocation, a smaller segment of PVC pipe with an irregular cut end is fitted into the fracture site.

Impact/Effectiveness: This model was piloted in EM resident simulation. After use, residents reported improved confidence in their ability to reduce fractures, particularly liking the ability to uncover the fracture and directly visualize the motion needed for successful reduction.

Image 1

Image 2

26 Modifying the Ottawa Clinic Assessment Tool for Emergency Medicine Resident Assessment

Wolfe J, Stull M / Case Western Reserve University School of Medicine;University Hospitals-Cleveland Medical Center

Introduction: Faculty assessment is a major driver of resident growth and development. Ensuring assessment tools consistently create clear, specific, and constructive feedback for residents provides greater value to this critical aspect of residency training.

Learning Objective: To create an assessment tool that would 1) increase response rates by faculty, 2) omit redundancies and employ a rating scale discouraging rating residents in a vertical line ("all 5's"), 3) discriminate between class years, and 4) contribute to resident growth and development in its pilot period.

Curricular Design: The Ottawa Clinic Assessment Tool (OCAT) is a workplace-based assessment tool originally developed for assessment of surgical trainees and has been further validated in internal medicine resident clinics. The tool has been found to improve quality of feedback, encourage formative criticism, and required no more than 5 minutes to complete, leading to a higher frequency of feedback. We adapted the OCAT for use in the EM environment (i.e EM-OCAT). This tool uses an entrustment scale with the rater assessing each domain on a scale from "I had to do" to "I did not need to be there." We propose this as a more intuitive structure for assessment in replacement of the often confusing Leikert scale, where respondents choose an option on a scale from "strongly agree" to "strongly disagree". The EM-OCAT assessment form consists of this rating scale employed across core residency training domains including history and physical exam, case presentation, differential diagnosis, management plan, patient/family communication, documentation, leadership, time management, situational awareness, and industriousness, in addition to space for directed free text comments.

Impact/Effectiveness: The EM-OCAT has been piloted in a single residency program as a replacement for shift evaluation tools. Thus far, faculty feedback has been uniformly positive in terms of its adaptability and ease of use. Residents have cited the EM-OCAT as a driver of improved quality and quantity of growth-oriented feedback received in the clinical environment. Future steps include developing further validity evidence for the tool's effectiveness in the EM setting.

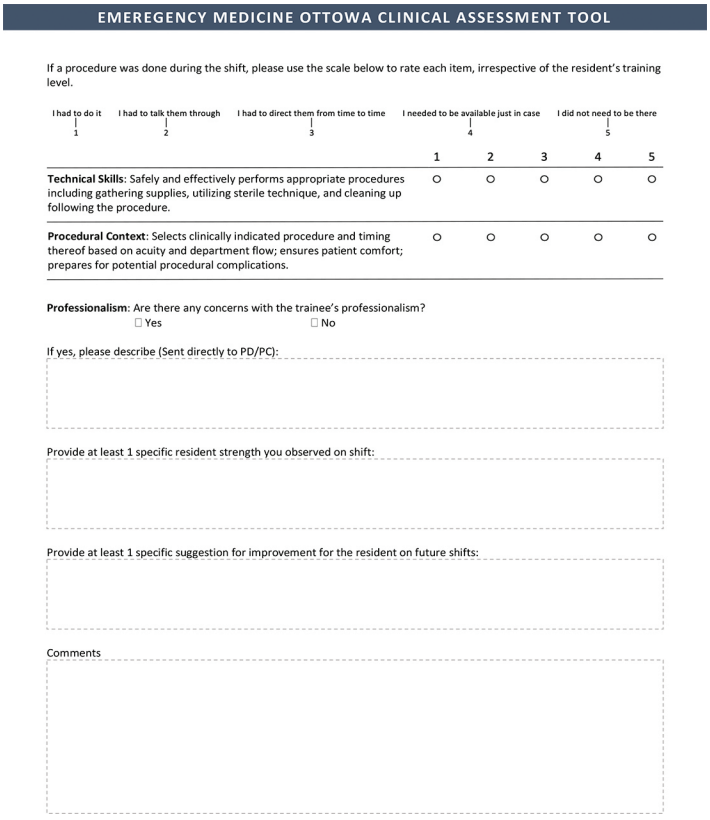
EMEREGENCY MEDICINE OTTOWA CLINICAL ASSESSMENT TOOL

Please use the scale below to rate each item, irrespective of the resident's training level:

I had to do it	I had to talk them through	I had to direct them from time to time	I needed to be available just in case	I did not need to be there
1	2	3	4	5

	1	2	3	4	5
History & Physical Exam: Efficiently and reliably gathers clinical data through the history and physical exam.	○	○	○	○	○
Case Presentation: Provides patient presentations to attendings and consultants through synthesis of history and physical; facilitates safe and effective hand-offs.	○	○	○	○	○
Differential Diagnosis: Considers a wide differential in all patient presentations and effectively prioritizes life threats.	○	○	○	○	○
Management Plan: Develops and follows through with appropriate patient management plans (i.e. imaging, lab work, and treatment options).	○	○	○	○	○
Patient/Family Communication: Provides effective, sensitive and respectful communication with language appropriate to patient understanding; establishes rapport and trust.	○	○	○	○	○
Documentation: Completes documentation in a timely manner; documents appropriately for patient acuity level and includes thorough medical decision making.	○	○	○	○	○
Leadership: Effectively leads the team in a goal-oriented and collaborative manner (i.e. interprofessional communication and collaboration, running resuscitations, etc.).	○	○	○	○	○
Time Management: Manage tasks, handles interruptions, and modifies time spent with individual patients appropriately.	○	○	○	○	○
Situational Awareness: Appropriately triages new patient arrivals, effectively prioritizes tasks; anticipates and mitigates issues with patients, families, and consultants.	○	○	○	○	○
Industriousness: Recognizes the need to support colleagues by contributing to patient care when and where needed and attempts to optimize patient throughput.	○	○	○	○	○

Image 1.



EMEREGENCY MEDICINE OTTOWA CLINICAL ASSESSMENT TOOL

If a procedure was done during the shift, please use the scale below to rate each item, irrespective of the resident's training level.

I had to do it (1) | I had to talk them through (2) | I had to direct them from time to time (3) | I needed to be available just in case (4) | I did not need to be there (5)

	1	2	3	4	5
Technical Skills: Safely and effectively performs appropriate procedures including gathering supplies, utilizing sterile technique, and cleaning up following the procedure.	○	○	○	○	○
Procedural Context: Selects clinically indicated procedure and timing thereof based on acuity and department flow; ensures patient comfort; prepares for potential procedural complications.	○	○	○	○	○

Professionalism: Are there any concerns with the trainee's professionalism?
☐ Yes ☐ No

If yes, please describe (Sent directly to PD/PC):

Provide at least 1 specific resident strength you observed on shift:

Provide at least 1 specific suggestion for improvement for the resident on future shifts:

Comments

Image 2.

27 Near Peer Direct Observation and Feedback

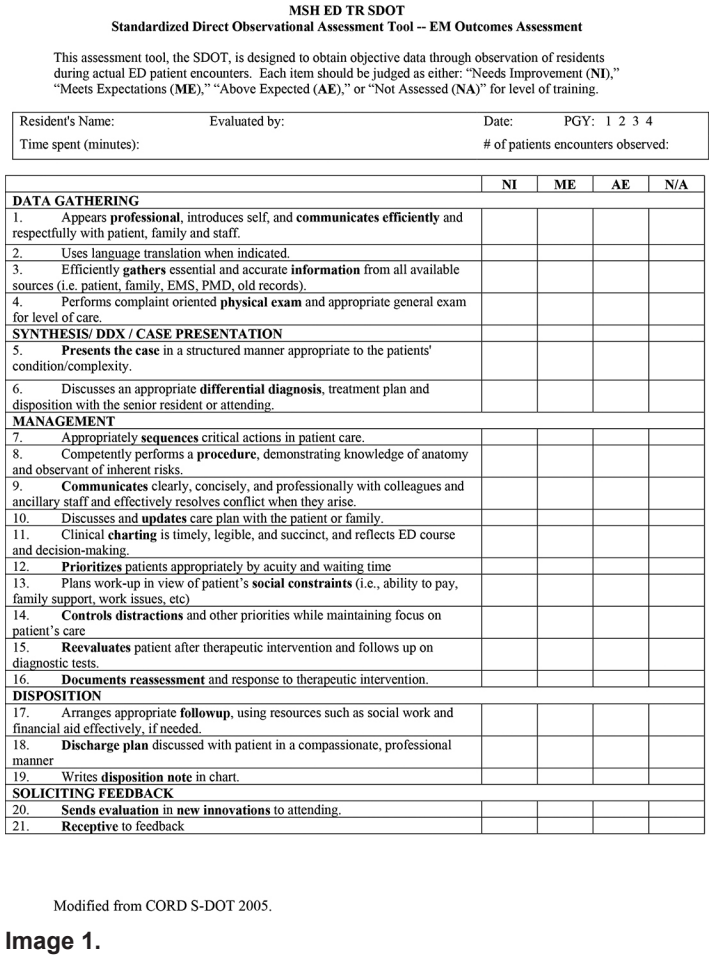
Sethi M, Chen A, Hajicharalambous C / Mount Sinai Emergency Medicine

Introduction: Assessing clinical knowledge of Emergency Medicine residents and providing feedback is essential to residency training. However, resident assessments usually involve unstructured evaluations of residents by faculty, complicated by the unpredictable environment of the ED, faculty availability, and limited training in providing feedback.

Educational Objectives: Educational objectives of this study were primarily to create a curriculum in which a PGY3 resident on a dedicated teaching rotation would be responsible for providing a structured evaluation of junior residents. Additional objectives were to provide senior residents an opportunity to learn to give feedback, and to introduce a culture of feedback within the department by increasing opportunities for feedback to be given. To improve resident assessments by the creation of a resident-based feedback curriculum, involving a dedicated senior resident with direct observation shifts of juniors, and the use of a standard direct observation tool for evaluation.

Curricular Design: PGY3 residents were assigned 4 weeks where they served as the Teaching Resident (TR). The TRs were assigned approximately ten 2-hour observation shifts per month. PGY1 residents were observed in the general ED while PGY2s were observed in the critical care area. The TR used a modified CORD standard direct observation tool (SDOT) to evaluate the junior residents. After evaluating the residents, the TR would review the SDOT with the observed resident to highlight areas of strength and areas for improvement.

Impact: The impact of the near peer direct observation shift curriculum is trifold. It creates an opportunity for senior residents to have formal training in providing feedback, an invaluable skill that is often not taught in residency. It also allows for junior residents to receive adequate and timely feedback from a near peer. Finally, it helps to create a culture of giving and soliciting feedback in an often busy and time constrained environment. To measure the effectiveness of this curriculum, we will both survey residents to assess its impact, as well as measure the number of faculty evaluations of residents pre- and post- curriculum initiation.



MSH ED TR SDOT
Standardized Direct Observational Assessment Tool -- EM Outcomes Assessment

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**)," "Meets Expectations (**ME**)," "Above Expected (**AE**)," or "Not Assessed (**NA**)" for level of training.

Resident's Name:	Evaluated by:	Date:	PGY: 1 2 3 4
Time spent (minutes):		# of patients encounters observed:	

	NI	ME	AE	N/A
DATA GATHERING				
1. Appears **professional**, introduces self, and **communicates efficiently** and respectfully with patient, family and staff.				
2. Uses language translation when indicated.				
3. Efficiently **gathers** essential and accurate **information** from all available sources (i.e. patient, family, EMS, PMD, old records).				
4. Performs complaint oriented **physical exam** and appropriate general exam for level of care.				
SYNTHESIS/ DDX / CASE PRESENTATION				
5. **Presents the case** in a structured manner appropriate to the patients' condition/complexity.				
6. Discusses an appropriate **differential diagnosis**, treatment plan and disposition with the senior resident or attending.				
MANAGEMENT				
7. Appropriately **sequences** critical actions in patient care.				
8. Competently performs a **procedure**, demonstrating knowledge of anatomy and observant of inherent risks.				
9. **Communicates** clearly, concisely, and professionally with colleagues and ancillary staff and effectively resolves conflict when they arise.				
10. Discusses and **updates** care plan with the patient or family.				
11. Clinical **charting** is timely, legible, and succinct, and reflects ED course and decision-making.				
12. **Prioritizes** patients appropriately by acuity and waiting time				
13. Plans work-up in view of patient's **social constraints** (i.e., ability to pay, family support, work issues, etc)				
14. **Controls distractions** and other priorities while maintaining focus on patient's care				
15. **Reevaluates** patient after therapeutic intervention and follows up on diagnostic tests.				
16. **Documents reassessment** and response to therapeutic intervention.				
DISPOSITION				
17. Arranges appropriate **followup**, using resources such as social work and financial aid effectively, if needed.				
18. **Discharge plan** discussed with patient in a compassionate, professional manner				
19. Writes **disposition note** in chart.				
SOLICITING FEEDBACK				
20. **Sends evaluation** in **new innovations** to attending.				
21. **Receptive** to feedback				

Modified from CORD S-DOT 2005.

Image 1.

28 Novel Utilization of Digital Marketing Tools for Dissemination of Faculty Development Content

Michael S, Hitt-Laustsen J, Kaplan B, Kendall J / Denver Health Residency in Emergency Medicine; University of Colorado; University of Colorado Denver Anschutz Medical Campus

Introduction/Background: A needs assessment for an ACGME-required faculty development program identified three priorities for faculty development in our program: clinical teaching, feedback, and evaluation. Ensuring that our large, diverse group had access to evidence-based, EM-specific, clinically relevant resources and departmental best practices was an undertaking that was poorly suited to a workshop-based format due to its associated relatively poor attendance, high resource utilization, and low frequency. Educational Objectives: We identified content and objectives that aligned with the priorities of interest from two sources: previously published or emphasized topics in similar programs and departmental best practices (Table 1).

