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Integrating Emergency Care with Population Health

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Advances in Education Research and Innovations

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 2021. 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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Kimberly Sokol, MD, MS, MACM; Lauren Bacon, MD

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Amber Billet, MD; Robert Clontz, MD; Hieger Michelle, DO


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Research Abstracts

1 3D-printed Larynx is A Cost Effective Substitute for Traditional Simulation Models to Teach EM Residents Cricothyrotomy

Ryan Spangler; Ali Aledhaim, PA-S1, MS, DrPH; Siamak Moayedi, MD

Learning Objectives: to compare the cost-effective and real-like experience of surgical cricothyrotomy between a 3D printed and prepared model compared to the (standard) trauma man simulator.

Methods: In a prospective crossover study, we compared the lifelike experience and cost effectiveness of surgical cricothyrotomy between a novice 3 Dimension (3D) trachea model and the trauma man simulator. The 3D model was prepared using silk tape and pig skin over the 3D model to create a cricothyroid membrane and skin. 27 emergency medicine residents and one medical student were recruited for participation. Each participant was randomly assigned to start with either the 3D model or the trauma man and then performed the procedure on the other simulated device. Participants filled out a survey post completion. Elements of interest were questions inquiring which device was most realistic and most useful. Cost analysis was based on the monetary value of each device for all participants. Pearson paired t-tests were used to compare the average realistic rating using STATA 15.1 (StataCorp LLC).

Results: The 3D model had a realist rating of 7.43 compared to 7.25 for the trauma man ($p = 0.57$). The average cost per participant was $0.50 for the 3D model compared to $100 for the trauma man ($p < 0.001$) with a total cost of $14 and $2,800 for each device, respectively.

Conclusion: Our study shows that the 3D tracheal model provides equivalent lifelike experience similar to the trauma man and is more cost-effective. It was associated with a cost reduction 99.5% (2800-14)/2800) compared to the trauma man utilization.

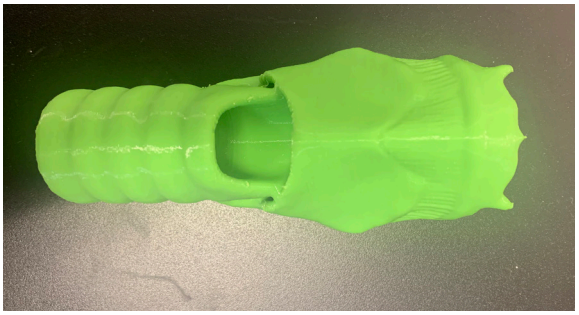

Figure 1.

2 A Geospatial Analysis of Gender Mobility in the Emergency Medicine Residency Match

Laura Hopson, MD; Meghan Mitchell, MD; Michelle Romeo, MD; Caroline Kayko, MLIS; Jeremy Branzetti, MD; Mike Gisondi, MD; Linda Regan, MD, MEHP

Learning Objectives: We compared movement between medical school and residency by gender. Our hypothesis was that women move a shorter distance than men.

Background: Women are underrepresented in EM leadership. Some evidence suggests geographic mobility improves career advancement.

Objectives: We compared movement between medical school and residency by gender. Our hypothesis was that women move a shorter distance than men.

Methods: We collected National Residency Matching Program (NRMP) lists of ranked applicants from 7 EM residency programs from the 2020 Main Residency Match. We added the gender expressed in interviews and left the Association of American Medical Colleges (AAMC) number as the unique identifier. Applicant data for matched osteopathic and allopathic seniors in the continental United States was included. We obtained street addresses for medical schools from an AAMC database and residency program addresses from the ACGME website. We performed geospatial analysis using ArcGIS pro and compared results by gender. NRMP approved the data use and our IRB granted exempt status.

Results: 881 of 944 unique applicants met inclusion criteria (830/1713 (48.5%) matched allopaths; 37% of all matched seniors); 420 (48%) were female. There was no significant difference between genders for distance moved ($p=0.31$). Women moved a mean 619 miles (SD=698, median 341, range 0-2679); men a mean 641 miles (SD=717, median 315, range 0-2671). Further analysis of applicants travelling less than 50 miles (49 women, 51 men) showed no significant frequency differences.

Discussion: Women and men travel similar distances for EM residency with the majority staying within geographic proximity to their medical school. This suggests that professional mobility at this stage is not a constraint for the majority of women. Our study findings are limited by lack of knowledge of factors informing relocation decisions such as location of family and couples matching.

Conclusion: Gender does not appear to affect decisions to relocate for residency training. This finding may have implications for resident selection.

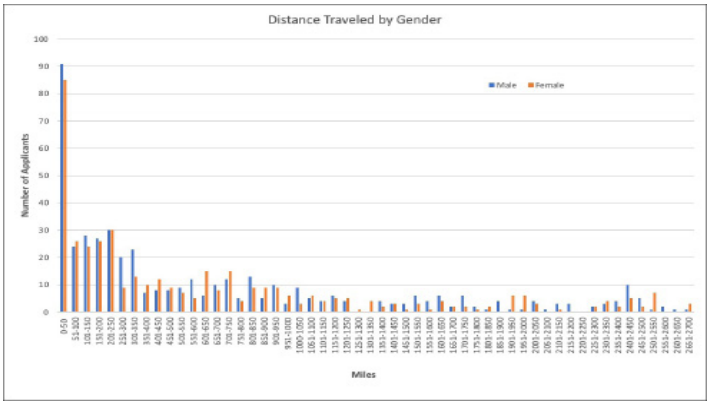

Figure 1.

3 A Mixed-Methods Needs Assessment to Identify Pharmacology Education Gaps Among Emergency Medicine Residents

Ashley Rider, MD; Brian Dang, PharmD; Kimberly Schertzer, MD; Holly Caretta-Weyer, MD, MHPE; Mike Gisondi, MD

Learning Objectives: The objective of this study was to perform a targeted needs assessment in order to develop a patient-safety focused pharmacology curriculum for EM residents.

Background: Medication errors threaten patient safety and half of all errors are related to physician orders. Emergency medicine (EM) residents are expected to demonstrate competence in pharmacotherapy (Milestone PC5), yet it is unclear which curricular topics to emphasize.

Objective: The study aim was a targeted needs assessment to develop a patient-safety focused pharmacology curriculum for EM residents.

Design: A convergent mixed methods study incorporated data from a de-identified safety event database and survey responses of EM faculty and clinical pharmacists at a single-site university hospital with 24-hour EM pharmacists. We reviewed the database to quantify types and severity of medication errors over 5 years. We identified survey participants using purposive sampling and obtained consent. Anonymous surveys included categorical items that we analyzed with descriptive statistics and short answer questions that two coders examined using thematic analysis. We summarized all data sources to identify relevant curriculum gaps.

Results: Common safety threats in our database were wrong dose (43%) and computer entry errors (14%). Survey respondents included 21 physicians and 9 pharmacists. Commonly identified knowledge gaps were medication cost (63%), pregnancy class warnings (60%), antibiotic stewardship (53%), medication interactions (47%), and side effects (47%). Qualitative analysis identified the need to optimize computer order entry, improve understanding of antibiotics and critical medications, better use references to guide prescribing, and know when to involve the pharmacist. Improved skills are needed when prescribing antibiotics, insulin, sedatives, narcotics, and epinephrine.

Conclusion: Pharmacology skills to emphasize in EM residency training include order entry, prescribing high-risk medications, antibiotic stewardship, utilization of references particularly for special populations, and consultation with the pharmacist.

Table 1. Responses to categorical survey questions.

Categorical survey questions	Most common topics reported (%reporting)
Top five knowledge gap topics	Cost of medications (63%) Medications in pregnancy and lactation (60%) Antibiotic selection and stewardship (53%) Medication interactions (47%) Familiarity with side effects (47%)
Associated with patient safety events	Pain management/opioids (43%) Insulin (37%) Sedation medications (33%)
Incorrectly ordered	Pain medications (40%) Antibiotics (30%) Insulin (27%)
Must-know side effects	EPS-inducing medications (23%) Ketamine (17%) Opioids (10%)
Dose should be memorized	RSI medications (60%) Epinephrine (43%) Vasopressors (27%) Sedation medications (27%)
Antibiotics incorrectly prescribed	Vancomycin (43%) Piperacillin-Tazobactam (30%) Trimethoprim/Sulfamethoxazole (27%) Cephalexin (27%)

4 A Qualitative Needs Assessment of COVID-19's Impact on EM Interns

Eric Lee, MD; Shivani Mody, DO; Arlene Chung, MD

Learning Objectives: To characterize the impact that COVID-19 has had on the well-being and educational experience of EM interns in 2020

Background: The COVID-19 pandemic posed an unprecedented challenge to our learners. EM interns this year began their training during a time of great need and with less clinical experience than those of prior years.

Objectives: To characterize the impact that COVID-19 has had on the well-being and educational experience of EM interns in 2020.

Methods: We conducted a 60-minute semi-structured focus group with 18 interns at a single residency program in July 2020. A recording of the interview was transcribed and de-identified. Using qualitative methods, initial coding was performed independently using an inductive and iterative process by two study authors with experience in qualitative methodology. Once

Table.