Learning Objective: We identified content and objectives that aligned with the priorities of interest from two sources: previously published or emphasized topics in similar programs and departmental best practices (Table 1).

Curricular Design: We utilized a marketing automation platform (MAP) to email just-in-time weekly curricular emails with brief, evidence-based content to faculty. Utilization of a MAP allows for content curation, design, scheduling, and analytics that are unavailable via standard email. For the week following each email, faculty received a pre-scheduled text message one hour prior to shifts with a reminder and link to the week's content. A synchronous 52-week structure allowed for breadth and depth of content and sent an intentional message that the educational mission is valuable and ongoing.

Impact/Effectiveness: Since 2017, we have been delivering weekly content to approximately 115 faculty who collectively have a minimum estimated exposure rate of at least 30-47% (n=33-56), demonstrating stable demand and perceived value. Resident evaluations of faculty in several clinically relevant domains have improved over that time: clinical teaching (4.14%), feedback (6.55%), mentorship by faculty (5.4%), resident-faculty interaction (8.7%), and amount of supervision (7.0%). Our experience suggests that utilization of digital marketing tools for just-in-time delivery of faculty development content is both feasible and potentially impactful.

Table 1.

Week of Year	Module Title	By the end of this week, faculty will [be able to]:
1	Goals Set the Tone for The Shift	Help learners set goals and provide goal-oriented feedback
2	Signposting 101	Assist trainees in identifying feedback and teaching being provided.
3	Limited Time Offer!	Appreciate that there are a variety of efficient ways to teach clinically in the ED.
4	Introduction to Micro-skills	Practice asking the learner for a commitment and probing for supportive evidence.
5	More Practice with Micro-skills	Practice teaching general rules, reinforcing what was done well, and correcting mistakes.
6	The One Minute Preceptor in Action!	Apply all five micro-skills of the One Minute Preceptor technique.
7	SNAPPS Puts the Learner in the Driver's Seat	Orient the learner to the SNAPPS technique.
8	Differential Building	Use differential diagnoses to guide clinical teaching.
9	Aunt Minnie	Appropriately utilize the Aunt Minnie paradigm to teach about common presentations.
10	Goals Revisited	Use EM milestones to guide evaluation of residents.
11	Procedural Teaching Done Right	Use evidenced-based methods to teach procedures on shift.
12	"Let's Talk About Why"	Demonstrate open communication techniques with learners, staff, patients, and families.
13	Immortalizing Teaching, Part 1: Take Notes	Use written signposts to help learners identify clinical teaching.
14	Immortalizing Teaching, Part 2: Clinical Doldrums	Identify strategies that create complexity out of simple patient presentations.
15	Immortalizing Teaching, Part 3: The Digital Future	Apply technology-based tools to clinical teaching.
16	Immortalizing Teaching, Part 4: Dissemination	Use digital tools that create memorable teaching experiences and engage wider audiences.
17	Deliberate Practice	Explain how the concepts of deliberate practice apply to the practice of medicine.
18	Deliberate Supervision	Appreciate how supervision style affects feedback and deliberate practice.
19	Deliberate Supervision: Understanding Ownership	Use scaffolding frameworks to explain patient ownership principles.
20	Deliberate Supervision: Using the Team	Use the clinical team as a supervisory resource.
21	Deliberate Supervision: The Best Laid Plans	Be flexible when operational challenges threaten supervision and ownership.
22	Deliberate Supervision: Direct Observation	Use direct observation techniques to optimize feedback.
23	List-Making	Use patient lists as a feedback and teaching tool.
24	What Makes a Teaching Case?	Identify teachable moments in cases often considered "non-teaching."
25	Happy [Academic] New Year!	Set clear expectations as learners adjust to their new roles.
26	Toward a Frustration-Free Shift	Communicate essential orientation information at the start of the shift.
27	Honoring the Contract	Abide by institutional teacher-learner contracts.
28	What Do Learners Even Want, Anyway?	Focus on teaching behaviors that are valued by learners.
29	What Do Top Clinicians Do	Identify strategies common among successful faculty.
30	Compassion Fatigue	Role model behaviors that help mitigate compassion fatigue.
31	More Help with Compassion Fatigue	Implement strategies that help learners reframe difficult experiences.
32	Preparing for Clinical Teaching	Choose from pre-shift strategies that maximize clinical teaching efforts.
33	Thinking About Thinking	Explain how dual processing theory affects clinical decision making.

34	Biases and Mitigation Strategies	Identify and teach about common cognitive biases and strategies to mitigate them.
35	Time Out!	Use and teach diagnostic time outs while engaging in patient care.
36	Navigating a Minefield	Model behaviors that limit the effect of biases on clinical decision making.
37	Learners Everywhere!	Effectively engage and manage learners of multiple levels.
38	Teaching to Teach	Teach teaching and supervision strategies to senior learners.
39	Milestones	Explain the intended role of the milestones in EM training.
40	Entrustable Professional Activties (EPAs)	Explain the concept of entrustability as it relates to the EPAs.
41	Gimme a Break	Role model breaks in clinical shifts. Help learners take them, too.
42	Your Feedback Sandwich Gives Me Indigestion	Utilize evidence-based feedback frameworks.
43	You Have Needs, Too!	Solicit and incorporate feedback on clinical teaching from learners.
44	Hooray for Science!	Incorporate evidence-based medicine into clinical teaching.
45	What does efficiency even mean?	Help learners reframe their goals to be "efficient."
46	Efficiency is an outcome, not a goal	Teach residents developmentally appropriate strategies for improving efficiency.
47	Sign-Outs as Teaching Tools	Use team sign-outs as opportunities to assess communication.
48	Optimizing Communication with Consultants	Teach principles that improve communication with other members of the care team.
49	Assessing Communication with Patients and Families	Observe and provide feedback on communication with patients and families.
50	Addressing Practice Variation With Evidence	Assist trainees in putting faculty practice variation into context.
51	Winter Blahs	Share strategies to overcome seasonally-related job frustrations.
52	Happy New Year!	Review mid-year expectations with learners.

29 Organize and Improve Your Clinical Competency Committee With Google Sheets

Fallon T/ Maine Medical Center

Objective: We identified the process of preparation for the Clinical Competency Committee (CCC) meeting as time consuming and prone to individual variability. We aimed to create a data tool that would allow us to easily aggregate, compare, and evaluated data and present this information to our CCC.

Abstract: The clinical competency committee (CCC) must review a broad array of data in an efficient and standardized way. Creation of a structured tool will improve the work of the clinical competency committee and resident assessment.

CCC leaders set out to design a tool that would organize the available data ahead of the CCC meeting, facilitate review of this information by the faculty, and allow for a structured presentation to the committee. We also hoped to reduce the amount of repetitive data entry required by our program coordinator and simplify the process of semiannual review meetings.

A CCC Data Tool was created using Google Sheets. Fields are color coded to identify those that are completed by the program coordinator during a data entry phase as well as those to be completed by the faculty reviewer. A presentation slide is projected during the CCC discussion and used to identify key data. Additional pages present a graph of the 23 milestone scores and aggregate data for export. Color codes are used to highlight milestones where the resident has failed to progress or is more than a standard deviation from the mean for their class. Data is exported using a mail merge to create a semimanual review letter for each resident that can be used by the program director to facilitate the feedback meeting. This ensures that the work product of the CCC is effectively communicated to the resident.

CCC members reported that they would recommend this system to another EM program. Faculty noted decreased time required to prepare for the CCC and a more uniform format to the meeting. Moving forward, we will compare inter-rater reliability amongst faculty and provide ongoing professional development for our CCC members. Our program coordinator estimated that this has reduced her preparation time by over 50% for each meeting and she no longer needs to import hand written data into an electronic format. This system has been adopted by a second EM training program.

Table 1.

	A	B	C	D
38	SDOT	SDOT By:	SDOT Date:	
39	SDOT 1 Data	Sholl	not done yet	
40	SDOT 2 Data	Barker	6/4/18	
41				
42	ROSH Reviews Avg%	84%		
43	ROSH Reviews Up to Date through:	July- mini test 2 due & August		
44	Cumulative Conference Attendance	94%		
45	Moonlighting	No		
46	Administrative/Jana Comments:	ROSH review, Patient Care FUs June 2018 & July, & August Teaching duties		
47	Research Project Complete	Yes		
48	Research Project Title	Pedi Abdominal Catastrophe Image Published		
49	Previously Completed Research Projects	US Guided hematoma block proposal writing and surprise question in Sepsis drafting manuscript		
50	In-Service Exam:			
51	PGY1	87		
52	Percentile	99%		
53	Chance of Passing	99%		
54	PGY2	97		
55	Percentile	99%		
56	Chance of Passing	99%		
57	PGY3			
58	Percentile			
59	Chance of Passing			
60				
61	Total # Procedures	1224		
62	Class Range Procedures	740-1,643		
63	Specific Procedures Below Required	Peds resusc 6(15), Peds Trauma 8 (10)		
64				
65	Milestones	Avg		PRN Comments:
66	Emergency Stabilization	PC1	4	Fallon: At the top of his class. Hayder: Very strong. Managed a trauma patient and remained the clear team leader while also placing femoral A line and working with trauma attending on REBOA.
67	History and Physical	PC2	3	Nelson: Rarely have to add to his presentation, he has the answers. A few comments to be aware of his affect with patients and to not minimize patients with less emergent complaints.
68	Diagnostic Studies	PC3	3.5	Nelson and Perron: Occasionally hesitant to do it the attending's way.
69	Diagnosis	PC4	3	Fallon: Takes medical management to the next level, starting ICU therapy, etc. Crispo: Occasionally has difficulty revising differential in response to updated information.
70	Pharmacotherapy	PC5	4	Fallon: Considered appropriate med changes for patient being intubated after being found down. Did appropriate post ROSC management of pt in MOB.
71	Observation and Reassessment	PC6	3	Perron: One of the few areas that is not a strength.
72	Disposition	PC7	3.5	MacKenzie: Don't see admission as a failure. Fallon: consider social reasons for admission, don't be dogmatic.
73	Multi-Tasking	PC8	3.5	15.7 Pts/shift (11.9-17.3), 1.97 per hour (1.49-2.17), multiple comments that he does this well but should push himself to be at the top of his class for efficiency.

Table 2.

John Smith			Mentor Meeting	Croft	
CCC Reviewer: Fallon			SDOT	SDOT By:	SDOT Date:
From Prior CCC:			SDOT 1 Data	Sholl	not done yet
Strengths:			SDOT 2 Data	Barker	6/4/18
	1 Multi-tasking				
	2 Medical Knowledge		ROSH Reviews Avg%	84%	
	3 Professional Values/ Accountability		ROSH Reviews Up to Date through:	July- mini test 2 due & August	
	4-8		Conference Attendance	94%	
Opportunity			Moonlighting	No	
	1 History & Physical		Administrative/Jana Comments:	ROSH review, Patient Care FUs June 2018 & July, & August Teaching duties	
	2 Technology		Research Project Complete	Yes	Pedi Abdominal Catastrophe Image Published
	3 Patient Centered Communication				US Guided hematoma block proposal writing and surprise question in Sepsis drafting manuscript
	4-8 Team Management		In-Service Exam:		
			PGY1	87	
Current CCC:			Percentile	99%	
Strengths:	Milestone	Summative Statement	Chance of Passing	99%	
	1 Emergency Stabilization	Overall competence with critical care including medical management, team leadership, and procedural competency is a strength for Dr. Smith.	PGY2	97	
	2 Medical Knowledge	Continued performance at 99 percentile nationally on In-service exam with matching clinical knowledge.	Percentile	99%	
	3 Procedures: All aspects	Across the board in terms of general procedures as well as lines and airway management he is facile and confident.	Chance of Passing	99%	
	4-8 Team Management	Owns the critical care room, is the clear leader though his voice and actions.	PGY3		
			Percentile		
Opportunity			Chance of Passing		
	1 Multi-Tasking	Although performing well, he has been encouraged by multiple attendings to push himself and be the top of his class.			
	2 Accountability	Behind on administrative duties. Needs to be a leader as a chief.	Total # Procedures	1224	
	3 Patient communication	Seems to be improving. There are some very positive comments. Still some comments on his interaction with patients with less acute complaints. Be sure to address patient's concern.	Class Range Procedures	740-1,643	
	4-8		Specific Procedures Below Required		Peds resusc 6(15), Peds Trauma 8 (10)
		Dr. Smith has demonstrated himself to be a strong clinician over his training and this is evident in the PGY3 year. He has a strong mastery of critical care medicine which is evident not only in medical knowledge but also in his team management and procedural skills around CC. Moving forward, he can work on his accountability to the program and his administrative duties as well as his communication with patients, ensuring that he establishes a therapeutic relationship independent of the patients chief complaint.			
Summative Comments:			Milestone Average		
			Low	3	
			High	4	

30 PEM for EM: A Novel Pediatric Emergency Medicine Curriculum

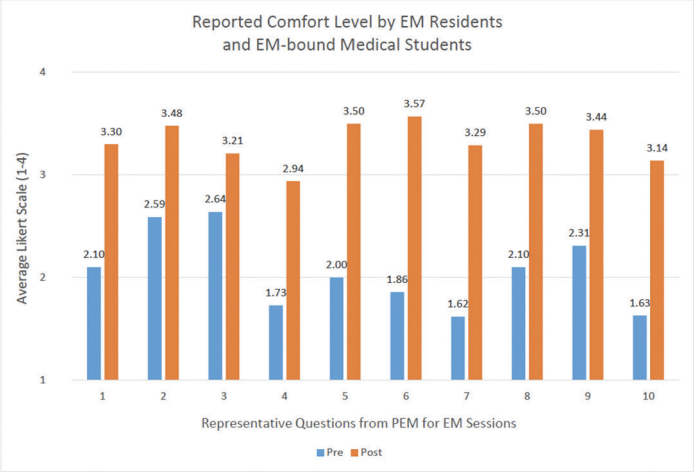
Schwartz K, Krautwald M, Oyama L, McDaniel M/ University of California, San Diego; Rady Children's Hospital - San Diego

Introduction/Background: Children comprise approximately 20% of the emergency medicine (EM) patient population and graduates of EM residencies report a desire for more training in pediatric emergency care. Expertise from Pediatric EM (PEM) trained physicians may not be available at every institution.