Themes	Representative Comments
Education	"I think there are challenges in pretty much every aspect of education and training, challenges in online format for didactics, where you are not learning in person but rather at home, there are challenges in socialization and bonding (which are normally part of training), because our training helps us feel comfortable with working with one another, with our colleagues, this impacts our training." "This conversation will be very different if there is a second wave in September or November and we stopped seeing appendicitis, kidney stones and we start seeing one COVID patient after the other for like a month or two. We stop rotating on other electives where we might have learned more about specialties but end up only learning about COVID. "
Professional Identity Formation	"I hate the healthcare heroes' concept. I hate that we have been shunted and labelled as such, as being forced into this army that is sacrificing their lives and that we didn't ask for this—I don't like the message that is being sent out regarding this." "I think that we are learning about how political our jobs are and that learning that a lot earlier on and that this is a context that we never saw this in before. I originally said that I don't like politics and that's why I went to medicine, but I realize that it's half my job."
Grief related to COVID-19	"We were unable to celebrate the end of our 4th year and our entire medical school experience, which we should have been through Match and graduation. It feels selfish to feel upset about these things, but these events are something we looked forward to the entire 4 years." "We weren't allowed to grieve for the fact that we missed all this stuff, rather we had to suck it up and remember that we signed up for this, and that it's okay we missed graduation. You are going to be doctors and everyone looks up to you, so missing graduation should not be a concern."
Mental Health	"I think a lot of the anxiety I felt about starting intern year, as it might be the hardest thing I have ever done and what if I start going down a dark place mentally." "In normal circumstances, I would be surrounded by people, building relationships, and have support if needed, but now we are in a time and place where we aren't encouraged to reach out or have relationships, but rather be isolated."
Physical Health	"In terms of this, we signed up for the risk, but the people we live with and the people that support us they haven't signed up for this risk." "I don't feel that I need to be better at this point, I just want to be careful."

saturation was achieved, final codes were re-applied by an initial coder and a third author. After consensus discussion, agreement reached 100%, and codes were grouped for thematic analysis.

Results: We identified two major themes: education and professional identity formation. Interns expressed concerns about the quality and breadth of their medical training during COVID. Interns also voiced frustration with the politicization of medicine and uncertainty about their roles as physicians during the pandemic. Minor themes included physical health, mental health, and grief related to COVID-19.

Conclusions: Our analysis suggests that new EM interns have significant concerns about their medical knowledge and the quality of their education as well as their identity as emergency physicians and public health advocates. These results may inform future decisions regarding dedicated support and training necessary for this unique group of learners.

5 A Year of Changes: Does Participation in Our Novel Curriculum Improve Medical Students Self Perception of Preparedness for Video Interviews

Matthew Ledford, MD

Learning Objectives: The goal of the study was to assess the effectiveness of our educational program on the students self perception of preparedness for video interviews. Use of mock interviews and a video tutorial increased how well students felt they were prepared for a video interview for residency.

Background: Because of recommendations related to COVID-19, programs across the breadth of medical specialties committed to video interviews for the 2020/21 interview season.

Objectives: To assess if there was a difference in students self perception of preparedness for video interviews before and after our educational program.

Methods: Medical students at our institution were offered to participate in two mock video interview days. A pre and post-survey was completed by students participating in the interviews. Students who participated in the first interview day were provided formal feedback prior to the second interview. Participating students were also provided a 15 minute instructional video on tips for a successful video interview between interview days 1 and 2. 78 respondents completed the pre-survey, 55 respondents completed the post survey. Of the post survey respondants, 46 participated in both interview days, 7 participated in one interview day and 2 did not participate in either interview day. Responses from those who did not participate in either interview were removed from the data.

Results: Students were asked to rate themselves on a scale from 0-100. Students self confidence in their ability to do well on a virtual interview for residency increased from 56 to 73 (30% improvement). Students confidence that they knew common questions they were likely to encounter during a residency interview increased from 47 to 73 (55% improvement). Students confidence in their ability to provide successful answers to common questions encountered during a residency interview increased from 53 to 72 (38% improvement). How well the student felt they were prepared for virtual residency interviews increased from 40 to 68 (70% improvement).

Conclusion: Use of mock interviews and a video tutorial increased students confidence in their ability to do well, know common questions, provide successful answers and their overall preparedness for video interviews.

6 ABEM Content Areas of EM Resident on Shift Evidence Based Medicine Questions

Shreyas Kudrimoti, BA; Estelle Cervantes, BA; Kashyap Kaul, DO; Phillip Sgobba, BS, MBS; William Spinosi, DO; Dawn Yenser, C-TAGME; Joseph Zackary, MD; Bryan Kane, MD

Learning Objectives: Using the American Board of EM (ABEM) 2019 Model of Clinical Practice of EM, describe EM resident on shift EBM questions.

Background: Evidence Based Medicine (EBM) skills allow EM providers to obtain and apply new information

while on shift in the ED. The clinical content of on shift EBM questions by EM residents has not been previously described.

Objective: Using the American Board of EM (ABEM) 2019 Model of Clinical Practice of EM, describe EM resident on shift EBM questions.

Methods: This IRB approved study was conducted by a PGY 1-4 EM residency. Residents are required to complete logs of on-shift EBM activity in the program's procedure software system New InnovationsTM (NI). The logs are a convenience sample, with an N of 3-5 per 28 day EM rotation. The logs include a patient description, clinical question, search strategy, information found, and subsequent application. Logs were coded to clinical content areas of the 2019 ABEM Model. The Model provided acuity definitions. ABEM special populations (pediatrics and geriatrics) were identified.

Results: From June 2013 until May 2020, 10,455 discrete completed logs were identified in NI. Table 1 demonstrates log proportion for each of the 20 ABEM content areas. Table 2 contains the most common specific sub-categories. "Emergent conditions" (N=7,770) were most commonly searched ABEM acuity, followed by "lower acuity" (N=5,341) and "critical" (N=5,192). Note, not all conditions have ABEM acuity codes, and some have multiple. Special populations were the source of on shift questions in logs 10.16% (N=1,061) for pediatrics and 8.05% (N=841) for geriatrics.

Conclusions: In this single site cohort "Procedures and Skills" were the most common source of on shift questions for EM residents, perhaps representing just in time training. Trauma was the most common sub-category and, along with toxicology, has a large content outline. Time on shift may have impacted acuity dispersal. Programmatic understanding of resident on shift EBM questions could serve to identify educational gaps and opportunities.

Table 1. EBM log assignments to the 2019 ABEM model of clinical practice.

ABEM Content Area	Number of Logs	Proportion of Total
1. Signs, Symptoms and Presentations	892	8.54%
2. Abdominal and GI Disorders	878	8.41%
3. Cardiovascular Disorders	991	9.49%
4. Cutaneous Disorders	263	2.52%
5. Endocrine, Metabolic, & Nutritional Disorders	292	2.8%
6. Environmental Disorders	142	1.36%
7. Head, Ear, Eye, Nose, Throat Disorders	559	5.35%
8. Hematologic & Oncologic Disorders	244	2.34%
9. Immune System Disorders	252	2.41%
10. Systemic Infection Disorders	472	4.52%
11. Musculoskeletal Disorders (Non-Traumatic)	303	2.90%
12. Nervous System Disorders	801	7.67%
13. Obstetrics and Gynecology	356	3.41%
14. Psychobehavioral Disorders	143	1.37%
15. Renal and Urogenital Disorders	375	3.59%
16. Thoracic-Respiratory Disorders	737	7.06%
17. Toxicologic Disorders	748	7.17%
18. Traumatic Disorders	861	8.24%
19. Procedures and Skills Integral to Practice of EM	1110	10.63%
20. Other Core Competencies to Practice of EM	25	0.24%
Totals	10,445	100%

Table 2. Most common ABEM model of sub-categorical identified in EBM logs.

Rank	ABEM Sub-Category	Number of Logs	Proportion of Total
1	18.1 Trauma	812	7.77%
2	17.1 Drugs and Chemical Classes	749	7.17%
3	1.3 General	527	5.05%
4	19.4 Diagnostic and Therapeutic Procedures	500	4.79%
5	3.5 Diseases of the Myocardium, Acquired	316	3.03%
6	16.4 Obstructive/Restrictive Lung Disease	268	2.57%
7	1.2 Pain	266	2.55%
8	3.3 Disorders of Circulation	263	2.52%
9	2.9 Large Bowel	251	2.40%
10	3.4 Disturbances of Cardiac Rhythm	239	2.29%
11	7.4 Oropharynx/Throat	223	2.13%
12	10.6 Viral	220	2.11%
13	13.3 Complications of Pregnancy	218	2.09%
14	19.5 Ultrasound	182	1.74%
15	16.6 Pulmonary Embolism/Infarct	176	1.69%
16	4.4 Infections	168	1.61%
17	16.7 Pulmonary Infections	164	1.57%
18	2.7 Stomach	163	1.56%
19	19.2 Resuscitation	162	1.55%
20	9.2 Hypersensitivity	159	1.52%
20	19.3 Anesthesia & Acute Pain Management	159	1.52%

7 An "Asynchronous" Curriculum: Learner Perspectives in the Time of COVID-19

Emily Wilkins, MD; Semhar Tesfai, MD; Alejandro Palma, MD; Adriana Segura Olson, MD, MA.Ed

Learning Objectives: To understand the EM resident perception of a newly introduced asynchronous curriculum during the COVID-19 pandemic and assess the effects of the curricular modification on convenience, retention of information, work/life balance, enjoyability, and overall preference for didactic format.

Background: Didactic education in EM residencies has been impacted by the advent of asynchronous learning (AL) and recently by a shift towards remote, web-based conference education due to COVID-19. Although studies demonstrate the efficacy of AL, few have focused on resident reaction to curricular modification and none have looked at resident reaction during the COVID-19 era. We implemented an asynchronous curriculum in the Spring of 2020 that replaced 20% of weekly didactics with one-hour's worth of online resources. After each module, resident-submitted learning points are reviewed in conference through gamification.

Objectives: This study aimed to evaluate resident perception of a newly introduced asynchronous curriculum. We hypothesized that a combination of didactic conference and AL is more valuable to learners than didactic conference alone, and that in the COVID-19 era of remote weekly conferences, AL is increasingly valuable to the learner.

Methods: A cross-sectional survey was administered online to residents of a 3-year EM program. The survey assessed how residents perceive in-person vs. remote didactics with and without AL. Questions addressed convenience, retention of information, work/life balance, enjoyability, overall preference, and whether residents would like the asynchronous curriculum to continue. Responses

were reported on a 5-point Likert scale.

Results: 32/48 (67%) residents participated. 100% would like the asynchronous curriculum to continue. 84.4% prefer in-person conference with AL to all in-person conference; 90.1% prefer remote conference with AL to all remote conference. Regardless of the modality, residents found that adding AL made didactics more convenient, better for retention of learning, better for work/life balance, and more enjoyable.

Conclusions: EM residents perceive asynchronous learning as a valuable addition to their didactic curriculum and find it even more preferable in the COVID-19 era of remote learning.