Learning Objective: Design a comprehensive, interactive pediatric emergency medicine curriculum that is translatable to any EM residency.

Curricular Design: A novel PEM curriculum was devised by PEM fellowship trained physicians/educators. Each session comprised a one-hour module on an essential PEM topic. They involved team-based learning, flipped classroom, simulation, procedural workshops, and educational games. Examples included, "The Crumping Newborn," "Pediatric Respiratory Distress Toolbox," "Oregon Trail: Pediatric ID in the ED," and "Magic Bubbles: The Art of the Pediatric Exam, Pain Control, and Distraction." A facilitators' guide, educational resources, and any necessary stimuli were provided to PEM faculty, who led the module and contributed feedback. Learners were EM residents at all levels and some sessions also included rotating EM-bound medical students. Anonymous pre and post-session evaluations were collected.

Impact/Effectiveness: PEM for EM implemented gamification, team-based learning, and simulation to teach essential pediatric EM care. Pre and post-session Likert 1-4 evaluations appraised learner self-assessment of preparation and/or comfort level with common pediatric ED management. The 10 modules, each of which were evaluated individually, showed an increase in confidence level (see Figure 1) and qualitative feedback was overwhelmingly positive. Suggested areas for improvement included requests for follow-up materials, which were incorporated in later sessions, and use of this curricular style in other aspects of didactics. The curriculum is currently in preparation for use at other institutions, including an additional site implemented this year.



Key: Representative Questions from PEM for EM Sessions
1) Appropriate BRUE Management
2) Abdominal Emergency DDx by Age
3) Common Peds ID Diagnosis
4) Respiratory Support Use
5) U/S for Intussusception
6) Restraint for Procedures
7) Palatable Abx Choice
8) Salter-Harris Fracture Identification/Management
9) High Risk Non-Accidental Trauma Identification
10) Perform Peds GU Exam

Figure 1. Reported Comfort Level by EM Residents an EM-bound Medical Students.

31 Pork Belly Procedural Trainers: Creating Realistic, Cost-effective and Reusable Simulation Tools for Resident Education

Kei J, Mebust D / Kaiser Permanente San Diego Medical Center

Introduction: The field of emergency medicine (EM) requires physicians to master a variety of different procedural skills. However, many commercially available task trainers and simulation mannequins lack fidelity and are extremely expensive. Often made of plastic or rubber, they make the overall experience unrealistic and unsatisfying. Pork belly with tissue and skin can be used to create several realistic and cost effective procedural trainers.

Educational Objectives: Pork belly simulation trainers (PBSTs) were created with the following educational objectives in mind: 1) provide learners with an authentic procedural experience, replicating human flesh and 2) allow learners to refine and perfect their procedural skills without harming patients in the process. Pork belly simulation trainers were

designed to provide training institutions a more realistic and cost-effective alternative to the procedural mannequins currently available and can easily be incorporated into residency training by following some simple instructions and guidelines.

Curricular Design: We have designed PBSTs for the following procedures: cricothyrotomy, chest tube insertion, lumbar puncture, thoracentesis and ultrasound guided paracentesis. PBSTs can be incorporated into regular simulation laboratory scenarios and they can be used in an intern procedure day during resident orientation. Residents are provided didactic material in the form of texts, journal articles, instructional videos, and online posts to be reviewed prior to the procedure day. Brief lectures on each procedure will be given, followed by a hands-on session where they perform the procedure on the PBSTs with the help of senior residents or attending physicians. Learners can also be evaluated on their procedural skills with the use of knowledge and performance checklists.

Impact/Effectiveness: Resident and medical student feedback on these PBSTs has been overwhelmingly positive. The innovative, realistic feel has created academic interest and they have been featured at national and regional EM conferences for procedural breakout sessions. Easy, do-it-yourself instructions allow the trainers to be incorporated into any resident program curriculum and can be found at www.baconsimulation.webnode.com

Image 1.

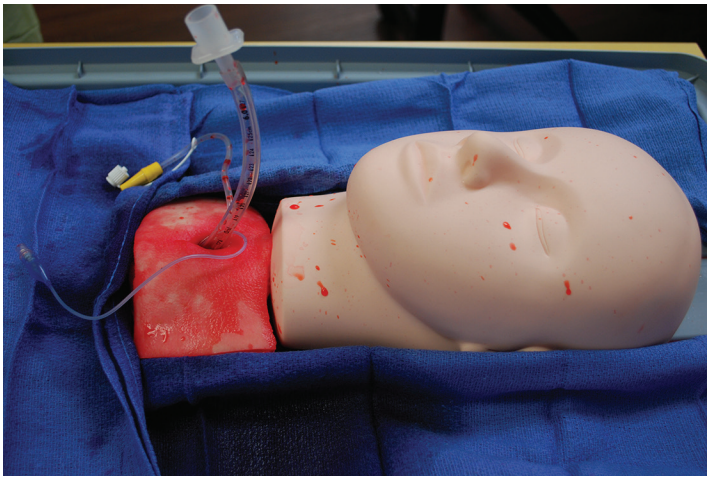


Image 2.

32 Prefrontal Cor-GUESS: Gamification that Motivates Self-Directed Learning

Crossman M, Zhang X / Thomas Jefferson University

Introduction: Gamification, the application of game design elements to traditionally non-game contexts, is a popular method to achieve increased engagement by encouraging participation amongst students. It is intended to augment instructional design, not replace it. However, it is still to be elucidated whether it is effective in fortifying learning and how exactly it achieves this. Prefrontal Cor-GUESS, an adaptation of gamification, was created to see if it motivates engagement in learning.

Learning Objective:

1) Facilitate learners' discovery of their knowledge gaps.
2) Motivate self-directed learning to close those gaps.
3) Inspire engagement and participation in learning.
4) Create a game that is easy and inexpensive to replicate.

Design: Emergency Medicine residents and students at a tertiary academic center participated as part of their weekly didactic. Learners were provided with resources to review beforehand on the topic, "controlling hemorrhage", followed by a lecture that was broken up with activities. Prior to presenting blood thinners and their reversal, learners were asked to play a game testing their retention of the material provided prior. Roughly 40 learners were then separated into 2 teams, each team given a deck of cards. Players hold the card against their forehead, which will display a blood thinner or reversal agent, and must figure out which card they have. After the talk, learners were given evaluations with options yes/no.

Impact: The results of the 22 evaluations completed indicate that this method of gamification was overall successful. The majority (86%) said the game helped them identify knowledge gaps and 90% said it motivated them to close these through self-directed learning. Open-ended responses stated

that they liked the presentation because it was "engaging" and "interactive with a lot of participation." It can be easily implemented, used in an array of group sizes, and can be adapted to cover a plentitude of topics in medical education.

Image 1

33 Preparing Tomorrow's Leaders: A Novel Approach to an Emergency Medicine Administration Rotation

Krzyzaniak S, Hafner J/ University of Illinois College of Medicine at Peoria

Introduction: The ACGME does not clearly define how programs should prepare residents for future administrative roles and responsibilities. The 2013 CORD Model Curriculum includes specific topics in "Emergency Department (ED) Administration", however it does not recommend an ideal approach (i.e. didactics vs. dedicated rotation). Our residency curriculum includes a month-long ED administration rotation. However it was largely unstructured and dependent upon the engagement of our ED leadership. This resulted in a widely variable experience for our residents.

Learning Objective:

1) Prepare residents for basic administrative duties in community or academic practice
2) Expose residents to advanced administrative roles in preparation for future leadership roles
3) Empower residents to develop leadership skills within education, hospital administration and pre-hospital setting

Design: Our curricular design utilizes a humanist approach that emphasizes an individual's values and interests to promote autonomy and foster intrinsic motivation (self-determination theory). Residents are required to complete 15 mandatory and 5 selective activities (Table 1). The mandatory activities were chosen to provide a broad overview of EM leadership and administration. Learners choose 5 selective activities they feel are most important to their professional development. By encouraging autonomy in designing their specific rotation, we promoted internalization of motivation. Engagement was tracked using a sign-in sheet that was required for successful completion of the rotation.

Impact: The structure of this curriculum and the autonomy granted by allowing residents to select rotation components improved engagement. Our residents participated in a wide variety of selective opportunities (Table 2), reflecting the diverse interests of today's EM residents. Of the 51 selectives chosen, 49% were educational, 12% were EMS, 6% were research-related, and 33% were outside of these categories.

Table 1. Mandatory and Selective Activities for Advanced EM Leadership Rotation.

University of Illinois College of Medicine Peoria/OSF Healthcare
Emergency Medicine Residency

Mandatory Activities:

Department Administration	Residency Administration	Clinical Leadership
☐ ED Dept Mtg ☐ ED Executive Committee ☐ ED Advisory Council ☐ Pediatric ED Quality Meeting ☐ Quality & Safety Committee ☐ ED Leadership Meeting ☐ Trauma Committee M&M ☐ Unit Council ☐ Professional Peer Review	☐ EM Residency M&M presentation ☐ Journal club preparation ☐ Review ED deaths/bouncebacks ☐ Rotator orientation ☐ Personal Chart Review	☐ Coding/billing review

Selective activities (choose any 5)

Education	EMS	Research/Ultrasound
☐ Student teaching shift (4 hours) ☐ EBM shift (4 hours) ☐ M3 simulation ☐ M4 simulation ☐ M4 orientation ☐ EMIG activity ☐ UICOMP EM website blog post ☐ Student ultrasound shift (4 hour) ☐ Faculty meeting ☐ Program director roundtable (☐ Meet with ED Chair to discuss academic department administration ☐ Other _____	☐ Flight shift ☐ Ground shift ☐ EMS administration ☐ EMS region 2 advisory council ☐ Instructional activity with pre-hospital crew ☐ Ride along with EMS director for scene response/EMS QI ☐ FEMA/NIMS online training ☐ Other (per EMS director) _____	☐ Time spent on research must be approved by program director (may receive more than 1 credit, depending on project) ☐ Scanning shifts and QI with Ultrasound Director

ED: Emergency Department, M&M: Morbidity & Mortality, EBM: evidence-based medicine, M3: third year medical student, M4: fourth year medical student, EMIG: emergency medicine interest group, UICOMP: University of Illinois College of Medicine Peoria, EMS: emergency medical services, QI: quality improvement, FEMA/NIMA: Federal emergency Management Agency/National incident Management System

Table 2. Selective Activities.

Education	
Faculty meeting	(n=6)
Talk for pre-medicine students	(n=1)
Intern orientation	(n=1)
M3 simulation	(n=2)
M4 simulation	(n=2)
M4 orientation	(n=3)
Program Director's roundtable	(n=1)
EMIG social event	(n=1)
EMIG skills night	(n=3)
Medical student teaching shift	(n=1)
Medical student intern prep course	(n=1)
Residency fair	(n=1)
Chair meeting	(n=2)
EMS	
FEMA/NIMS course	(n=2)
EMS lecture for pre-hospital providers	(n=1)
Departmental disaster drill	(n=1)
EMS ride along	(n=2)
Research/Ultrasound	
QI project poster presentation	(n=1)
Ultrasound scan shift	(n=1)
Research project	(n=1)
Other	
Safety Saves (hospital QI meeting)	(n=1)
PFCCS course	(n=2)
Departmental sepsis meeting	(n=2)
Pediatric ED/Children's hospital meeting	(n=2)
Sick call coverage	(n=2)
Interview day tours	(n=8)

ED: Emergency Department, M3: third year medical student, M4: fourth year medical student, EMIG: emergency medicine interest group, EMS: emergency medical services, QI: quality improvement, FEMA/NIMA: Federal emergency Management Agency/National incident Management System, PFCCS: Pediatric Fundamental Critical Care Support

34 Resident Families: Improving Resident Wellness and Camaraderie: A Pilot Study

Reber R, Campana C, Simon E, Merrill R, Krizo J / Cleveland Clinic Akron General

Introduction/Background: Burnout is a work-related syndrome involving depersonalization, detachment, and a reduced sense of personal accomplishment. Wellness curricula during residency is aimed at providing physicians with the tools to create a sustainable work-life balance. Physician burnout (50%) ranks higher than many other professions. Emergency medicine reported one of the highest burnout rates at 48%. Therefore, it is critical to provide wellness support to physicians.

Learning Objective: To improve overall resident wellness, foster healthy coping skills, and improve peer support networks and camaraderie within an emergency medicine residency program.

Curricular Design: Residency families, modeled after undergraduate mentorship programs, were formed at the beginning of the academic year. Each consisted of one resident per class, one core faculty, and one clinical faculty member. Families were encouraged to meet outside of clinical duties. Additionally, residency wide wellness activities were arranged at least monthly. A ten question survey was distributed to measure resident wellness, assess the preliminary opinions of resident families, gauge interest in future activities, and determine areas of greatest interest. Monthly activities will be planned based on the indicated preferences, and a post-survey will be assessed at the end of the implementation period.

Impact/Effectiveness: Based on preliminary survey results, the majority of residents (57%) indicated that their home and work happiness are directly correlated. At the beginning of implementing resident families, participants revealed they felt supported at work (100%) and outside of work (77%) by fellow residents and 98% felt supported by attending physicians. Of respondents, 57% stated having a resident family has had a positive impact on their adjustment to life. The dimensions of wellness most interesting to residents are social (90.5%), physical (66.6%), and financial (61.9%).

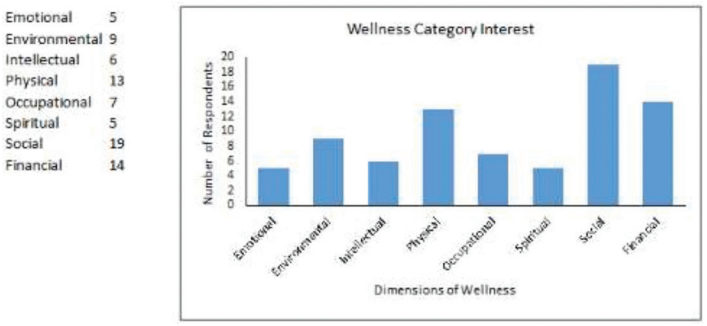


Image 1

35 Resident-Led Health Equity Curriculum

Cleveland Manchanda E, Chary A, Molina M, Dadabhoy F, Landry A, / Harvard Affiliated Emergency Medicine Residency, Boston, MA; Brigham and Women's Hospital, Boston, MA

Introduction: Resident physicians encounter many forms of discrimination directed towards patients and providers throughout their training. Resident-led initiatives to educate peers about health equity, implicit bias and microaggressions can increase awareness and skills for addressing these forms of discrimination, while creating peer support networks.

Learning Objective: This resident-led longitudinal health equity curriculum aims to 1) raise awareness of race- and gender-based inequities in resident and patient experience, and 2) build residents' skills in addressing inequities and microaggressions.

Curricular Design: Senior residents led a longitudinal five-session series (Health Equity Rounds) incorporated into the residency's yearlong didactic curriculum. Senior residents performed literature review and solicited resident-submitted experiences of diversity in our practice environment to teach residents and faculty about health equity, race as a social construct, forms of racism including implicit bias and microaggressions, and provided strategies for addressing

these topics. Quantitative (Table 1) and qualitative (Table 2) feedback was solicited through a survey with participating residents and faculty. The most useful sessions engaged residents in interactive discussions, leveraging their experiences to highlight how discrimination affects the work environment. Skill-building sessions facilitating practice of verbal interventions to address problematic interactions will be incorporated into future iterations of this curriculum.

Impact: Resident-led initiatives about diversity and inclusion educate not only peers but also faculty at their institutions. All participants reported increased understanding (Table 1), while many requested that these discussions continue (Table 2). Further work is needed to identify strategies to support residents, particularly those with underrepresented backgrounds, who pursue health equity work as clinicians and educators.

Table 1. Perception of Utility of Health Equity Retreat (n=29).

Reported increased understanding of residents' experiences of diversity in the workplace	100%
Found "Sharing Stories, Creating Definitions" very or extremely useful	94%
Found "Microaggressions Workshop" very or extremely useful	94%
Found "Verbal De-escalation of Agitated Patients" very or extremely useful	79%
Requested further training in:	
>Dealing with discrimination from patients	83%
>Best practices in hallway care	83%
>Implicit bias	59%
>Trans health	55%

Table 2. Dominant Themes from Open-Ended Survey Response (n=29).

Theme	Sample Quotes
Perceived Value	"Thanks for putting together an important training even though it can be uncomfortable at times." "So, so worthwhile." "Thank you for conducting the most thoughtful and effective professional development event that I have ever attended."
Perceptions of Format	"I liked the layout, plenty of time for audience participation and small group work." "I wish we could have had a report back for lessons learned and key discussions from the different groups."
Need for Continued Discussion	"I wonder how we keep these conversations going."
Involvement of Other Key Stakeholders	"I wish more faculty members had been there." "Next time we should have nursing come too." "The big unaddressed issue is that a lot of the tension comes from nursing…[nurses] are the front line when patients get aggressive."

36 Scholarly Work Jumpstart

McCabe K, Ranney M/ Boston Medical Center; Alpert Medical School at Brown University

Introduction/Background: The ACGME requires that residents participate in scholarly activity during training. Challenges to involvement in scholarly work include lack of experience or comfort with scholarship, and lack of early mentorship. Delayed exposure and participation can lead to less meaningful projects than desired.

Educational Objectives:

- Provide a scaffolding to assist in developing a topic of interest into meaningful scholarly work.
- Facilitate scholarship early in residency, in a supportive environment, with a structured mechanism to enhance the project.
- Facilitate networking to assist with moving projects forward.
- Develop a curriculum to facilitate early resident involvement in meaningful scholarly work.

Curricular Design: The Scholarly Work Jumpstart (SWJ) Program, inspired by the SAEM Lion's Den event, was adapted to aid residents in developing, presenting and refining scholarly work. In the first phase, each PGY1 develops their topic of interest by answering five questions that frame the topic as a problem to be solved, then discuss it at their June semi-annual review. (Table 1) During the second phase, the PGY2 residents present their five minute jumpstart proposal to students, residents, and EM faculty, followed by five minutes of questions. (Table 2) Presentations conclude with offers from the audience to help refine the project, collaborate, or help with networking.

Impact/Effectiveness: Two classes have completed the SWJ. The structured tool was used effectively by PGY1s. The diverse audience provided dynamic discussion. Providing a deadline enhanced early involvement in scholarly work, and the templates increased the substantiveness of resident scholarly projects. Resident and faculty consensus is that this format is meeting the educational objectives. Several SWJ project abstracts and manuscripts have been submitted for peer review. While it is too early to say if there has been a significant increase in overall scholarly productivity, the SWJ provides a timeline and format to engage in meaningful work.

Table 1. Scholarly Work Jumpstart Application.

1) Project Title (make it catchy, if you can)
2) What's your question?
3) What is the unmet need that your project will address (BACKGROUND/SIGNIFICANCE)?
4) What's your vision for answering the question? How are you going to solve this unmet need (RESEARCH PLAN/ METHODS)? If you have already started to work on this project, please share with us what you have done.
5) What is your metric of success (MEASURES/OUTCOMES)?
6) What personal resources do you bring to this project?

Table 2. Scholarly Work Jumpstart Presentation Framework.

-Convince us that your topic is worthwhile, your approach is good, and you are worth mentoring or collaborating with. Have some fun with your presentation (or keep it serious...your choice)!
-5 areas to cover (1-2 slides for each)

1) Title

2) Background
3) Methods
4) Outcomes
5) Your qualifications

-You have 5 minutes maximum to present your idea. You will be timed, and cut off, if necessary.
-You will have 5 minutes of commentary and questions from the panelists and the audience, with the goal of finding mentorship in this process itself. What you do with the offer is up to you! You can commit to your idea, find someone else whose project you like better to work with, opt in with someone who is looking for help on a pre-existing project, or scrap your idea in favor of a new one.

37 Sim/QI: A Novel Simulation Based Curriculum for Meaningful Achievement of Resident Patient Safety Milestones

Weber L, Leifer J, Shin-Kim J, Pathak S, McNamara S / NYU/Bellevue

Introduction/Background: There is a gap between the idea of "work as imagined" and the reality of "work as done" that hinders QI work's impact. Resident physicians are often experts in "work as done." The ACGME requires that residents learn patient safety competencies. Sim-QI is a resident elective that shows a novel way to both teach high yield patient safety skills and to improve local clinical processes.

Learning Objective: The learner will:

1) Use the IHI Quality Improvement (QI) Essentials Toolkit to assess local procedural practice.
2) Incorporate simulation (sim) into the QI process.
3) Identify opportunities for QI and share with leadership.
4) Achieve a high level of expertise on ACGME Milestone 16.

Curricular Design: This two week Sim-QI elective curriculum used the Institute for Healthcare Improvement (IHI) QI Essentials Toolkit in conjunction with in situ sim to improve a local process. Learning activities included: attending hospital safety meetings, participating in a team in-situ sim scenario, and guided asynchronous digital learning. Together, sim faculty and the learner designed a local QI needs assessment process focused on the central venous line (CVL) procedure. The learner implemented a QI needs assessment through an observational, cross-sectional, case series study with mixed methods at one ED. Methods included video-recorded in situ sim procedures, direct observation of clinical procedures, standardized interviews with interprofessional staff directly involved in vascular access. Data were used to create a Failure Modes Effect Analysis (FMEA) and process map. These were shared with clinical leadership. The resident assessed the elective experience using a standardized program assessment, and their work was reviewed for achievement of the Patient Safety milestone.

Impact/Effectiveness: The learner created a CVL process map (Fig.1) and an FMEA table (Fig. 2). The main opportunity identified was the need for a central line cart. This data will also inform curricular development for an upcoming health system wide CVL training initiative. We envision that this novel Sim-QI curricula can be applied broadly to other procedures and practices, and could be used in other EM programs to both improve workflows and build QI competencies.

Figure 1. Process Map

Steps in Process	Failure Mode	Failure Causes	Failure Effect	Likelihood of Occurrence (1-10)	Likelihood of Detection (1-10)	Severity (1-10)	Risk Profile Number (RPN)	Actions to Reduce Occurrence of Failure
Alert nursing staff about procedure	-Nurse unavailable -New nurse unfamiliar with procedure and responsibilities	-Staff shortage -High number of new staff	-Missing materials - inefficient time spent -Missed steps due to lack third party observer	6	8	2	96	-Train new nurses on CVL procedure -Make policy that nursing needs to be present for specific times of procedure (ex. Time out, set-up) - Address low RN staffing
Gather Materials: kit, bundle, ultrasound, sterile probe cover, chloraprep, sterile caps, mayo stand	-Delay in finding materials especially sterile probe covers, caps, kits -Materials not in ED	-ED not well stocked with sterile central line materials -Multiple locations where materials could be found -High staff turnover (residents and nursing)	-Delay in central line placement -Removing materials from trauma slot and emergency ward (unavailable for critical case)	10	5	6	300	-Create bundle/kit combo that has all necessary components other than US and mayo stand and have it readily available in same place in ED -Create central line cart
Wipe down US probe and use US to find target vessel and ID carotid/lung prior to sterile procedure	Not wiping down probe Not tracing vein Not ID proper landmarks	-Forgetting to wipe down or lack or knowledge -Lack of experience or training finding target vessel and ID carotid/lung - Wipes not available	-Risk of infection, (CLABSI) -Carotid cannulation -Pneumothorax (PTX)	7	8	5	280	-Have probe wipes with each US machine -Include in checklist
Prep kit for use: -Draw up lidocaine - Flush all ports and cap - Remove needle and wire caps	-Missing any steps listed -Missing materials -Faulty materials	-Multiple steps to remember -Possibly multiple operators -Lack of experience/training	-Air embolism -Kinked wire during procedure -Need for new kit mid-procedure, possibly introducing higher risk infection	3	5	8	120	-Checklist procedure - study line failures ona systemic level to identify common themes in cases where complication occurs - SIM CVL placement -Supervision by senior resident, attending
Attending in room for needle in to wire out	-Resident not getting attending -Attending unavailable	-Busy ED -Multiple sick patients -Unaware of policy	- improper placement - PTX - CLABSI	5	4	5	100	-Make all staffs aware of policy (email, central policy platforms) -Checklist in time out

Figure 2. Excerpt from Failure Modes Effects Analysis - note multiple steps in process not displayed in this excerpt

38 Simulation First 5 for Emergency Medicine Interns: Critical Actions in Managing Unstable Patients

Kahl N, Rudolf F, Fernandez J, Schwartz K, Oyama L / University of California, San Diego

Introduction: Emergency Medicine (EM) interns begin residency with variable preparation for ACGME milestones and comfort in managing clinical emergencies. Despite this variability, it is not uncommon for EM interns to be the first provider to evaluate unstable patients.

Learning Objective: To rapidly and effectively prepare emergency medicine interns for the initial management of unstable patients using a standardized, five-step algorithmic approach to minimize cognitive load.

Curricular Design: We developed 10 simulation scenarios focused on the initial management of unstable patients with common, undifferentiated chief complaints, including: anaphylaxis with angioedema, acute bronchospasm with hypoxia, STEMI, sepsis due to pneumonia, acute pulmonary edema with hypoxia, massive GI hemorrhage, hyperkalemia, opioid intoxication, agitation, and seizure. The algorithmic approach focused on recognizing a "sick" patient, appropriately seeking help, performing a primary survey, requesting IV access and non-invasive monitoring, developing a differential diagnosis, obtaining relevant initial tests, and initiating resuscitation. Groups of five interns (alternating team leaders) ran each five minute scenario, followed by ten minute debriefing sessions facilitated by EM faculty. Instructors advocated for an algorithmic, five step approach, listed critical and dangerous actions, encouraged self-reflection and provided real-time feedback. All interns completed course evaluations.

Impact/Effectiveness: This "First 5" simulation curriculum has been implemented in our EM internship orientation since 2012. Course evaluations were completed by the majority of participating interns, who rated the course greater than 4 on a 5-point Likert scale, and reported greater confidence and better preparedness in the independent initial management of unstable patients. Future innovations include documenting level 1 EM Milestones and entrustable professional activities for interns who complete the curriculum.

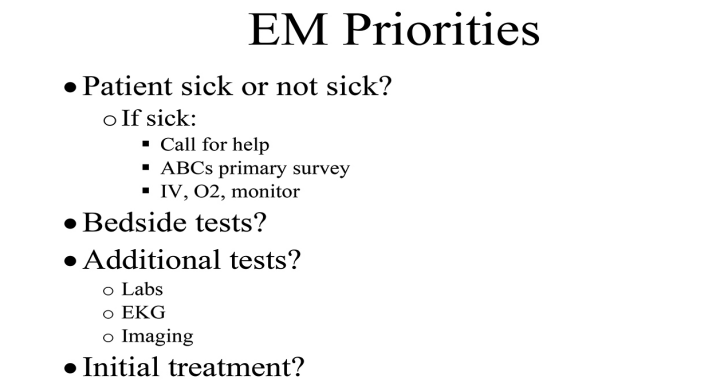


Figure 1. Sample Slide.