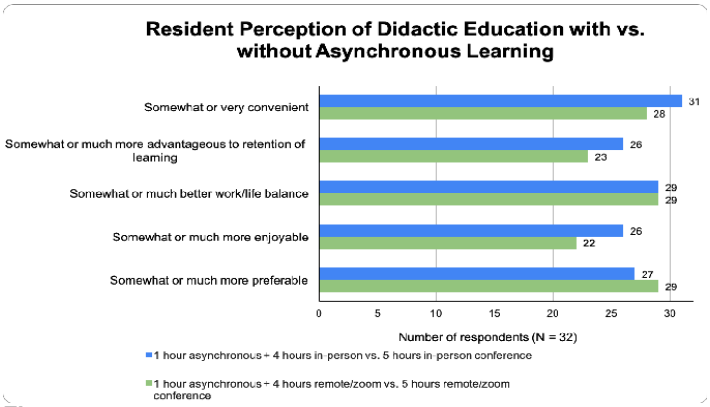

Figure.

8 Analyzing the Effect of Interview Time and Day on Emergency Medicine Residency Interview Scores

Alanna O'Connell, DO; Sean Greco, MS 2; Peter Tomaselli, MD; Megan Stobart-Gallagher, DO; Robin Naples, MD; Dimitrios Papanagnou, MD

Learning Objectives: To analyze whether interview date or time has an effect on residency interview score for applicants to Emergency Medicine residency programs.

Background: The residency interview is essential to successfully match to a residency program. There are many confounding factors to the match success. To date, no studies have examined the association between timing of interview and interview score.

Objectives: The authors sought to retrospectively analyze interview data over the past 3 years to determine if month of interview and time of day influence overall interview score. We hypothesize that overall interview score would not be affected by date of interview or time of day.

Methods: Data from a 3-year EM residency program in an urban academic medical center was examined. Interview data for 3 full interview cycles was reviewed. Interview raw scores, interview date, and time were analyzed. Time of day was created into 2 categorical variables: morning and afternoon. Data points were grouped according to date and time, with subsequent interview scores recorded adjacently. A regression analysis of the data points was then performed.

Results: There was no statistically-significant difference between date of interview or timing of interview on candidate's overall interview score. Findings correlate with similar studies in graduate medical education.

Conclusions: Our findings suggest that time of interview during the application season, as well as time of day, do not have a relationship with overall interview score. Findings should reassure applicants that a particular interview slot will not put them at a disadvantage in the match process. Future studies should include interview scoring rubrics from several other programs to ascertain the generalizability of our findings.

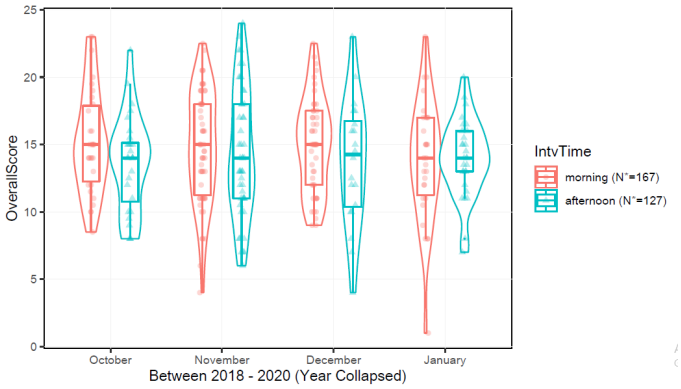

Figure 1. Displaying data from 2018-2020 (with years collapsed) interview scores and the months/times of day applicants were interviewed.

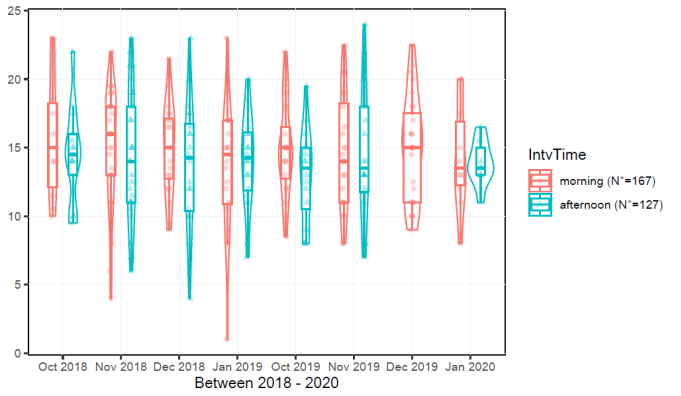

Figure 2. Displaying data from 2018-2020 (individual years) interview scores and the months/times of days applicants were interviewed.

9 Assessment of Horizontal Violence Towards Emergency Medicine Residents in a Single Academic Emergency Department

Ashley Jacobson, MD; Neha Raukar, MD, MS; Lisa Schlitzkus, MD; James Colletti, MD

Learning Objectives: The objective of this study was to

identify sources of horizontal violence (HV) toward emergency medicine residents. Our hypothesis was that women residents earlier in their training would experience more HV as measured by the Negative Acts Questionnaire-Revised (NAQ-R).

Background: Bullying is prevalent across multiple industries, including academic medicine. The majority of health care research in horizontal violence (HV) has been within the nursing field.

Objectives: The objective of this study was to identify sources of HV toward emergency medicine (EM) residents. Our hypothesis was that women residents earlier in their training would experience more HV as measured by the Negative Acts Questionnaire-Revised (NAQ-R).

Methods: This pilot study utilized a descriptive cross-sectional survey design to categorize HV. Participation was voluntary; all were residents in an ACGME-approved, three-year academic EM residency in Rochester, MN. Data was collected via electronic survey and occurred at the midpoint of one academic year.

Demographic information and responses to the NAQ-R were collected. It is subdivided into three categories of bullying: work-related, person-related, and physical intimidation. Residents were asked to answer 22 questions as it relates to their interactions with other residents and again as it relates to ancillary staff.

Results: A total of 23 of 26 residents responded (88%). Participants were 56% women, 78% white, 12% Hispanic, and 89% heterosexual. Clinical year was broken down into 39% first, 39% second, and 22% third year residents.

Women reported a higher frequency of HV compared to men ($p<0.001$). There was no difference in reported frequency of violence based on clinical year ($p=0.15$). By category, women indicated more frequent incidences of work-related violence, both from residents ($p=0.031$) and staff ($p=0.008$) and more incidences of person-related violence from staff ($p=0.038$).

Conclusion: Our pilot study demonstrates that HV toward EM residents exists with women experiencing more work-related and person-related violence. Limitations include small sample size and recall bias. Future endeavors should include larger scale studies with a more heterogeneous population.

10 Changes in Faculty Attendance at Resident Conferences After Transitioning to a Virtual Format

Travis Eastin, MD; Lauren Evans, MD; Amanda Young, MD; Meryll Pampolina, MD; Meredith von Dohlen, MD; Christopher Fowler, DO; Rachael Freeze-Ramsey, MD; Sarah Greenberger, MD; Carly Eastin, MD

Learning Objectives: Evaluate the effect of change from in-person to virtual resident conference on faculty attendance rates.

Background: The COVID-19 pandemic has forced many graduate medical education programs to move from in-person educational activities to a virtual format. Academic faculty are typically encouraged to attend resident conferences, but it is unclear if faculty attendance could be affected by these format changes.

Objectives: To examine changes in conference attendance after changing from in-person to virtual delivery. We hypothesized that faculty attendance would increase overall with the transition to virtual format.

Methods: This is a retrospective, observational study of faculty attendance at resident conferences between July 2020 to November 2020, abstracted from routinely collected conference records for 24 faculty. To reduce bias, this period was chosen due to changes in how conference attendance was recorded for faculty. Our exposure groups included faculty attending in-person conference versus virtual conference via Zoom©. The primary outcome was conference attendance. Calculations were performed using chi-squared testing.

Results: Overall, there were 1920 hours of conference, with 447 hours attended by faculty (23.3%). Attendance for in-person and virtual formats were 23.7% and 22.1%, respectively (Table 1). Comparison revealed no significant difference between conference format and conference attendance ($\chi 2 = 0.51$, p 0.47).

Conclusions: Faculty attendance at resident conferences did not change significantly after transitioning from in-person conference to virtual format. Limitations included a small sample size.

Table 1. Faculty attendance at resident conference with in-person or virtual formats.

Format	Attended	Not attended	Total	% Attended
In-person	341	1099	1440	23.7%
Virtual	106	374	480	22.1%

11 Changes in Resident Conference Attendance After Transitioning to a Virtual Format

Lauren Evans, MD; Amanda Young, MD; Meryll Pampolina, MD; Meredith Von Dohlen, MD; Christopher Fowler, DO; Rachael Freeze-Ramsey, MD; Sarah Greenberger, MD; Travis Eastin, MD, MS; Carly Eastin, MD

Learning Objectives: To examine changes in conference attendance across various methods of conference delivery: in-person, virtual conference, and virtual conference with a video-on requirement. We hypothesized that overall attendance would increase with the change to virtual format.

Background: The COVID-19 pandemic has forced many graduate medical education programs to move from in-person

educational activities to a virtual format. To our knowledge, little is known about how this format change impacts attendance.

Objectives: To examine changes in conference attendance across various methods of conference delivery: in-person, virtual conference, and virtual conference with a video-on requirement. We hypothesized that overall attendance would increase with the change to virtual format.

Methods: This is a retrospective, observational study of resident conference attendance from July 2019 to November 2020, abstracted from routinely collected records for all emergency medicine residents (n=30). Groups included residents attending in-person conference, virtual conference, and virtual conference with a camera-on requirement (Table 1). The primary outcome was conference attendance. An a priori subgroup analysis was performed to examine changes in attendance for the in-person format before onset of the pandemic versus during the pandemic. Chi-squared analyses were performed.

Results: Overall, there were 7800 hours of conference, with 5936 hours attended (76.1%). Attendance for in-person, virtual, and virtual with camera-on formats were 75.7%, 80.1%, and 69.5%, respectively (Table 2). A 3-way chi-squared analysis showed significant association between conference format and conference attendance ($\chi 2 = 29.3$, $p < 0.005$), with each 2-way comparison also being significant. There was no difference in in-person attendance before versus during the pandemic (75.1% vs 76.9%, $\chi 2 = 2.1$, $p = 0.14$).

Conclusions: Resident conference attendance significantly increased after transitioning from in-person to virtual format, but then decreased after adding a camera-on requirement. Limitations include crossing over academic years as well as smaller sample size of the virtual with camera-on format.

Table 1. Timeline of conference format changes.

Format	Time Periods
In-person	July 1, 2019 - March 4, 2020
Virtual	March 18, 2020 - June 30, 2020
In-person	July 1, 2020 - September 30, 2020
Virtual with camera on	October 1, 2020 - November 18, 2020

Table 2. Resident conference attendance among various conference formats.

Format	Attended (hours)	Not Attended	Possible Hours	% Attended
In-person	4271	1369	5640	75.7%
Virtual	1249	311	1560	80.1%
Virtual with camera on	417	183	600	69.5%

12 Characteristics of Traumatic Injury in Sexual Assault Patients

Denise Mccormack,MD, MPH; Sushi Subburamu, MD; Glenda Guzman, DHSc, PA-C; Carmen Calderon, LCSW; Ruchika Darapaneni, MS I; Robert Lis, MS I; Niloofar Sima, MS I; Jeremy Sperling, MD; Jill Corbo, MD

Learning Objectives: To characterize types of injuries commonly associated with sexual assault and identify risk factors for these injuries.

Background: The ED remains at the forefront for the treatment of sexual assault (SA) patients. Many of these patients require treatment for traumatic injuries sustained during the assault, which can range from mild to severe. The risk factors for traumatic SA remain unclear.

Methods: Electronic ED records were reviewed retrospectively from a high volume level 1 Trauma center and nearby community hospital from July 2019 to July 2020 for patients age ≥13 years with a chief complaint of SA. Descriptive statistics, chi square and logistic regression were used to characterize demographics and identify factors associated with trauma.

Results: 157 patients met inclusion criteria. The mean age was 27.9 years old (range 13-79 years) and 92.4% were female. Adult patients (age >18 years) comprised of 78% of assaults compared to adolescents (age 13-18 years) at 22%. The assailants of these sexual assaults were reported as 61.2% acquaintance, 22.9% stranger and 15.9% intimate partner (IP). In 8.9% of cases, the patient reported an attack by multiple assailants. 57 (36.3%) patients exhibited trauma on presentation. 30 (24.8%) cases involved alcohol use (P=0.95) and 22 (14%) reported a drug facilitated assault (P=0.64) but neither was statistically associated with trauma. Chi square analysis showed an association of trauma with adult age (P<0.05) and assault by IP (P<0.05). 45 (28.6%) patients had minor injury described as abrasions, lacerations or contusions. Major trauma occurred in 12 (7.6%) patients, which consisted of complex fractures and nonfatal strangulation. Logistic regression determined that assault by IP (OR=2.6, 95% CI 1.1-6.5) and being an adult patient (OR=3.0, 95% CI 1.1 - 7.7) increased the risk of trauma. Assault by IP also increased the risk of nonfatal strangulation (OR=4.0, 95% CI 1.1-15.4).

Conclusion: Traumatic injuries from SA were mostly minor. IP violence was found to be a key risk factor for trauma and findings of nonfatal strangulation.

13 Clerkship Student Perceived Educational Effectiveness of Virtual Simulation

Claire Paulson, DO; Jamie Allen, DO; Jessica Davis, DO; Julie Fritzges, DO; Deepak Jayant, DO; Michael Nguyen, MD; Colleen Urban, DO; Charles Worrilow, MD; Dawn Yenser, C-TAGME; Bryan, Kane, MD

Learning Objectives: To determine the perceived

educational efficacy of VS.

Background: High fidelity simulation (HFS) has been described as an effective tool in medical training. COVID 19 has led to educational gathering restrictions for both medical students (MS) and Physician Assistant students (PAS). In response, we offered MS and PAS education through a virtual HFS (VS) experience. Objective: To determine the perceived educational efficacy of VS.

Methods: This IRB reviewed study was conducted by a PGY 1-4 EM residency. Given COVID restrictions, virtual clerkship educational experiences, including VS were created. VS was conducted via WebEXTM. Previous in person HFS cases were streamed by on site personnel, including faculty and chief residents. Student leaders were assisted by teammates via chat in teams of 3. Students had a minimum of 3 VS. After rotation completion, either full virtual (FV) or patient care with virtual education (PC), MS and PAS were asked to provide anonymous feedback. The electronic survey consisted of the host network's standard Continuing Medical Education (CME) questions (Table 1). The Likert questions were analyzed descriptively with a value of 1 for Strongly Disagree (SD), 2 Disagree (D), 3 Undecided (U), 4 Agree (A), and 5 Strongly Agree (SA). Open ended questions were qualitatively analyzed.

Results: From 8/3/20-10/23/20, 79 students (58 FV, 19 PC) rotated. Due to scheduling conflicts, 14 were unable to participate leaving 65 VS participants (44 FV, 21 PC). A total of 46 replied (70.8% response rate). Table 1 demonstrates that VS was received overwhelmingly positively. Only 1 respondent replied that they would not recommend this activity to others.

Table 1. CME questions and analyzed responses.

Question	Analyzed Response
The objective(s) of this activity were met	4.71 (0 SD, 0 D, 0 N, 13 A, 33 SA)
The pacing of the activity was appropriate	4.59 (0 SD, 0 D, 1 N, 17 A, 28 SA)
The activity kept me engaged	4.76 (0 SD, 0 D, 0 N, 11 A, 35 SA)
I learned new knowledge from this activity	4.85 (0 SD, 0 D, 0 N, 7 A, 39 SA)
I will be able to apply what I have learned to my job	4.85 (0 SD, 0 D, 0 N, 11 A, 35 SA)
I would recommend this activity to others	4.82 (0 SD, 1 D, 0 N, 5 A, 40 SA)
This activity will improve my job performance and productivity	4.59 (0 SD, 1 D, 1 N, 14 A, 30 SA)
What about this activity was most useful to you?	Several students commented on the usefulness of acting as a leader and playing the role of a physician, as well as the feedback and review provided at conclusion of the cases. They also appreciated the realistic environment and scenarios that were created. In addition, students enjoyed being put in stressful situations and working as a team to put their knowledge into practice. Others commented on the extra experience and practice that is provided.
What about this activity was least useful to you?	Common responses included N/A, difficulties seeing the patient monitor and inherent difficulties with the virtual process (lack of actual patient touch/ inability to perform a physical exam, lagging of computer quality, etc.) and the procedure demonstrations.
How can we improve this activity to make it more relevant?	Many responses included N/A, having physician leads perform an example case, improve clarity of monitor/ EKGs/imaging presented over the web cam. One student mentioned adding metrics for team members in addition to the team leader, more structured debriefing.
Please provide any additional comments you may have. (e.g., speakers, content, facilities, cases, etc.)	Common responses included thanking the team for putting together the activity, suggesting making the monitor more clearly visible.
What are you going to change in your practice as a result of this educational activity?	Major themes included students having a more 'structured' approach, including utilization of a safety net (IV, O2, Monitor, POCT glucose, urine HCG) and assessment of ABCs. Second, students expressed they would be more careful to maintain a broad differential rather than 'anchoring' on a single diagnosis. Additionally, students reported they would strive to share their thoughts with the rest of the team throughout a patient's course of treatment and they would remember to utilize family and EMS for history that may be useful to the patient's diagnosis and treatment.
State any barriers to implementing this change.	Most responses were N/A, but also limitations placed by computer/ virtual aspects and inability to see live patients in their current level of training.

Positives include perceived realism, experience and teamwork. Ability to view the monitor was a theme for improvement.

Conclusions: This single site cohort indicates that VS is an effective, well received education tool for students unable to access a sim center. Further research is needed to compare VS to an in-person simulation experience.

14 Comparing Resident Procedures in Urban vs. Rural Emergency Departments.

Nicholas Carey; Scott Findley, MD; Hannah Davis, MPH; Brian Dilcher, MD

Learning Objectives: Comparing procedures EM residents perform at urban vs. rural emergency departments can help identify strengths or weaknesses of utilizing rural sites for residency training.

Background: Rural rotations can be a valuable experience for EM residents. To date there has not been a retrospective cohort study to compare procedures performed at Urban vs. Rural EDs.

Objectives: The purpose of this study was to compare procedures performed by EM residents in urban vs. rural EDs, with the hypothesis that there will be no significant difference in procedures performed.

Methods: A retrospective cohort study was conducted comparing procedures performed by 2nd and 3rd year EM residents based on medical chart review. Procedures were counted at three locations including a rural critical access ED, a large rural (community) ED, and an Urban (Academic) ED. Procedure notes were collected from September 2018 to September 2019. Final analysis included nine months, as three months did not have residents at all locations. Eight procedures were standardized based on number of procedures performed per 100-hours worked by residents. Comparison of total procedures and complex vs. simple procedures was performed. A Kruskal-Wallis H test was preformed to compare resident hours for procedures between each of the three locations. To compare each of the hospitals to one another separately, Mann Whitney U tests were performed.

Results: The total resident hours worked included 1,800 at the small rural ED, 13,725.5 at the urban ED and 5,319 at the large rural ED. A p-value of 0.0311 for the Kruskal-Wallis H Test indicated a difference between at least two of the ED sites. A statistically significant difference exists (p-value 0.0135) between the urban ED (95% CI 0.15-0.62) and the large rural ED (95% CI 0.54 -1.53). There was no significant difference in complex vs. simple procedures among the three locations (p-value 0.4159).

Conclusions: When compared to the urban ED, residents performed more total procedures at the large rural ED, and similar total procedures at the small rural ED per hours worked.

15 Comparison of Intubation Barrier Devices in a Simulated Airway Task Trainer

Nur-Ain Nadir, MD; Nathan Stuempfig, DO

Learning Objectives: We aim to demonstrate a preferred device to be used for physician protection during the intubation of Covid-19 patients using a simulated model. In addition, we wish to demonstrate which device causes the least interference with the intubation process.