39 Slack® Intern Curriculum (SIC): A MedEd Innovation for Social Media

Huls T, McLean M, Cotarelo A, So E, Anana M, Chen A, Chien G, Chung A, Kulkarni M, Park J, Cygan L / St. John's Riverside Hospital; Rutgers New Jersey Medical School; Icahn School of Medicine at Mount Sinai Program NY; Jacobi-Montefiore Emergency Medicine Residency; Maimonides Medical Center; NewYork-Presbyterian Brooklyn Methodist Hospital

Introduction: There are few clinical experiences for newly-matched EM "pre-interns." Many arrive to their first shifts feeling unprepared for clinical work. We designed a social media based curriculum with the goal of improving pre-intern perceived preparedness (PP) and clinical knowledge (CK) using ACGME Milestones.

Educational Objectives: The objective was to ease the transition from medical school to internship by creating curriculum designed to illustrate several ACGME EM Milestones. A secondary goal was to spark clinical discussions with the participants and the session moderators. To increase the clinical knowledge and feeling of preparedness of newly matched EM Interns.

Curricular Design: Levels I and II of the Milestones in Table 1 were selected. 10 clinical cases addressing the most Milestones were composed in the form of Slack posts with text information, visual cues, clinical questions, and answers.

SIC was implemented at 11 EM residency programs. Subjects completed pre- and post-curriculum surveys assessing PP, CK, and curriculum feedback.

Impact: 151 pre-interns invited to participate. 115 and 63 pre-interns completed the pre- and post-curriculum survey respectively. Increases in PP were found for Milestones 5, 9, 10, and 12. (Table 2). While median reported preparedness was unchanged in some skills with a significant p-value, the Mann Whitney U test demonstrates a shift in the distribution of responses. There was no difference in mean exam scores after the curriculum, but there was an improvement in Milestone 10 CK.

Conclusions: SIC improved PP and some aspects of CK in pre-interns based on several topics in ACGME Milestones in EM, and allowed participant collaboration with co-interns despite geographic barriers. Limitations include variable participation and 45.2% lost-to-followup rate. Implementing the SIC may be beneficial for easing the transition to EM residency.

Table 1. Pre and Post Test Self-Reported Preparedness (1-5), Mann-Whitney U Summary Table.

Milestone Skill	*Pre-Test Median*	*Post-Test Median*	*p-value*	*U*
Recognizing Abnormal Vital Signs	4	5	0.3203	5790.5
Recognizing the Unstable Patient	4	4	0.7041	5548.5
Ability to form a Diagnostic Plan	4	4	0.6987	5244
Determining the Need for Diagnostic Studies	3	3	0.1954	5921.5
Ordering Appropriate Diagnostic Studies	3	3	0.9941	5401
Interpreting Results of Diagnostic Studies	3	3	0.6568	5580
Constructing a Differential Diagnosis	4	4	0.1598	4851.5
Recognizing Classes of Medications and Mechanisms of Action	3	3	0.2798	4944.5
Selecting Appropriate Medications	3	3	0.09773	6080
Recruiting Appropriate Clinical Resources	3	3	0.07565	6141.5
Making Admission or Discharge Decisions	3	3	0.1949	5939
Assigning Admitted Patients to Appropriate Level of Care	3	3	0.07112	6153
Describing Pertinent Anatomy for Specific Procedures	3	3	0.1363	6020.5
Describing Indications, Contraindications, Complications of ED Procedures	**3**	**3**	**0.002479**	**6661**
Describing Upper Airway Anatomy	**3**	**3**	**0.03268**	**6294.5**
Identifying Procedure Equipment and Technique	**2**	**3**	**0.001295**	**6745.5**
Identifying the Pharmacology of RSI Medications	**2**	**3**	**0.002792**	**6654.5**
Ability to Confirm Placement of ET Tube	**3**	**4**	**0.004147**	**6607.5**
Recognizing Indications for Ultrasound Imaging	4	4	0.2576	5864
Ability to Optimize Ultrasound Images	**2**	**3**	**0.01651**	**6418**
Interpretation of Ultrasound Images	3	3	0.3639	5783

Table 2. Pre and Post Test Self-Reported Preparedness (1-5), Mann-Whitney U Summary Table.

Milestone Skill	*Pre-Test Median*	*Post-Test Median*	*p-value*	*U*
Recognizing Abnormal Vital Signs	4	5	0.3203	5790.5
Recognizing the Unstable Patient	4	4	0.7041	5548.5
Ability to form a Diagnostic Plan	4	4	0.6987	5244
Determining the Need for Diagnostic Studies	3	3	0.1954	5921.5
Ordering Appropriate Diagnostic Studies	3	3	0.9941	5401
Interpreting Results of Diagnostic Studies	3	3	0.6568	5580
Constructing a Differential Diagnosis	4	4	0.1598	4851.5
Recognizing Classes of Medications and Mechanisms of Action	3	3	0.2798	4944.5
Selecting Appropriate Medications	3	3	0.09773	6080
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Describing Pertinent Anatomy for Specific Procedures	3	3	0.1363	6020.5
Describing Indications, Contraindications, Complications of ED Procedures	**3**	**3**	**0.002479**	**6661**
Describing Upper Airway Anatomy	**3**	**3**	**0.03268**	**6294.5**
Identifying Procedure Equipment and Technique	**2**	**3**	**0.001295**	**6745.5**
Identifying the Pharmacology of RSI Medications	**2**	**3**	**0.002792**	**6654.5**
Ability to Confirm Placement of ET Tube	**3**	**4**	**0.004147**	**6607.5**
Recognizing Indications for Ultrasound Imaging	4	4	0.2576	5864
Ability to Optimize Ultrasound Images	**2**	**3**	**0.01651**	**6418**
Interpretation of Ultrasound Images	3	3	0.3639	5783

40 Standardization and Documentation of Critical Event Debriefing: A Framework for Resident Engagement in Inter-professional Quality Improvement

Hitchner L, Sawtelle Vohra S, Uller J / UCSF Fresno

Learning Objective: To fulfill the ACGME requirement for resident engagement in inter-professional quality improvement while realizing the known benefits of formalized debriefing.

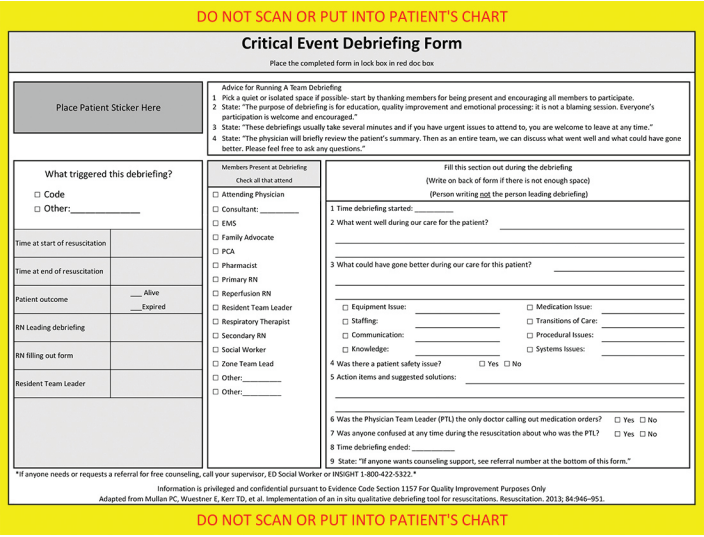
Abstract: Critical event debriefing facilitates inter-professional education, emotional processing, and quality improvement. Prior studies show that debriefings are underutilized and many departments do not have a formalized program despite recommendations by the American Heart Association. When implemented, debriefings are rarely documented and threats to patient safety are often lost to follow-up and remain unaddressed.

In the winter of 2017, we created a multidisciplinary critical event debriefing committee comprised of Emergency Medicine faculty, residents, nurses, and case managers.

Critical event debriefing forms were adapted from the Debriefing in Situ Conversation after Emergent Resuscitation Now tool described by Mullan et al after a detailed literature review of best practices.

During a critical event debriefing, the interdisciplinary team is prompted to identify what went well in the care of the patient, what could have gone better, whether there was a patient safety threat, and to propose solutions to improve care. Residents work with the ED operations committee to address the action items identified during debriefings.

The first critical event debriefing session was completed in March of 2018 and 38 forms have been completed to date. Debriefing sessions identified issues with equipment (23), communication (9), transitions of care (5), medications (2), procedural skills (2), systems (1), and medical knowledge (1) and created explicit action items with suggested solutions. Many of the third (5/10) and fourth (8/10) year residents have participated in a debriefing session and all residents have been included in discussions on proposed solutions. This project improves patient care, satisfies the ACGME requirement for resident engagement in inter-professional quality improvement, and is easily adaptable to other residency programs.


DO NOT SCAN OR PUT INTO PATIENT'S CHART

Critical Event Debriefing Form

Place the completed form in lock box in red doc box

Place Patient Sticker Here

Advice for Running A Team Debriefing
1 Pick a quiet or isolated space if possible- start by thanking members for being present and encouraging all members to participate.
2 State: "The purpose of debriefing is for education, quality improvement and emotional processing: it is not a blaming session. Everyone's participation is welcome and encouraged."
3 State: "These debriefings usually take several minutes and if you have urgent issues to attend to, you are welcome to leave at any time."
4 State: "The physician will briefly review the patient's summary. Then as an entire team, we can discuss what went well and what could have gone better. Please feel free to ask any questions."

What triggered this debriefing?
☐ Code
☐ Other:_____

Time at start of resuscitation	
Time at end of resuscitation	
Patient outcome	___ Alive ___ Expired
RN Leading debriefing	
RN filling out form	
Resident Team Leader	

Members Present at Debriefing
Check all that attend
☐ Attending Physician
☐ Consultant: _____
☐ EMS
☐ Family Advocate
☐ PCA
☐ Pharmacist
☐ Primary RN
☐ Reperfusion RN
☐ Resident Team Leader
☐ Respiratory Therapist
☐ Secondary RN
☐ Social Worker
☐ Zone Team Lead
☐ Other:_____
☐ Other:_____

Fill this section out during the debriefing
(Write on back of form if there is not enough space)
(Person writing not the person leading debriefing)

1 Time debriefing started: _____
2 What went well during our care for the patient? _____
3 What could have gone better during our care for this patient? _____
☐ Equipment Issue: _____ ☐ Medication Issue: _____
☐ Staffing: _____ ☐ Transitions of Care: _____
☐ Communication: _____ ☐ Procedural Issues: _____
☐ Knowledge: _____ ☐ Systems Issues: _____
4 Was there a patient safety issue? ☐ Yes ☐ No
5 Action items and suggested solutions: _____
6 Was the Physician Team Leader (PTL) the only doctor calling out medication orders? ☐ Yes ☐ No
7 Was anyone confused at any time during the resuscitation about who was the PTL? ☐ Yes ☐ No
8 Time debriefing ended: _____
9 State: "If anyone wants counseling support, see referral number at the bottom of this form."

If anyone needs or requests a referral for free counseling, call your supervisor, ED Social Worker or INSIGHT 1-800-422-5322.

Information is privileged and confidential pursuant to Evidence Code Section 1157 For Quality Improvement Purposes Only
Adapted from Mullan PC, Wuestner E, Kerr TD, et al. Implementation of an in situ qualitative debriefing tool for resuscitations. Resuscitation. 2013; 84:946–951.

DO NOT SCAN OR PUT INTO PATIENT'S CHART

Figure 1. Critical Event Debrieding Form.

41 Teaching Outside the Box: A Health Humanities-Based Curriculum to Teach Social Determinants of Health

Balhara K, Irvin N, Regan L / Johns Hopkins University School of Medicine

Introduction: Understanding the impact of social determinants of health (SDoH) is important to EM resident development. Successful SDoH training should bridge classrooms and EDs by providing frameworks for translating knowledge to clinical application. The health humanities (HH) may serve as that bridge. While their impact on medical students' empathy and observation skills is widely established, there is limited evaluation of their impact in resident education and potential to promote critical thinking about SDoH.

Learning Objective: The objectives of this curriculum are to:

1) Encourage critical thinking about social determinants (SDoH) in EM
2) Foster meaningful engagement with patients, families, and communities
3) Promote self-reflection on clinical experience
4) Translate knowledge of SDoH into patient care

Design: Grounded in narrative medicine and visual thinking strategies, curriculum themes were identified by a consensus group of residents and faculty with HH, education, and social EM expertise, with input from nursing and patient councils. Feedback from 6 pilot sessions informed the format and duration of this 10-session, synchronous and asynchronous year-long curriculum. After an introductory museum-based session to encourage out-of-the-box discussion, subsequent sessions are themed by specific SDoH (addiction, health literacy, built environment, etc) and combine brief lectures with group discussions of thematically-relevant literature and art in both classroom and community settings.

Impact: This innovative approach encourages critical engagement with SDoH in the ED and surrounding community, creating a cognitive bridge between didactics and clinical practice. Over 80% of residents have rated sessions as "excellent". Residents' group discussion participation and evaluation responses demonstrate engagement, nuanced discussion, and critical thinking. We will compare pre- and post-surveys to assess impact on SDoH knowledge and SDoH use in clinical decision-making. Tips for effectiveness are in Table 1.

Table 1. Lessons learned for maximizing effectiveness of a health humanities-based SDH curriculum.