Background: With the advent of the SARS-CoV2 (Covid-19) pandemic, there have been significant concerns regarding transmission of the disease to Healthcare Professionals, particularly during intubation procedures. Several forms of barrier protection aimed at decreasing the spread of aerosolized droplets were developed during the early onset of the pandemic.

Objectives: Using a simulated airway task trainer, we examined the impact that 3 separate barrier devices had on intubation time and success using both direct and video laryngoscopy. We hypothesized that lighter and more simplistic devices would be preferred and would provide faster intubations.

Methods: The subjects of this study comprise of attending level emergency physicians and anesthesiologists employed at a community hospital who were asked to fill out surveys regarding their experience with the barrier devices from previous simulated intubations. In addition, 10 attending level emergency physicians participated in a Just in Time training session in which they performed both direct and video laryngoscopies on an airway task trainer using each of the devices. An independent observer recorded the time it took for each physician to set up the device and to successfully intubate the task trainer.

Results: The main results of the survey are depicted in Figure 1a-d. 97 percent of respondents indicated a preference for video laryngoscopy for Covid-19 positive patients. In general, this cohort preferred a plain clear plastic drape or clear plastic drape with PVC cube for direct laryngoscopy and video laryngoscopy set ups (Figure 2a-d). Use of these two devices resulted in significantly faster times to intubation when compared with the fiberglass box.

Conclusion: In general, a simple, plastic sheet was the preferred barrier device using video laryngoscopy. Although set up times were faster using the fiberglass box, intubation times were significantly faster using the plastic drape or PVC frame.

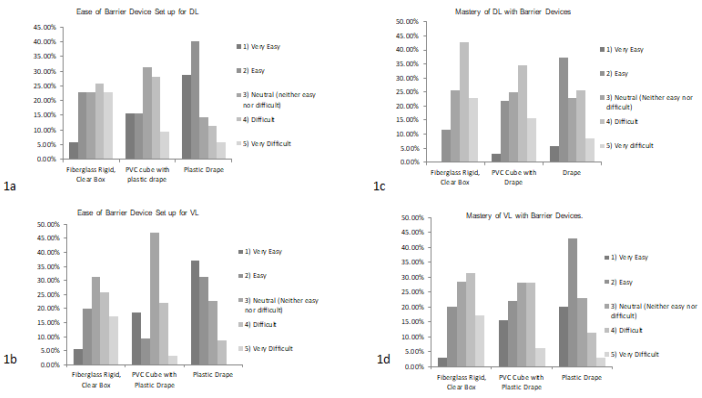

Figure 1.

Figure 2.

Barrier Device Type	Plastic Drape		PVC Cube with Plastic Drape		Fiberglass Box	
Average Time (s)	Direct	Indirect	Direct	Indirect	Direct	Indirect
Device setup	32	30	42	39	10	9
1st pass intubation	46	39	46	41	57	52
BVM	43	42	40	42	60	65

16 Continuing Professional Development: A Needs Assessment for Emergency Medicine Faculty

Anne Katz, Kriti Gogia, MPH; Neel Naik, MD; Kaushal Shah, MD

Background: To date, there has been one needs assessment which appraised both the clinical and non-clinical domains of continuing professional development (CPD) for EM faculty, and none in the United States (US).

Objectives: The primary goal of this study is to assess the perceived needs and desirability of various CPD activities for EM faculty within both the clinical and non-clinical spheres of EM.

Methods: This was a prospective, exploratory study using survey methodology. A previously validated survey with minor modifications was distributed anonymously online to 67 EM faculty members at a university tertiary referral center. Participants were questioned about the desirability of CPD in the following areas: procedures, clinical emergency topics, diagnostics, management, teaching, and research skills. The survey incorporated a mixed-methods design with both Likert-scale response options as well as some qualitative, open-ended questions. The survey was available for completion from 11th December 2019 – 15th January 2020.

Results: The survey was completed by 47 faculty members (70% response rate). Of the procedural skills, more than 90% of respondents desired CPD in ventilator use, advanced airways, and regional anesthesia. Of the clinical EM topics, greater than 90% of attendings were interested in toxicological emergencies and cardiac emergencies. Of the diagnostic skills, more than 85% of respondents desired to learn more about CT interpretation. Of the listed management skills, more than 80% of faculty members desired more CPD in giving feedback and appearing in court. In the domain of teaching and

research skills, more than 85% desired CPD on teaching for simulation instruction.

Conclusions: This is the first study in the US to assess the needs of both the clinical and non-clinical domains of CPD for EM faculty. The identified preferential topics from the needs assessment will be utilized to develop a targeted CPD curriculum for EM faculty.

17 Defining the Clinical and Procedural Opportunities Available to Residents During Rural Rotations

Brandon Haefke, MD; James Homme, MD; Daniel Scholz, MD; Catherine Yang; Derick Jones, MD

Learning Objectives: The purpose of this research study was to objectively measure the clinical experiences that residents are exposed to during rural rotations, in order to more accurately assess their educational value.

Background: Many emergency medicine (EM) residency programs include clinical rotations in rural emergency departments ("rural rotations") as part of their curriculum. These rotations are designed to expose residents to clinical scenarios which are less frequently encountered in tertiary centers. Additionally, they teach residents how to manage "routine" clinical scenarios in lower-resource settings, often without consulting services and less learner pressure. To date, these proposed benefits have not been empirically studied.

Objective: The aim of this study is to determine the rate at which residents were exposed to key clinical or procedural experiences ("CPEs") while on rural rotations.

Methods: We conducted a retrospective chart review of all patient encounters involving EM residents at two rural hospitals in the upper Midwest from 7/1/2019 to 6/30/2020. An expert panel predetermined a list of 21 CPEs to be assessed. A total of 1377 encounters were reviewed. The frequency of each CPE was calculated and expressed as the number of CPEs expected for each 12-hour shift along with 95% confidence intervals.

Results: Of the 1377 patient encounters over a total of 1770 resident clinical hours, the most frequently encountered CPEs were: Ambulance Necessity Documentation (1.12 experiences per shift), Critical Care 0.6 per shift), Laceration Repair (0.4 per shift) and Splint/Cast Application (0.18 per shift).

Conclusion: Rural EM rotations provide residents exposure to a variety of valuable educational experiences, and for many, after just a few shifts. Future research will compare this data to a tertiary care center to determine whether rural rotations grant superior exposure to any CPEs. Additionally, we plan to expand this study to investigate other proposed benefits of these rotations, including independent decision making and resource allocation.

Table 1.

CPE	Experiences/Shift	95% CI
Ambulance Necessity	1.12	0.96-1.28
Critical Care	0.60	0.48-0.72
Laceration Repair	0.41	0.31-0.51
Splint/Cast Application	0.18	0.11-0.25
Trauma Activation	0.14	0.06-0.20
Psych Evaluation	0.10	0.05-0.15
Stroke Diagnosis	0.08	0.04-0.13
Incision & Drainage	0.08	0.04-0.13
Fracture Reduction	0.05	0.01-0.08
Procedural Sedation	0.05	0.01-0.08
Intubation	0.03	0-0.05
STEMI Diagnosis	0.02	0-0.04
Arthrocentesis	0.02	0-0.04
Cardiac Arrest Diagnosis	0.01	0-0.03
Complex Lac. Repair	0.01	0-0.03
Nailbed Repair	0.01	0-0.03
Lumbar Puncture	0.01	0-0.02
Vaginal Delivery	0	
Rule Out Labor	0	
Chest Tube	0	
Lateral Canthotomy	0	

18 Development of a Resident Lead Critical Care Equipment Checklist and Consistency of Equipment Readiness

Jared Ditkowsky, MD; Samia Cabezas, BS; Jose Miguel Juarez, MD; Arjun Prabhu, MD, MBE; Erick Eiting, MD MPH; Caroline Burmon, MD

Learning Objectives: This study investigates if the initiation of a resident lead interdisciplinary equipment checklist improves acute critical care equipment readiness in the Emergency Department. Furthermore, this study seeks to identify what barriers exist to consistent survey completion.

Background: Interdisciplinary efforts ensuring clinical readiness in Emergency Departments (ED) can lead to improved patient care. Studies report that equipment checklists can improve procedural and patient outcomes.

Objectives: To evaluate the impact of an resident-led equipment checklist on ED critical care readiness, and to identify barriers to survey completion.

Methods: A multidisciplinary team of ED/critical care attendings, residents and nursing staff developed an acute care equipment checklist via REDCap©. One week of control data was collected by investigators prior

to implementation. Survey availability was advertised to all residents at a three-site urban academic Emergency Medicine program and was implemented at one site. A postgraduate year 2 or 3 resident was asked to lead survey completion with members of ED staff each morning and evening shift. Once complete, an automated email initiated a restocking mechanism. Data was collected over 12 weeks, encompassing 3 academic blocks (each with new resident staffing), and analyzed retrospectively.

Results: The Control Block and Block 1 display similar equipment readiness, with a large number of items "Not Checked" in Block 1. Block 2 showed a marked improvement in percentage of equipment ready, which was maintained in Block 3. There was a ~21.47% response rate for surveys. Completion during night shifts was lower compared to days. Postgraduate year status did not play a major role in completion rates. Staff transitions did not result in consistent response trends.

Conclusions: Implementation of a resident-led critical care supply checklist completed by an interdisciplinary team improved equipment readiness across postgraduate years and staffing/block transitions. Working a night shift was identified as a barrier to completion, while postgraduate year was not. Identification of other survey completion barriers and survey impact on resident equipment familiarity requires further investigation.

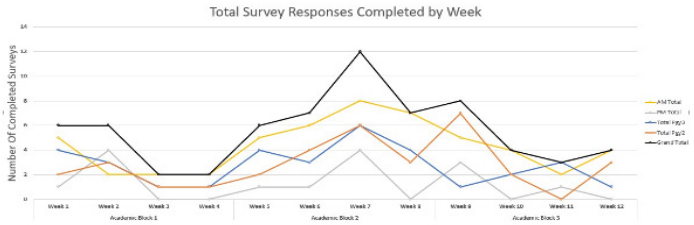

Figure 1. Total survey responses complete by week: displays total number of critical care equipment check surveys completed by residents by each week. Curves are broken down by post graduate year 2/3 and AM vs PM shifts.