• Schedule in-conference activities earlier in the year to encourage attendance at subsequent asynchronous sessions
• Limit any pre-readings to a maximum of two to maximize nuanced discussion
• When possible, incorporate time for reading into sessions themselves to maximize engagement
• Incorporate multiple sources in each session (for instance, combine art, literature, non-fiction, podcasts)
• When possible, involve multidisciplinary stakeholders, such as peer recovery counselors, social workers, and patients, in both curriculum development and instruction
• Move the classroom beyond the walls of the hospital to surrounding communities via community field trips or visits to museums

42 Ultrasound-Guided Mystery Key Identification: An Emergency Medicine Learner Module

Mead T, Sekhon R, Schurr H / Central Michigan University College of Medicine

Introduction/Background: Point-of-care ultrasound (POCUS) is ideal for integration into learning at both the undergraduate and graduate medical education levels. Opportunities to practice transducer manipulation are often limited early in physician training. This learner module allows practice with basic ultrasound techniques using gamification to open a locked chest.

Learning Objective: Learners will be able to: develop skill with manipulation of an ultrasound transducer; identify features of a structure with ultrasound imaging; and apply problem solving skills to select the correct key to open a locked chest.

Curricular Design: This learner module is designed to enhance problem solving skills and provide a hands-on experience with ultrasound transducer manipulation. During the ten minute session, the learner is provided with written instructions, 7-10 metallic keys and a locked wooden chest (Figures 1-2). A copy of the correct key to open a lock on the chest is hidden within a gelatin phantom. Learners describe characteristics of the correct key utilizing ultrasound-guidance. With correct identification, the learner will open the locked chest, successfully completing the module. Performance will be assessed on number of attempts to successfully identify the correct key. While preparing for initial implementation, the phantom material was changed from gel wax to gelatin to improve image quality. The position of the key was also adjusted in the gelatin to improve visualization.

Impact/Effectiveness: This learner module was implemented at a community academic residency during September 2019 as one of several hands-on simulation stations. Initial experience utilizing the module revealed its practical use as an engaging way to practice POCUS. Verbal feedback was positive from both medical student and resident learners. This module can be inexpensively reproduced and may be especially useful for learners early in their POCUS education.

Out of the many keys you see, all you need are three
To know which ones you seek, give the phantom gel a peek
For within the gel lie the matches, of those that unlock the latches
But make sure to be quick, to find the ones that do the trick
For every second points are lost,
and an unfortunate victim's life it may cost

Figure 1. Mystery Key Instructions.

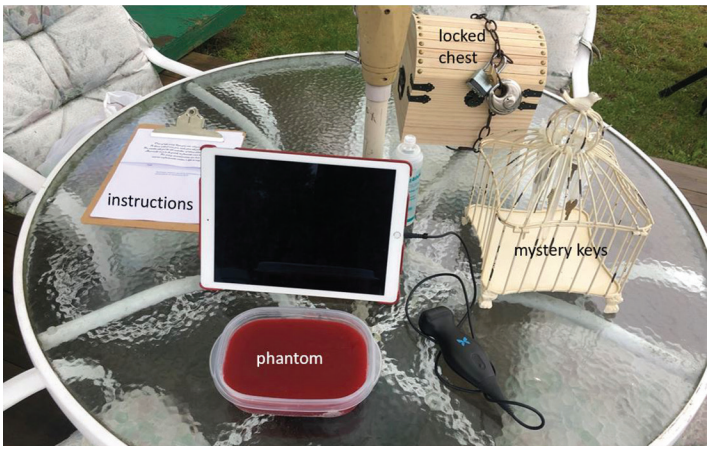


Figure 2. Mystery Key Station Setup

43 Wellness Coaching for Emergency Medicine Residents: an Individualized Approach to Resident Well-Being

Freeman B, Long J, Veeramasuneni Y, Sanderson Brown S, Contardo C / Spectrum Health Lakeland Emergency Medicine Residency; Spectrum Health Lakeland, Psychiatric and Psychological Specialties

Introduction/Background: Activities to address resident well-being tend to lack individualization. ACGME CLER Program guidelines require wellness to be addressed, however lectures on the various aspects of well-being can be too generalized and not truly applicable. Our program attempted to reconcile this in a way that was comprehensive and personal.

Learning Objective: To develop a program to improve resident wellness and provide the necessary tools to maintain wellness in the future.

Curricular Design: We initiated a wellness program that featured individualized Wellness Plans and utilized clinical psychologists as Wellness Coaches. Participants were voluntarily invited to complete an initial confidential validated Stanford Physician Wellness Survey, the Holmes-Rahe Life Stress assessment, the Professional Quality of Life Scale and a 22-item Lakeland EM Wellness survey. From these assessments they developed a Daily Self Care Plan that addressed the six dimensions of wellness: physical, emotional, spiritual, intellectual, environmental, and social. Residents met with their Wellness Coach between 2-4 times during the year. Additionally, the Wellness Coaches conducted four group sessions with the residency as a whole. After completion of the pilot year, residents completed the same assessments and an eight-item completion survey to evaluate the effectiveness of the program.

Impact/Effectiveness: Overall, 24 residents participated in the study. Post-completion resident surveys show an

average improvement of 1.9 points on a 0-10 scale on perceived overall well-being after course completion. 86% of residents stated they were satisfied with the program and 88% would recommend the program to fellow residents. 88% would continue to participate in the program. Based on our pilot year data, our methods appear to be very effective at promoting well-being. Our program could be used as a model for any residency program.

44 Who's the Boss? In-situ Inter-Professional Assessment of Resident Leadership Skills

Hitchner L, Sawtelle Vohra S / UCSF Fresno

Learning Objective: To provide real-time inter-professional assessment of resident leadership skills and to use this assessment to better inform individual progress on the ACGME Team Management milestone.

Abstract: The ACGME requires that residents are evaluated on their ability to effectively lead patient-centered care teams. Timely feedback is critical for practice improvement and yet residents don't often receive this formative information during shifts. Standardized direct observation tools have proven valuable for assessment of Emergency Medicine (EM) residents and who better to provide feedback on team management skills than the actual team? We standardized our critical event debriefing process to enable the inter-professional care team to provide direct feedback on resident leadership.

In the winter of 2017, we implemented a critical event debriefing program. EM residents, faculty, EMS personnel, nurses, techs, respiratory therapists, social workers, pharmacists, and consultants are asked to participate in the debriefings. During a session, the inter-professional group is asked, "Was the Physician Team Leader (PTL) the only doctor calling out medication orders?" and "Was anyone confused at any time during the resuscitation about who was the PTL?" Residents receive the direct real-time feedback and this data is collected and reviewed by residency leadership.

The first critical event debriefing session was completed in March of 2018 and 38 forms have been completed to date. Eighteen residents have been the PTL. In three cases, the team concluded that the PTL was not the only doctor calling out orders and that someone was confused at who the PTL was during the event. As we collect more data, we will compare these responses to the current ACGME Team Management milestone evaluations and use this data to inform future assessments. This innovation leverages a debriefing documentation tool to provide real-time inter-professional assessment of resident leadership skills. This can be applied to other milestones and easily implemented at EM programs around the country.

45 Women Trainees Experience Improved Residency Satisfaction Through Women Faculty and Resident Professional Development Sessions

Hosmer K / Wake Forest University

Introduction/Background: The experience of women residents in emergency medicine differs from those of their male counterparts. Women residents feel there is a deficit in topics specific to women in EM. Women residents are seeking mentoring, networking, peer support and professional development opportunities specific to them. Providing an established program to support these needs can improve the residency experience for women residents.

Learning Objective:

- Provide peer support, networking opportunities, and advising for women residents.
- Improve residency/career satisfaction through an established community of women EM physicians.
- Develop a variety of career skills to help women residents reach their career goals.

Curricular Design: A survey of all women residents in a single EM residency program was performed to determine the need for education and discussion of professional development topics specific to women in EM. The survey identified top areas of interest for discussion which included work-life balance, leadership skills, advice for the new attending, contract negotiations, and burnout/job satisfaction. A group of women faculty and residents meets every two months to discuss the assigned professional development topic with a faculty facilitator. Women residents are scheduled off from the ED during these meetings to allow for attendance. Small group discussions led by a faculty facilitator with specific discussion questions initially occurs, with a larger group discussion afterward.

Impact/Effectiveness: Women trainees have noted an improvement in morale, peer support, confidence and residency satisfaction through these sessions. Trainees and faculty have also identified specific areas for improvement within the program and department which have initiated changes.

Best of the Best Oral Abstracts

1 Association of Videolaryngoscopy Utilization and Junior Trainee Intubation Attempts: A National Emergency Airway Registry Study

Runde D, Mohr N, Christians B, Baker O, Carlson J, Golz D, Cook S, Pallin D, Fantegrossi A, Brown C / University of Iowa Hospitals and Clinics; Brigham and Women's Hospital and Harvard Medical School; Allegheny Health Consortium; Saint Vincent Hospital, Allegheny Health Network; Department of Emergency Medicine; Saint Vincent Hospital

Learning Objective: We seek to determine whether there is any association between the frequency with which videolaryngoscopy (VL) is utilized at particular institutions and the proportion of first intubation attempts given to junior trainees.

Methods: We performed a secondary analysis of prospectively collected observational data in the National Emergency Airway Registry from January 1, 2016 to December 31, 2018. The primary outcome measure was the percentage of first and second attempt intubations performed by intubators at the PGY1 training level, stratifying institutions by quintile according to the proportion of VL intubations they performed. We performed logistic regressions to see if increased hospital-level VL use is associated with a higher likelihood of first or second attempt intubation being performed by PGY1. We calculated and graphed the estimated proportions of PGY1 intubations and corresponding 95% CI for each quintile using marginal estimation methods. We reported general descriptive statistics as well odds ratios with cluster-adjusted 95% confidence intervals.

Results: 19,071 completed intubations were recorded at 25 institutions, 156 (0.8%) did not record a device, of which 18,897 were first attempt intubations, 2,315 were second attempt and the remaining 645 were third or attempt or higher. We found the proportion of first attempt PGY-1 intubations was 6.89% in the first quintile, 13.44% in the second, 13.39% in the third, 18.32% in the fourth and 8.67% in the fifth. We fit logistic regressions to estimate associations between institutional ranking of percent first attempt VL and percentage of PGY1 first and second attempt intubations at that institution. We found that relative to first quintile, institutions ranked in the fourth quintile of VL intubations are significantly more likely to have first attempt and second intubation performed by a PGY1 level intubator with ORs of 3.03, (95% CI 1.62 - 5.65) and OR 1.94, (95% CI 1.09 - 3.44).

Conclusion: This analysis shows an association between higher institution-specific utilization of VL and a higher rate of either PGY-1 first attempts or PGY-1 second attempt intubations.

2 Emergency Medicine Career Outcomes and Scholarly Pursuits: The Impact of Transitioning From a Three-year to a Four-year Niche-based Residency Curriculum

Ehmann M, Klein E, Kelen G, Regan L / Johns Hopkins University, The Johns Hopkins University School of Medicine

Background: Emergency Medicine residency programs exist in both three- and four-year training formats, the majority of which are three-year programs. It is unclear what impact training program length may have on residents' scholarly activity and longer-term career goals. In 2008, our residency transitioned from a three-year to a four-year training format.

Objectives: We hypothesized that a three-year to four-year curriculum format change would lead residents to be more scholarly productive and more frequently attain academic jobs and leadership positions in their first post-residency positions. To determine the effect changing our EM residency program from a three- to four-year format had on residents' likelihood of being scholarly productive and attaining an academic job and leadership role in their first post-residency position

Methods: This was a retrospective analysis of residents (N=95) who graduated from a single residency program that underwent a curriculum change from a three-year to a four-year training format. Three cohorts prior to (N=36) and five cohorts after (N=59) this transition were included. The primary outcome of interest was the setting (academic or not) of graduates' first post-residency position. Secondary outcomes included completion of scholarly activity during training and attaining a leadership role in the first post-residency position.

Results: Of the four-year program graduates, 44% obtained an academic position vs 28% of three-year program graduates. After controlling for confounders (gender, test scores, additional advanced degree(s)), this difference was not statistically discernible (OR 2.14 [95% CI, 0.72-6.32]). Residents in the four-year format had a higher likelihood of producing scholarly work by graduation (OR 8.51 [95% CI, 2.28-31.78]) and of obtaining a leadership position immediately after graduation (OR 12.65 [95% CI, 2.02-79.36]).

Conclusions: Compared to three-year residency graduates, graduates of our four-year curriculum were more likely to produce scholarly work and to secure a leadership position immediately after graduation.

Table 1. Impact of the change to a four-year program on academic or leadership position and scholarly output, OR (95% CI).

	Academic position*	Peer reviewed publication at graduation	Peer reviewed publication, one year post-graduation	Leadership position**	Publications & presentations	Academic position excluding fellowship	Peer reviewed publication at 48 months†
Four-year program	2.14 (0.72-6.32)	3.86 (2.06-7.23)	8.79 (2.37-32.62)	12.65 (2.02-79.36)	8.51 (2.28-31.78)	3.32 (0.94-11.71)	3.24 (1.44-7.30)
Advanced degree	4.31 (1.60-11.60)	2.45 (0.72-8.28)	3.55 (0.87-14.42)	3.48 (1.16-10.44)	1.06 (0.29-3.82)	3.29 (1.23-8.80)	2.84 (0.84-9.62)
USMLE Step 1§	1.03 (0.99-1.07)	1.00 (0.98-1.02)	0.98 (0.96-1.01)	–	1.03 (0.98-1.07)	1.02 (0.99-1.05)	1.00 (0.98-1.03)
Female	1.62 (0.59-4.44)	1.91 (0.94-3.88)	1.62 (0.69-3.81)	2.28 (0.93-5.60)	0.36 (0.07-1.82)	2.08 (0.76-5.71)	1.75 (0.85-3.61)
N	92	92	92	92	81	92	92

All data stated as odds ratios with 95% confidence interval (in parentheses). ** USMLE was collinear with four-year program and so was dropped; † Compares publication at graduation for four-year program and one year after graduation for three-year program; §USMLE, United States Medical Licensing Examination; *OR,* odds ratio; *CI,* confidence interval.