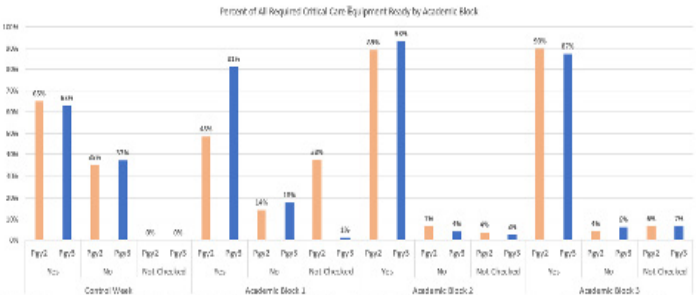

Figure 2. Percent of all required critical care equipment ready by academic block: displays the percent response of "Yes", "No", or "Not Checked" (survey default response) by academic block when responses are averaged across all survey items.

19 Do 4th Year Medical Students Applying to Emergency Medicine Match Where They Rotate?

Diana Labrada; Wesley Barnett, MD; Sameer Desai, MD

Learning Objectives: To identify if 4th year medical students applying to emergency medicine are more likely to match at a program where they rotated to identify factors influencing an applicant's program rank list order

Background: An impactful portion of applying to an emergency medicine (EM) residency is participating in away rotations to obtain Standard Letters of Evaluations (SLOEs) to gain residency interviews to participate in the NRMP Match.

Objectives: To identify if fourth year medical students going into EM are more likely to match where they rotated. Since away rotations allow applicants to evaluate a program in person, we hypothesize most students match at a program where they rotated.

Methods: This is a retrospective observational survey. The survey was sent to EM residents in ACGME approved programs via the Council of Program Directors listserv sent by the EM Program Director of the University of Kentucky. Two hundred and thirty-nine responses from 12/06/2019-02/10/2020 were received. Inclusion criteria included being a current EM resident at an ACGME approved program. Exclusion criteria included an incomplete survey or not completing away rotations.

Results: Of 235 applicants, 106 applicants did 3 months of Emergency Medicine during their 4th year curriculum. Out of 226 applicants who ranked their away rotations, 73% ranked one of their away rotations in their top 3. Notably, 9/235 of applicants who rotated did not rank their away rotation, while 136/235 agreed that lack of a rotation at an institution would have affected their decision to rank a program. The top two factors affecting a programs' rank included fit (n=99) followed by location (n=80). Finally, 121 (51.5%) students matched to a place they rotated.

Conclusions: Although 51.5% of students ultimately matched to a program they rotated, 48.5% did not. Fit and location continue to be the leading factors affecting rank list order. Limitations to this study were inability to separate students who did not initially match upon graduating medical school, inability to account for students who did not have a home program, and including a home rotation as an away rotation.

20 Does QBank Participation Impact In-training Exam Performance?

Lauren Walter; Maxwell Thompson, MD; Matthew Delaney, MD; Charles Khoury, MD

Learning Objectives: To assess the impact of QBank participation and performance as it correlates with EM resident ITE performance.

Background: Performance on the American Board of Emergency Medicine (ABEM) annual In-training Examination (ITE) for Emergency Medicine (EM) residents has been shown to correlate with subsequent performance on the ABEM qualifying exam. As such, significant planning is often committed to ITE preparation, both from an individual resident and a residency program perspective. Online question banks (QBanks) represent a popular media for ITE preparation however, the specific impact of QBanks on ITE performance is unclear.

Methods: ITE and QBank performance results were collated over two academic years, 2018-19 and 2019-20, from a three-year EM residency program. ITE raw scores and percentile rank for training level scores were compared with performance on a QBank provided for independent resident study, including QBank average performance score as well as number of QBank questions completed. The Pearson correlation coefficient was used to measure the strength of a linear association between ITE performance and QBank correlates.

Results: Sixty-two sets (30 residents in 2018-19, 32 residents in 2019-20) of ITE performance data and QBank correlates were included. The mean number of QBank questions completed was 1155 with a standard deviation of 768. Raw ITE scores and number of QBank questions completed were found to have a significant, positive correlation, $r(60) = .34$ ($p < .05$). Likewise, ITE percentile rank for training level scores were also found to have a significant, positive correlation with number of QBank questions completed, $r(60) = .35$ ($p < .05$) (Figure 1). ITE percentile rank for training level correlated positively with QBank average performance, albeit weakly, and was not found to be significant ($p = .16$).

Conclusion: Participation in a QBank, quantified specifically by number of QBank questions completed, is associated with improved resident performance on the ITE. Incorporation of QBank self-study may be an effective mode of ITE preparation.

21 Educational Model for Corneal Foreign Body Removal in Emergency Medicine Residency

Gregory Black, MD; Alex Tymkowicz, MD; Danielle DiCesare, MD; Jillian Davison, MD

Learning Objectives: The objective of this study is to evaluate the efficacy of a low fidelity educational model used for teaching corneal foreign body removal to EM students and residents by using a survey to assess the comfort levels of participants before and after a corneal foreign body skills lab.

Background: Corneal foreign body (CFB) removal is a difficult and highly skilled intervention required of EM physicians. When CFBs are not properly removed, patients are at risk for complications including infection, ulceration, and vision loss. Only 0.19% of ED visits are related to ocular foreign bodies, thus this important skill can be missed during EM training.

Objectives: To evaluate the efficacy of an educational model used for teaching CFB removal by using a survey to assess the comfort levels of participants before and after a CFB removal skill lab.

Methods: This was a prospective study on an educational model for teaching CFB removal using a survey to assess pre- and post-skill lab comfort with CFB removal by medical students and PGY1-3 EM residents. The study included one 2-hour skill session at an ACGME-accredited EM residency at a Level 1 Trauma Center. The study evaluated the comfort levels based on year of education and whether or not participants had previous experience removing CFBs. Participants ranked their overall comfort of removing CFBs on a scale of 1 to 10 before and after the skills lab. Analysis was completed using Wilcoxon signed-rank test on SPSS.

All participants (N=22) showed an increase in comfort level with CFB removal from 3.81 to 7.09 ($p < 0.00001$). Those with no experience in CFB removal gained a statistically greater benefit than those with experience (p 0.0003 vs. 0.068). Medical students showed an increase in comfort levels from 1.6 to 4.6, which was not statistically significant (p 0.066). PGY1 increased from 3.22 to 5.55 (p 0.027), PGY2 increased from 2.14 to 6.4 (p 0.042), and PGY3 increased from 4.57 to 7.28 (p 0.02).

This educational model for CFB removal showed benefit across all levels of medical education. The greatest improvement in comfort levels was seen in those who had less experience in CFB removal and resident physicians. This suggests utility for CFB removal skill labs earlier in EM residency training.

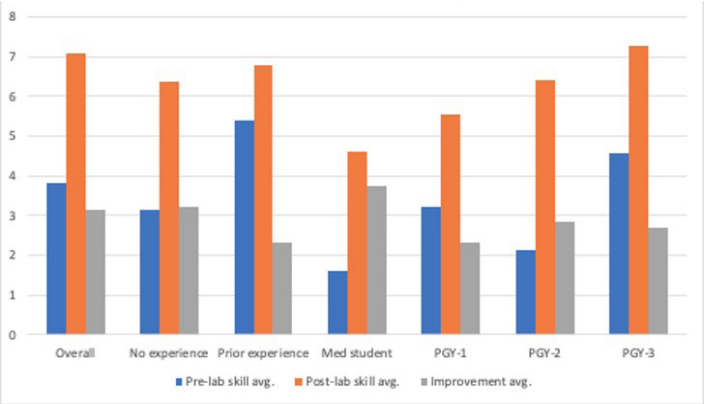

Figure 1. Pre- versus post-lab skill ratings.

	Participants (N)	Pre-lab skill avg.	Post-lab skill avg.	Improvement avg.	Wilcoxon p-value	Wilcoxon Z-value
Overall	22	3.81	7.09	3.13	<.00001	-4.0145
No experience	17	3.16	6.38	3.22	0.0003	-3.6214
Prior experience	5	5.4	6.8	2.33	0.068	-1.826
Med student	4	1.6	4.6	3.75	0.066	-1.841
PGY-1	7	3.22	5.55	2.33	0.027	-2.214
PGY-2	5	2.14	6.4	2.83	0.042	-2.032

Figure 1.

22 Educational Value of Patient Follow-ups and a Patient Follow-up Curriculum

Andrew Grock, MD; Stephen Villa, MD; Natasha Wheaton, MD; Jaime Jordan, MD, MAEd; Kellie Kitamura, MD; Steven Lai, MD; Pamela L. Dyne, MD; Rebecca Bavolek, MD

Learning Objectives: - Understand that no standard curriculum exists to satisfy the ACGME and RRC requirement for patient across US EM residency programs.

- Residents greatly value patient follow-ups.

- Residents rated a curriculum involving logging patient name and outcome less valuable overall.

Background: The Accreditation Council for Graduate Medical Education (ACGME) and Residency Review Committee (RRC) require Emergency Medicine (EM) residents to perform patient follow-ups as a component of the core competency, Practice Based Learning and Improvement. While programs satisfy this requirement differently, limited data exists for specific follow-up curricula or best practices.

Objectives: To perform an evaluation of the patient follow-up curricula at our institution.

Methods: EM residents completed an online, mixed methods survey consisting of both likert scaled and free response items. We used descriptive statistics for items with discrete answer choices. Two independent analysts performed a qualitative thematic analysis of the free response data. Discrepancies were resolved through in-depth discussion and negotiated consensus.

Results: 42/60 (72.4%) residents completed the survey. Residents rated the educational importance of follow-ups highly (66.6% extremely or very important) and valued the current curriculum less highly (19.1% extremely or very important). (Table 1) The thematic analysis revealed the following major themes across the educational benefit of follow-ups, strengths of the current curriculum, and suggestions for improvement of the current curriculum as described more fully in Table 2. Residents reported the educational value from patient follow-ups stems from reviewing inpatient medical management, reviewing patient outcomes, error notification, and confirming appropriate management. All relate to the goal of improving medical management in the ED. The current system's strengths were described as: easy to use, encourages follow-ups, ACGME compliance, and no strengths exist. To improve the current curriculum, participants recommend decreasing the administrative burden, incorporation of the electronic health record, and automatic notifications for bouncebacks, unexpected patient outcomes, and medical errors (Table 2).