3 Impact of Medical Students Notes on Emergency Department Billing

Trinco D, Takacs M, Bailey O, Bobb Swanson M, Harland K, Obr B / University of Iowa Hospital and Clinics; University of Iowa

Background: On 2/2/18, the Centers for Medicare and Medicaid Services (CMS) announced a revision allowing teaching physicians to use student documentation for billing if the teaching physician verifies the documentation. There is limited data on the efficacy of medical students notes used in billing for Emergency Medicine. While more institutions are permitting billable medical student notes, the effects have not been studied.

Objectives: The aim of the study is to compare the change in Emergency Department efficiency, measured in relative value units (RVUs), when notes were written by medical student (2019) compared to resident/attending (2018). We predict medical student notes are as effective or superior to resident or attending physician notes. A secondary aim is to determine whether the number of notes written by medical students has changed. To understand the impact of the Centers for Medicare and Medicaid Services rule change allowing medical students notes to be used for Emergency Department billing

Methods: This project is a retrospective before-after study in the ED of a tertiary teaching university. Notes with medical student authors were identified for the pre (3/2018-5/2018) and post (3/2019-5/2019) periods. This time period was selected as our institution adopted the CMS policy for utilizing the medical student note for billing in 01/2019. Outcomes included RVUs per note and number of notes written per medical student. Wilcoxon rank sum tests and generalized estimating equations clustered on note author assessed for pre-post differences in note quality (RVU) and quantity.

Results: After the intervention, there was a 0.32 increase (95%CI 0.13 to 0.51, p=0.001) in RVUs per note compared to before the intervention. Number of notes written per medical student was higher in the post-intervention group (median 51 notes [IQR: 42-57]) compared to the pre-intervention group (median 7 notes [IQR: 3-8.5])(p<0.001).

Conclusions: Medical student notes result in higher RVU totals after the CMS revision. Medical students wrote more notes when they were used for billing.

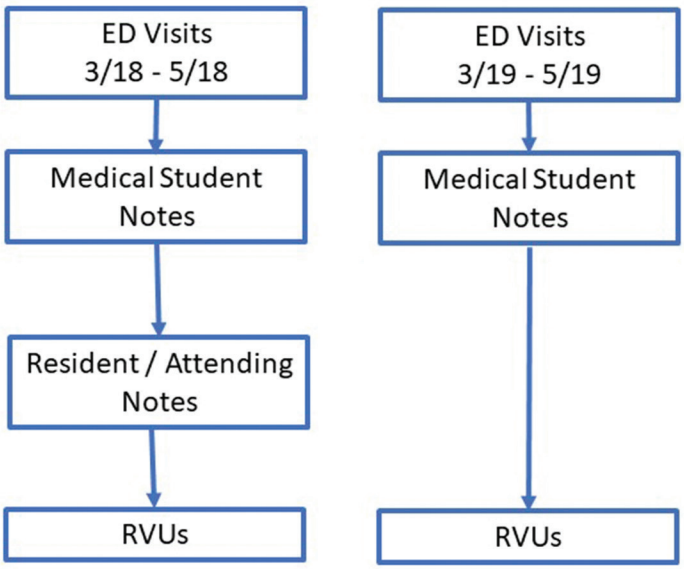


Figure 1.

4 Implementation of a Modified NCAT-EM shift card on Completion Rates of Assessments by Faculty in an Emergency Medicine Clerkship

Schlein S / University of Vermont

Background: One of the biggest challenges facing Emergency Medicine (EM) Clerkship Directors is acquiring meaningful clinical assessments from the faculty. Both at our institution and nationally return rates have been as low as 20% (Lawson eval). We created a modified NCAT-EM shift card that combines a validated nationally standardized tool in EM with a traditional shift card with which students themselves fill in patient initials, chief complaints, comments and procedures with a goal that this would inspire quality formative feedback and motivate improved compliance.

Objectives: Improve completion rates by using a new tool, a modified NCAT-EM shift card that combines a validated nationally standardized tool in EM with a traditional shift card. The primary objective in this study is to determine the impact of implementation a new EM Clerkship shift evaluation tool in an EM Clerkship. We aim to identify improvements in compliance rates as well as quality of data using the new tool in comparison to the prior electronic platform.

Methods: We reviewed data over 24 months in the pre-implementation period to determine a baseline. We present

the initial 6 months of post-implementation data. This is an implementation, time (AB) series design study, comparing data before and after changing to the modified NCAT-EM shift evaluation tool.

Results: A total of 1521 of the requested 3536 evaluations and a total of 947 of the requested 1081 evaluations were analyzed in 6 month post-implementation time period. Following our timeline pre implementation the average compliance rate From April 2017 through March 2019 was 43% (range 28-58%). Post implementation, over the 6 months following adoption of the modified NCAT-EM, the compliance rate improved to an average of 88% (range 82-94%). This shows a 104.6 % increase.

Conclusions: Implementation of the modified NCAT-EM shift card to acquire faculty evaluations of fourth year medical students on a required Emergency Medicine Clerkship showed an improvement in compliance from a baseline mean completion rate of 43% to 88% in the post-implementation period. Our strategy and tool was simple to implement, and offers an approach to improve compliance with faculty evaluations in the clinical setting.

5 The Effectiveness of Teaching Evidence Based Medicine to Medical Students Using a Journal Club Curriculum

Sena A, Kenney A, Moffett S / Rutgers New Jersey Medical School

Background: Evidence-based medicine (EBM) is identified by the Association of American Medical Colleges as an Entrustable Professional Activity for medical students entering residency, yet competency is only achieved 63.8% of the time in incoming residents. To help prepare students for residency, the ACE Tool--a validated instrument for assessing EBM competence--was used as an initial needs assessment to measure students' knowledge. The authors then implemented a new EBM curriculum in a mandatory fourth-year emergency medicine (EM) clerkship, using a weekly journal club format. This interactive "flipped classroom" module was selected to allow problem- and team-based learning and reflection on articles relevant to the current practice of EM, including endovascular intervention for stroke, contrast associated nephropathy, and the HEART Pathway. After implementation, the ACE tool was again used for assessment of the students' knowledge.

Objective: To determine if this curriculum effectively increased the knowledge of EBM in fourth-year medical students. The hypothesis was that ACE would be significantly improved. To determine if the implementation of an evidence-based medicine curriculum in the format of a journal club effectively increased the knowledge of evidence-based medicine in fourth-year medical students.

Methods: This study retrospectively examined and compared the ACE scores of all fourth-year medical students enrolled in the EM clerkship from June 2017 to May 2019, a total of 304 students. The EBM curriculum was implemented in June 2018. The distribution of scores was not normal, so a Mann-Whitney U test was used to look for a difference in ACE test scores.

Results: All eligible students were included in the study with none excluded. There was a statistically significant difference in mean ACE scores of students not exposed to the new EBM curriculum (60.4%) compared to those who were (68.7%) ($p < 0.00001$).

Conclusion: Our focused EM-clerkship-based EBM curriculum improved knowledge in fourth-year medical students, as measured by the ACE tool. This curriculum is feasible and effective and could be implemented at other institutions.

6 Using the QSAT to Generate Multi-Source Feedback on an In-Situ Pediatric Simulation Case

Kane B, Elliott N, Nguyen M, Cook M, Begany D, Macfarlan J, Morolla L, Matuzsan Z, Jong M, Partington S/ Lehigh Valley Health Network; University of South Florida Morsani College of Medicine; University of Pittsburgh

Background: Multi-source Feedback (MSF) is a suggested evaluation method by the Accreditation Council for Graduate Medical Education (ACGME). The Queen's Simulation Assessment Tool (QSAT) has been validated to discriminate between resident performances in a simulation (sim) setting. Our prior published work has demonstrated excellent inter-rater reliability (IRR) using the QSAT for MSF with an adult case in the sim lab.

Objectives: Using the QSAT, this study seeks to determine the degree of agreement of MSF on a single pediatric (peds) sim case conducted in-situ in the Emergency Department (ED).

Methods: This IRB approved study was conducted at a four year EM residency which trains 13 residents a year. A peds resuscitation case was developed with specific behavioral anchors on the QSAT, which uses a 1-5 scale in each of 5 categories. Data was gathered from each of 6 participants in the sim. The resident lead self-evaluated and also received MSF from each of a junior resident peer, a fixed peds ED nurse (RN), a random ED RN, and 2 faculty (one fixed, the other from a dyad). Reported are the mean scores and standard deviation (SD) for each. IRR is reported as Intraclass Correlation Coefficients (ICC) with 95% Confidence Intervals (CI) and are interpreted based on Cicchetti et al.

Results: The sim was run on 35 separate days over 2 academic years. Mean QSAT scores are in Table One. Table Two demonstrates ICC with fair IRR. Here all ICC CI's overlap, suggesting no statistically significant difference between sources of feedback. Removing self-evaluation led

to the highest IRR, achieving good consistency. IRR for any single or grouped non-faculty source of MSF was poor.

Conclusions: Using the QSAT, this single site cohort suggests that faculty must be included in MSF. The lower IRR in this cohort compared to our prior may be based on the case being peds in nature, the sim in-situ, or both. Self-evaluation appears to be of limited value in MSF.

Table 1. Mean QSAT Scores by Rater.

QSAT Variable	Self (n=35)	Fixed Attending (n=35)	Dyad Attendings (n=35)	Peer (n=34[b])	Fixed Nurse (n=33[c])	Random Nurse (n=34[d])
Primary Assessment *mean ± SD*	4.2 ± 0.6	4.4 ± 0.7	4.4 ± 0.7	4.8 ± 0.4	4.5 ± 0.8	4.7 ± 0.5
Diagnostic Actions *mean ± SD*	4.0 ± 0.7	4.0 ± 0.8	4.3 ± 0.7	4.4 ± 0.6	4.2 ± 0.9	4.3 ± 0.7
Therapeutic Actions *mean ± SD*	4.3 ± 0.7	4.2 ± 0.8	4.5 ± 0.8	4.8 ± 0.5	4.2 ± 0.9	4.5 ± 0.6
Communication *mean ± SD*	4.3 ± 0.7	4.2 ± 0.8	4.6 ± 0.6	4.7 ± 0.5	4.4 ± 0.7	4.4 ± 0.7
Overall Assessment *mean ± SD*	4.0 ± 0.6[a]	4.4 ± 0.6	4.2 ± 0.5	4.7 ± 0.5	4.4 ± 0.7	4.4 ± 0.6
QSAT Total *mean ± SD*	20.7 ± 2.6[a]	21.2 ± 2.5	22.3 ± 1.9	23.4 ± 1.9	21.7 ± 3.1	22.4 ± 2.4

[a]One self-rater did not answer Overall Assessment question, QSAT Total unable to be calculated for simulation, n=34.
[b]One simulation is missing data from a peer-rater, n=34.
[c]Two simulations are missing data from the fixed nurse rater, n=33.
[d]One simulation is missing data from the random nurse raters, n=34.

Table 2. Intraclass Correlation Coefficients (ICC) and 95% CI for Inter-Rater Reliability of Mean Total QSAT Score.

ICC Type	ICC 1	ICC 2	ICC 3	ICC 4	ICC 5	ICC 6
Inter-rater Consistency	0.570 (0.279-0.771)	0.429 (0.027-0.698)	0.557 (0.245-0.765)	0.538 (0.213-0.756)	0.608 (0.332-0.792)	0.411 (-0.028-0.693)
Inter-rater Absolute Agreement	0.531 (0.244-0.742)	0.377 (0.017-0.651)	0.538 (0.232-0.751)	0.488 (0.173-0.718)	0.579 (0.303-0.772)	0.364 (-0.027-0.650)

ICC 1: ICC for all raters.
ICC 2: ICC with fixed nurse raters removed.
ICC 3: ICC with peer raters removed.
ICC 4: ICC coefficient with random nurse raters removed.
ICC 5: ICC with self-raters removed.
ICC 6: ICC with all attending raters removed.

Educational Soundbites Abstracts

1 Clinical Event Debriefing Curriculum to Empower Residents to Resolve Patient Safety Issues in Emergency Medicine

Janairo M, Cardell A, Lamberta M, Elahi N, Koch N, Aghera A / SUNY Downstate, Maimonides Medical Center, Osceola Regional Medical Center, University of Vermont Medical Center

Background: EM ACGME program requirements stipulate that residents "actively participate in patient safety systems and contribute to a culture of safety," while programs should provide "formal educational activities that promote patient safety-related goals." They state feedback and experiential learning are "essential to developing true competence."

Learning Objective: To actively engage residents in an experiential process to analyze and correct systems factors uncovered through real time Clinical Event Debriefing (CED).

Curricular Design: During their Administrative Rotation, senior residents participate in a 2 hour CED workshop led by Simulation Faculty to provide a structured framework to analyze team performance and clinical systems with interprofessional staff. The first hour focuses interactive discussions of case studies in team performance and systems based error models and the second hour is designed to allow residents to practice a scripted CED format on videos of simulated events. Strategies to elicit proposed solutions to identified active and latent safety issues are stressed. Residents are tasked to perform 4 CEDs during their rotation, the first being directly supervised by the workshop facilitator. Aggregated issues and solutions were formally presented to operational leadership to codify a QI plan, which residents were tasked to help implement. Formative and summative feedback was provided by Simulation Faculty, and the Administrative Rotation director.

Impact/Effectiveness: Over a 2 year period, a total of 83 CEDs were led by residents. Examples of identified issues included inadequate communication, equipment failure, and deficiencies in protocols. Residents identified 124 issues and helped resolve 102 of them. Consistent with the ACGME mandate, CED provides a meaningful experiential platform for residents to promote a culture of safety by facilitating open dialogue amongst team members, reporting back to administration with systems issues, and taking an active role in resolving patient safety vulnerabilities.

2 Impact of a Paired Student-Resident Rotation Schedule on Medical Student Education and Impression of Residency Programs

Mansour I, Dyer S, Chhabra N / Cook County Health and Hospital Systems

Background: For many students, their ED rotation is their first exposure to emergency medicine and their first opportunity to evaluate a program as a fit for residency. Traditionally, shifts are scheduled with different residents and attendings and students receive little continuity in their education and are often unable to develop relationships for accurate evaluation.

Educational Objectives: We evaluated two different scheduling modalities- student-resident paired shifts vs unpaired shifts - and their effects on student education, ability to evaluate a residency program, and ability to showcase knowledge and skills. We sought to evaluate two different scheduling modalities-student-resident paired shifts vs unpaired shifts - and their effects on medical student education, ability to evaluate a residency program, and ability to showcase knowledge and skills.

Curriculum Design: For four months, all fourth year medical students (M4's) rotating through our ED spent two weeks in each format. During unpaired shifts, students were assigned shifts irrespective of any resident or attending schedule. During paired shifts, they worked with the same PGY-3 or 4

each shift. Students worked 7 unpaired shifts and 6 paired shifts, alternating which format took place first. Students anonymously completed a survey of likert scale questions and one free response area comparing the modalities and their impact on the quality of teaching, overall educational experience, ability to evaluate the program and the ability of the program to evaluate them.

Impact and Effectiveness: 48 M4's completed the survey with 66% of respondents feeling they were better able to evaluate us as a residency program through the paired format. This format improved educational experience, direct teaching time, fostered an environment in which students were comfortable asking questions and the perception that the program was able to better evaluate them as applicants. There was no significant difference in teaching time by attendings. Unexpectedly, while students overall preferred the paired format, many stated that the combination of the two schedules provided the best balance between maximizing education and getting to know the entire program.

Table 1.

	"More" or "much more" with resident schedule	No difference	"More" or "much more" with unpaired schedule
Which schedule format allowed you to receive more direct teaching time?	31/48 (64.6%)	13/48 (27.1%)	4/48 (8.3%)
Which schedule format allowed you to maximize your educational experience during the rotation?	33/48 (68.8%)	11/48 (22.9%)	4/48 (8.3%)
In which schedule format where you more comfortable asking questions about patient care and medical knowledge?	35/48 (72.9%)	12/48 (25.0%)	1/48 (2.1%)
Which schedule format allowed you to demonstrate your knowledge of emergency medicine better?	25/48 (52.1%)	20/48 (41.7%)	3/48 (6.3%)
Which schedule format allowed for more direct teaching time from attending physicians?	7/48 (14.6%)	32/48 (66.7%)	9/48 (18.8%)
Which schedule format gave you a better ability to learn about and evaluate the residency program?	32/48 (66.7%)	13/48 (27.1%)	3/48 (6.3%)
Which schedule format do you feel allowed the program to get to know you better as an applicant?	32/48 (66.7%)	11/48 (22.9%)	5/48 (10.4%)

3 Innovations in Airway Education: 3D Printed Neonatal and Pediatric Needle Cricothyrotomy Trainers

Hampton Z, Davis A, Kalnow D / OhioHealth Doctors Hospital

Introduction/Background: Pediatric needle cricothyrotomy is a rarely performed, yet high stakes procedure that is expected to be within the skill set of a training ED physician. Prior studies have shown benefit with low cost, low fidelity trainers, but there is scant amount of information discussing the production of a high fidelity trainer that remains at low cost. To bridge that gap we created a trainer that can be easily incorporated into simulation and hands-on training.

Learning Objective: The objective was to create a low cost, high fidelity pediatric needle cricothyrotomy trainer that increases the resident's ability to prepare and perform this difficult procedure.

Curricular Design: We used a .STL file from The Airway App, manipulating the design with Blender, a 3-D modeling program and Slic3r, to prepare it for 3D printing, creating scaled models at 50%, 33% and 25% of the original adult cricothyroid trainer (Image 1). A Pursa MK3 3D printer was then used to produce the scaled models.

Our goal was to create an evidence-based neonatal cricothyroid model in order to practice needle cricothyrotomy. Once printed, these trainers were used for resident simulation. SimSkin was placed over the trainers and residents performed the procedure with angiocatheters, syringes, and endotracheal tubes. All participants completed a survey after the simulation.

Impact/Effectiveness: Participants completed a post-simulation assessment survey in which comfortability was measured on a 1-5 scale, with 5 being completely comfortable in performing the procedure. Average pre-simulation and post-simulation scores were calculated and statistical analysis was completed using a single tail paired T-test. Average pre-simulation score was 1.87 and average post-simulation score was 3.57, for a median change of 2 ($p<0.05$). 96% of participants felt that the simulation was realistic and 100% of participants would recommend it for residents or attendings in the future (Table 1). Our data confirms the efficacy of this low-cost, high fidelity trainer in resident simulation.

Image 1.

Table 1.

	Participants	Comfort Pre Sim (1-5)	Comfort Post Sim (1-5)	Change	Was it realistic?	Is it valuable for other residents/attendings?
Totals	23	43	82	39		
Mean		1.87	3.57	1.70	96%	100%
Median				2		
Paired T-test (1 tail)				0.0000000002		

4 Putting The Fun Back in Teaching and Learning: A SIM Murder Mystery to Explore an EM Physician's Role as a Good Neighbor

Bodkin R, Spillane L, Pasternack J, Rotoli J, Lou V, Pereira J / University of Rochester Strong Memorial Hospital

Introduction: Instructor burnout and learner boredom can curtail engagement in educational activities and negatively impact learning. Although simulation is conducive to active learning, even this can become routine, particularly for the instructors due to the inherent repetition.

Learning Objective:

1. Improve active engagement of faculty and learners.
2. Prepare learners to respond in a non-traditional practice environment to household accidents/illnesses.
3. Understand the legal responsibilities, local resources, and liability one faces as a physician acting outside the workplace.

Curricular Design: Learners (EM residents, pharmacy residents and medical students) participated in a 6-station sim session working in teams to manage a grill explosion, drowning, fall down stairs, stab wound, ingestion and a neighbor with chest pain refusing transport. Debriefings included discussion of Good Samaritan laws, scene safety, at home stabilization and reinforced didactics covering EMTALA and EMS.

As an added twist, learners were asked to solve a murder mystery as some of these injuries were not accidents! Physical clues were scattered throughout the house, verbal clues were embedded in the scenario history and written clues were provided. Teams were given a game card to organize clues and figure out "who did it".

This five-hour sim session was conducted in a faculty members home using low fidelity mannequins and faculty acting as neighbors/victims. Each station was proctored by a faculty member tasked with conducting a debrief focused on the educational objectives for the case.

This activity was so realistic that several dog walkers attempted to call 911. We recommend placing "training in progress" warnings in the yard.

Impact: The faculty and residents provided session feedback that was overwhelmingly positive – learners were paying attention and the faculty was engaged in the fun. This training session has received institutional attention that has highlighted the creativity and engagement of our faculty.

Image 1.

Image 2.

5 Sign Out Down the Alley: A Novel Workshop-Based Approach to Teaching ED Transitions of Care

Simon A, DeAngelis M, Schreyer K, Blome A, Healy M/ Temple University Hospital Department of Emergency Medicine

Introduction: Transitions of care (TOC) are high-risk, yet residents receive little to no education regarding techniques to improve safety, communication and documentation during handoffs.

Learning Objective: To assess the effectiveness of a simulated serial handoff activity on residents' perceptions of the importance of education around TOC.

Curricular Design: Post graduate year (PGY) 1-3 residents were placed into teams of four and introduced in serial fashion to a low fidelity simulated clinical scenario. They proceeded to transition care in a "whisper down the alley" fashion, where each team member formulated a care plan and handed off to the next resident. Each subsequent TOC involved introduction of new clinical data. After each TOC, the residents involved documented the information given and received. Faculty facilitators also presented routine distractions. Afterwards, all participating residents discussed the initial clinical scenario and care plan. The group then reviewed the documentation for errors that were introduced over the course of the activity. Faculty facilitators then led a discussion on standardized documentation and how templates might be implemented effectively in the emergency department.

Impact/Effectiveness: The activity increased residents' perceptions of the value of education around TOC. 76.9% of respondents (n=13) reported that they had not previously participated in structured activities around TOCs and 92.3% said they did not use a standardized form of TOC. 100% found the activity useful. Residents stated that completing this activity would lead them to review patients' charts together, increase documentation after receiving a patient and increase efforts to ensure closed loop communication. Aggregated commentary regarding take home points and anticipated practice change is included in Table 1. 100% of respondents thought TOC education should be incorporated into the curriculum, ideally during orientation or the PGY1 year.

Table 1. Resident commentary on takeaways and anticipated practice change following the Sign Out Down the Alley workshop

What did you take away from the Sign Out Whisper Down the Alley activity?
"Sign out/transfer of care is extremely variable, contributing to its already high-risk nature. Should be more structured"
"It showed the big effects that small details in sign out can have, but also how a good sign out can remain the same for multiple hand offs"
"It's important to be clear and concise at sign out"
"To be more aware of pertinent questions to ask when getting sign out"
"How important things can get lost easily, to re-emphasize and stress what you think is the most important"
"It was a good example of the dangers of disorganized sign out as well as the difficulty of doing a good sign out with incomplete information and/or multiple interruptions"
"It made me more aware of how things get short-handed or papered over in sign out, especially on a patient who is in the early stages of work up"
"I think the big takeaway is that we don't have a consistent style of doing hand offs; when we are paying very close attention to one case it's good but in real life, it's not always so smooth."
"Emphasized how important a structured and standardized hand off is as the two groups had two pretty different final presentations!"
What, if anything, about your practices at patient hand offs will change as a result of this activity?
"Clear documentation; ED addendum TOC notes"
"Really to just be more mindful of pitfalls when signing out and to take a more standardized approach"
"Pulling up patients to review them together"
"Trying to be more clear and concise at sign out"
"Being more clear about what needs to be followed up when giving sign out and making sure to ask questions when receiving sign out"
"More structured"
"Closed loop communication, repetition"
"I will use a more structured sign out format going forward"
"It reminded me how important it is to try to write MDMs for patients prior to hand off so that I make sure not to leave out or overlook any key pieces of info"
"I think there was good emphasis on signing out a clear plan"
"Better hand offs"
"Using the hand off print out and an Epic sign out template more consistently, always synthesizing the hand off by the receiver"

6 Teaching Rapid Assessment Skills in Triage for the Emergency Medicine Clerkship

Rudolf F, Oyama L, Hayden S, Schwartz K, Fernandez J/ University of California, San Diego

Background: Rapidly assessing an undifferentiated patient and developing a gestalt for "sick vs not sick" is a core component of EM. Developing this skill requires clinical experience and honing an instinct, which can be difficult to attain during a typical EM clerkship. We propose that a teaching shift in triage provides a unique environment for students to demonstrate and learn rapid assessment skills.

Learning Objective: We developed a novel approach to teaching medical students rapid assessment of patients in the ED by implementing a teaching shift in triage.

Curricular Design: Medical students were scheduled one three-hour shift in triage during their EM clerkship. The teaching attending first role-modeled a targeted rapid assessment in triage. The student then assessed patients under direct supervision, discussed their immediate differential and proposed an initial workup. The attending gave real time feedback using a standardized direct observation tool. Students completed a pre and post survey (five-point Likert scale) to assess their comfort level in the following areas; performing a medical screening exam, determining "sick vs not sick", developing a targeted differential diagnosis, and ordering an initial diagnostic workup. Data was analyzed using a Wilcoxon Signed Ranks Test.

Impact/Effectiveness: Twenty-one students participated in the triage shifts in the fall 2019. There were significant improvements in self-assessments of all five survey areas (see Figure 1) ($p<.0001$). All students either strongly agreed or agreed that the triage shift was a worthwhile experience. Replicating this intervention requires securing attending time. We found benefits to the teaching attending included performing direct observation, giving real-time feedback, and targeted teaching moments on the fly. Additionally, an attending in triage can potentially decrease left without being seen and improve the operational efficiency of the ED.

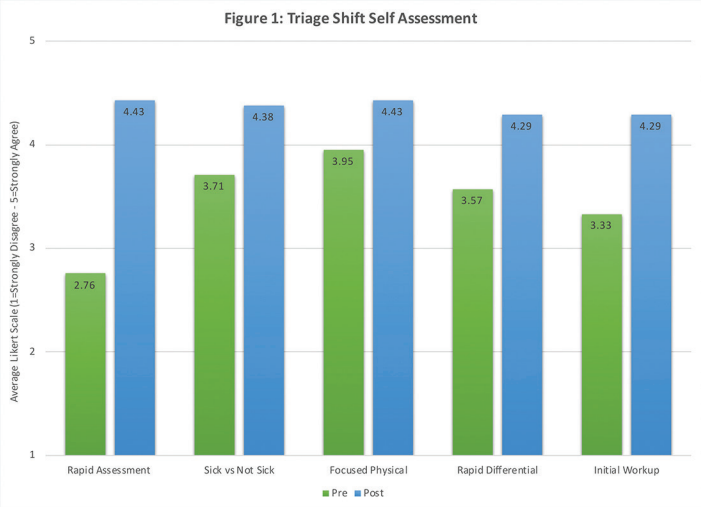


Image 1.

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