Table 1. Follow-up importance versus value of current curriculum.

	Extremely	Very	Moderately	Slightly	Minimally	Not at all	Total
How important is follow-up on patients to your learning?	9 (21.4%)	19 (45.2%)	11 (26.2%)	2 (4.8%)	0 (0.0%)	1 (2.4%)	42 (100%)
How would you rate the value of the current follow-up system to your education?	2 (4.8%)	6 (14.3%)	9 (21.4%)	11 (26.2%)	7 (16.7%)	7 (16.7%)	42 (100%)

Table 2. Major themes form qualitative analysis.

Question	Major Themes	Exemplar Quotes
1. Do you think there is a benefit to patient follow-ups? Why or why not?	Improved Medical Management From Poor Outcomes	- To learn about what could be improved and what happened to the patient. What I might have overlooked. - Learning what you did right and wrong and learning how you can do things even better by anticipating what will happen during the patient's admission or seeing why they bounced back
	Reviewing Outcome	- What we do is for good outcomes. Without knowing outcomes how do you know what you are doing is good?
	Confirm Management Appropriate	- I think they've vital to knowing whether our ED management was appropriate - The confirmation of a diagnosis or outcome of a procedure have always been pretty helpful.
	Reviewing Inpatient Next Steps	- Allows you to learn what next steps of management are for your patients
2. What do you think the strengths of the current follow-up system is?	ACGME Compliance	- Good to have something in place to hold us accountable
	Ease of Use	- Easy to do
	No Strengths / Benefits Exist	- Absolutely none. It's just a bureaucratic work requirement.
3. How would you improve the follow-up system to make it more meaningful to you?	Decreasing the Administrative Burden	- Logging patient follow ups is time-consuming - Reduce the documentation requirements - Automate the patient logging process. Most (if not all) of us follow up on our patients because we're interested and want to know how our patients do. Most of us don't log these follow ups because the Medhub logging process is so difficult and time consuming.
	Automatic Notification of Bounce-backs, Medical Errors, and Unexpected Outcomes	- Have an automatic way of notifying us about "bouncebacks", change in dispo after signout, upgrade in care level / significant events 24 hours after admission - Have cases with poor outcomes automatically be bounced back to you - Emails when my patients have serious complications or deaths - We should receive automatic emails if a patient we admitted becomes deceased. we should receive an automatic email if a patient we discharged bounces back. - Have it be automatic; I want an email when there is a bounce back or a bad outcome from a procedure, etc
	Incorporation of the Electronic Health Record	- I would create a way to flag a chart/patient in the ED so that it creates a queue of patients that I can follow up on later. - I would like the EMR to flag patients who return to the ER within a week, 2 weeks, or even a month after I discharge them - Have a tab or folder automatically updated with list of patients who are admitted

23 Effectiveness and Utilization of Hospital-Directed Wellness Initiatives during the COVID-19 Pandemic

Adrian Cotarelo; Nishad Rahman, MD; Adrian Cotarelo, MD, MHS; Mary McLean, MD; Miriam Kulkarni, MD

Learning Objectives: Given the ongoing pandemic, the authors hope to determine which of the commonly implemented COVID-19 hospital-directed wellness initiatives were most effective for physicians, enabling tailored recommendations for future wellness plans.

Background: The COVID-19 pandemic has placed an unprecedented burden on healthcare workers. Many hospitals have instituted wellness initiatives. The optimal hospital-directed wellness initiatives during a pandemic are currently unknown.

Objectives: The authors hope to determine which of the commonly implemented COVID-19 hospital-directed wellness initiatives were most effective for physicians, enabling tailored recommendations for future wellness plans. The hypothesis is that some hospital-directed wellness initiatives are significantly more effective than others.

Methods: This cross-sectional survey was distributed via EM specific online email listservs and message boards, including ACEP, CORD, and SAEM/RAMS. Emergency Medicine physicians practicing in the USA were recruited; sample size was determined via convenience sample. Survey questions included practice setting, geographic location within the US, and pandemic-specific wellness initiatives implemented at institutions. Likert scale (1-5) responses were assessed for self reported effectiveness of each of the specified hospital wellness initiatives. Results were analyzed using descriptive statistics.

Results: There were 527 responses eligible for inclusion. Morale at the time of the survey was significantly worse than morale at peak (4.36 v 4.57, p = 0.02). The most effective interventions were direct payment, informal debriefing sessions among staff, free food and community Thank You cards. The least effective was the use of a victory song. The most common intervention was free food. The least common was direct payment. Among effective interventions, only free food was offered a majority of the time.

Conclusions: Hospital-directed wellness plans should focus resources on more effective interventions such as direct payments, free food, informal debriefing sessions, and community Thank You cards. Wellness plans should continue even after COVID-19 cases lessen.

		Effectiveness (1-5)	
Intervention	**Frequency (%)**	**Median**	**Mean (SD)**
Direct Payment/Hazard Pay	53 (10.06%)	4	3.605 (1.120)
Informal debriefing sessions among staff	127 (24.10%)	4	3.507 (1.153)
Free food at work, including from the community	350 (66.41%)	3	3.344 (1.140)
Display of Thank You cards from the community	254 (48.20%)	3	3.215 (1.106)
Public acknowledgement/displays (daily applause for hospital staff, military jets overhead, EMS/Fire Department/Police display of lights and sirens, etc)	231 (43.83%)	3	2.952 (1.245)
Daily email updates from hospital administration or whoever else might send them	266 (50.47%)	3	2.891 (1.250)
Displaying support signs	301 (57.12%)	3	2.867 (1.138)
Public celebration of successful COVID-19 discharges	92 (17.46%)	3	2.859 (1.228)
Psychiatric/Psychological services	189 (35.86%)	3	2.549 (1.127)
Victory Song playing overhead	100 (18.98%)	2	2.086 (1.123)
No support	24 (4.55%)	N/A	N/A

Figure.

24 Effectiveness of low fidelity in situ simulation for medical resuscitation team leadership development among emergency medicine residents

Alexander Finch; Kristina Colbenson, MD; Samuel Garcia, MD; Bergthor Jonsson, MD; Jenna Geers, MB BCh BAO; James Homme, MD; James Colletti, MD

Learning Objectives: Our objective was to assess the effectiveness of an ultra-low fidelity simulation model to improve PGY-1 resident resuscitation competence and confidence. A secondary objective was to assess content retention over time.

Background: Our emergency medicine (EM) residency program evaluation committee identified the transition of EM interns to the post-graduate year PGY-2 and PGY-3 medical resuscitation team leader role as a program gap. Key areas for development included cognitive component mastery and confidence.

Methods: The study was implemented one hour per month during scheduled conference time. All 26 EM residents were encouraged to participate. Three one-hour simulations were performed from August to November 2020. Pre- and postintervention cognitive and confidence outcomes were measured. Topics from previous simulations were implemented into all simulations as a spaced repetition component. We report descriptive statistics.

Results: Twenty-two resident assessments and surveys were recorded over 3 months. The mean PGY-1 resident cognitive component assessment score increased from 26% pre-intervention to 64% post-intervention while the mean PGY-2 and PGY-3 resident score increased from 44% preintervention to 83% postintervention for all 3 simulations combined. Data from the first simulation was tracked for content retention over three months. The mean PGY-1 resident score was 86% on review assessment and the mean PGY-2 and PGY-3 resident score was 71% at the three-month time point. 100% of residents reported that they perceived improved cognitive ability and confidence in leading medical resuscitations following the intervention and believed it was an appropriate use of conference time.

Conclusions: A spaced repetition, ultra-low fidelity in situ simulation improved EM resident competence and confidence in the medical resuscitation team lead role. Our results suggest that the model contributed to high content retention over time.

25 Emergency Medicine and Internal Medicine: Perceptions of the Relationship and Professionalism

Navdeep Sekhon, MD; Anisha Turner, MD; Adedoyin Adesina, MD; R. Michelle Schmidt, MD; Erica Lescinskas, MD; Malford Pillow, MD, MEd; Sarah Bezek, MD

Learning Objectives: To assess the current state of the relationship and professionalism between Emergency Medicine and Internal Medicine Physicians at a county, academic hospital.

Background: Collaboration between Emergency Medicine (EM) and Internal Medicine (IM) providers is essential in assuring safe patient care transitions from the emergency department (ED) to inpatient services, but can be prone to conflict.

Objectives: We used a cross-sectional survey to investigate the perceptions of EM and IM residents and faculty regarding their attitudes in regards to collaboration, respect, and mistreatment in interdepartmental interactions.

Methods: This cross-sectional survey was administered to the EM and IM faculty and residents of a county, academic hospital. This study was a performance improvement project to evaluate each specialty's current perception of professional behaviors by the other specialty in order to identify areas for improvement via a survey. The survey items were answered using a 5-point Likert scale. P-values were calculated using the unpaired t-test.

Results: 68 residents and faculty completed the survey, 32 (59.4% residents) from EM and 36 (94.4% residents) from IM. 11.8% of all respondents reported experiencing unprofessional behaviors from the other department at least once a month. EM most frequently reported the following unprofessional behaviors: condescension (82.1%), dismissiveness (60.7%) and rudeness (50.0%); while IM reported dismissiveness (50.0%) and unwillingness to help (38.5%) as being common. EM clinicians, compared to IM clinicians, reported experiencing condescension (p-value<0.0001) and rudeness (p-value= 0.0041) more frequently. Challenges identified by EM physicians included time to consult, recommendations, and disposition. Challenges identified by IM included difficulty contacting EM physicians and lack of communication regarding patient's clinical status changes.

Conclusion: This study is a first look at the prevalence of negative attitudes and misperceptions between EM and IM providers. Further studies can be done to determine how these attitudes and misperceptions can be lessened.

Table 1. Unprofessional behaviors that disturbed respondents.

	Emergency Medicine	Internal Medicine
They were dismissive	17 (60.71%)	13 (50%)
They were not appreciative	9 (32.14%)	7 (26.92%)
They were overly confrontational	10 (35.71%)	6 (23.07%)
They were just plain rude	14 (50%)	5 (19.23%)
They were unwilling to help	6 (21.43%)	10 (38.46%)
They were condescending	23 (82.14%)	7 (26.92%)

Table 2. Situations that present challenges to professional and collegial interactions between services (1=Never, 2=Rarely, 3=Occasionally, 4=Frequently)

Situation	Emergency Medicine		Internal Medicine	
	Average Score	n	Average Score	n
Requests for routine consultation	1.87	23	2.07	27
Requests for disposition	2.66	29	2.74	31
Uncertainty over responsibility of completing procedures	2.13	29	2.42	31
Communications of changes of patient status	2.29	31	2.88	32
Expectations for turnaround time for consults	2.82	28	2.45	29
Ease of contacting the other service	2.19	27	2.52	33
Uncertainty over guidelines	2.04	28	1.90	29

26 Emergency Medicine Clerkship Director Experience Adopting Emergency Remote Learning During the Onset of COVID-19 Pandemic

Xiao Chi Zhang, MD, MS; Ronnie Ren, MD; Kendra Parekh, MD; Doug Franzen, MD, MEd, FACEP; Molly Estes, MD; Melanie Camejo, MD; Mark Olaf, DO, FACEP

Learning Objectives: To survey EM clerkship directors (CDs) on their experience adapting an EM virtual rotation (VR) curriculum during the onset of the COVID-19 pandemic.

Background: The recent outbreak of the coronavirus disease 2019 (COVID-19) altered the traditional paradigm of clinical medical education by necessitating distance learning, employing new educational platforms such as video conferencing and virtual simulation in order to reduce disease transmission, and to minimize the loss of student learning in lieu of reduced clinical exposure. While individual clerkships have shared their curricular adaptations via social and academic networking media, there is currently no organizational standard in establishing a non-clinical, EM virtual rotation (VR).

Methods: A 21-item survey with quantitative and qualitative questions was disseminated between June and August 2020 to EM clerkship directors (CDs) via CDEM Listserv to describe their experience and perspectives in adopting a virtual EM rotation during the spring of 2020.

Results: 59 out of 77 EM clerkship survey responses were analyzed. 52.5% adopted a VR while 47.5% did not. Of those who adopted a VR, 71% of CDs had 2 weeks or less with 84% reporting usual or increased clinical load while

creating a new curriculum. Clerkships significantly diversified their asynchronous educational content and utilized several instructional models to substitute the loss of clinical experience. 71% of CDs did not feel comfortable writing a standardized letter of evaluation for students during the VR, with the majority citing inability to evaluate students' competencies in a clinical context. See Table 1 and Figure 1 for details.

Table 1. Clerkship Experience Adopting EM Virtual Rotation (N=31)

Time Available to Develop Virtual Rotation (VR)	% Respondents	n
Less than 1 week	32.26%	10
1-2 weeks	38.71%	12
2-4 weeks	22.58%	7
More than 4 weeks	3.23%	1
Time Spent Developing VR	**% Respondents**	**n**
Less than 12 hours	12.90%	4
12-24 hours	38.71%	12
24-72 hours	32.26%	10
72 hours or more	12.90%	4
Clinical Load during VR Development	**% Respondents**	**n**
Reduced clinical load	12.90%	4
Usual clinical load	67.74%	21
Increased clinical load	16.13%	5
Grading Scheme Utilized	**% Respondents**	**n**
Ordinal (i.e. A, B, C, D)	12.90%	4
Pass/Fail	74.19%	23
Faculty Interaction with Students Outside Clinical Shifts	**% Respondents**	**n**
Increased	41.94%	13
No change	6.45%	2
Decreased	38.71%	12
I am able to get to know the student as an individual better in a VR	**% Respondents**	**n**
Strongly Disagree	41.94%	13
Somewhat Disagree	22.58%	7
Neither Agree or Disagree	6.45%	2
Somewhat Agree	16.13%	5
Strongly Agree	0.00%	0
I am able to evaluate the student's clinical competencies better as specified by the Standardized Letter of Evaluation (SLOE) in a VR	**% Respondents**	**n**
Strongly Disagree	58.06%	18
Somewhat Disagree	19.35%	6
Neither Agree or Disagree	3.23%	1

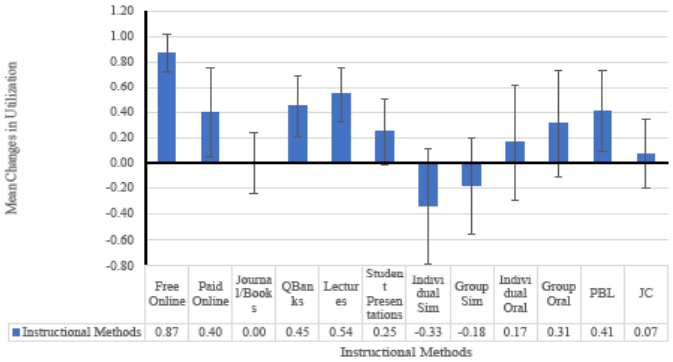

Figure 1. Mean Changes in Utilization of Instructional methods from In-Person Rotation to Virtual Rotation on a 3-point scale (-1 = decreased, 0 = did not change, +1 = increased). Brackets represent margin of error based on a 95% confidence interval. Qbank = question banks; PBL = problem-based learning; JC = journal clubs.

Conclusion: A crisis, such as COVID-19 necessitates change in all facets of medical education. While EM educators demonstrated the ability to create emergency remote learning with limited time, this was not equivalent to formal development of pre-planned virtual rotation experiences. Future faculty development and curriculum innovation are required to fully transition an in-person immersive experience to a non-inferior virtual experience.

27 Emergency Medicine Radiology Education: A National Needs Assessment

Stephen Villa; Natasha Wheaton, MD; Steven Lai, MD; Jaime Jordan, MD, MAEd

Learning Objectives: Our objective was to explore the current state of radiology education in Emergency Medicine (EM) residency programs.

Background: Radiology training is an important component of medical education, but its delivery has been variable. Program directors have reported a lack of radiology skills in incoming interns. A needs assessment is a crucial first step to improving radiology education.

Methods: This was a cross sectional survey study of all ACGME-accredited EM programs in the U.S. Program leadership completed an online survey consisting of 16 items: 7 Likert, 8 Multiple choice, 1 free response item. Descriptive statistics were calculated and reported.

Results: 142/252 (56%) of eligible EM programs completed the survey. Program Demographics are shown in Table 1.

88/142 (62%) of EM programs did not have formal instruction in radiology. Of the instruction that is provided, 127/142 (89.44%) provide instruction via didactics/lectures and 115/142 (81%) rely on instruction during clinical shifts. Only 51/142 (36%) provide asynchronous opportunities and 23/142 (16%) have a dedicated radiology rotation.

134/142 (95%) of leadership felt that it was extremely or very important for ED providers to be able to independently interpret their x-ray results. 129/142 (91%) either sometimes or always relied on their independent x-ray interpretations

Table 1. Program demographics.

Program Format	N* (% of total)
PGY 1-3	105 (74.47%)
PGY 1-4	36 (25.53%)
Primary Clinical Site	
County	21 (14.89%)
University	58 (41.13%)
Community	54 (38.30%)
Other	8 (5.67%)
Program Region	
Western Region (AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY)	23 (16.31%)
North Central Region (IA, IL, IN, MI, MN, ND, NE, OH, SD, WI)	29 (20.57%)
South Central Region (AR, KS, LA, MO, OK, TX)	14 (9.93%)
South East Region (AL, FL, GA, KY, MS, NC, PR, SC, TN, VA, VI, WV)	28 (19.86%)
North East Region (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT)	47 (33.33%)

*1 respondent opted out of the demographic portion of the survey leaving a total of 141 responses available for analysis

to make clinical decisions. The most important radiology studies to be able to independently interpret were x-rays obtained for lines/tubes, chest x-rays and x-rays obtained for musculoskeletal related complaints.

Conclusions: A minority of EM residency programs have formal training in radiology despite the majority of program leadership believing that these are important skills. The most important curricular areas were identified. These results may inform the development of formal radiology curricula.

Table 2. Residents should be able to independently interpret the following radiologic studies at graduation (1=strongly disagree, 5=strongly agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Weighted Average
X-ray for central line or ET tube, NG/G tube placement	1.41%	0.00%	0.00%	3.52%	95.07%	4.91
Chest x-ray	1.42%	0.00%	0.71%	3.55%	94.33%	4.89
MSK x-ray (i.e. shoulder, elbow, wrist, hand, knee, ankle, foot, etc.)	1.41%	0.00%	2.11%	16.20%	80.28%	4.74
Pelvis x-ray	1.43%	0.00%	4.29%	14.29%	80.00%	4.71
Soft tissue neck x-ray (i.e. pediatric stridor)	1.41%	1.41%	11.27%	29.58%	56.34%	4.38
CT brain (non-contrast)	0.70%	3.52%	7.04%	38.03%	50.70%	4.35
Abdominal x-ray	1.42%	0.71%	15.60%	33.33%	48.94%	4.28
CT cervical spine	1.42%	12.06%	30.50%	36.88%	19.15%	3.6
CT abdomen/pelvis	2.11%	13.38%	29.58%	43.66%	11.27%	3.49
CT angiography chest (i.e. PE)	3.52%	16.20%	33.80%	36.62%	9.86%	3.33
CT chest	4.93%	14.79%	39.44%	35.21%	5.63%	3.22
CT extremity	10.56%	31.69%	38.73%	14.08%	4.93%	2.71
CT/CT angiography (i.e. stroke protocol)	10.56%	31.69%	36.62%	19.01%	2.11%	2.7
MRI brain	28.17%	34.51%	25.35%	11.27%	0.70%	2.22
MRI spine	30.28%	35.21%	23.24%	10.56%	0.70%	2.16

28 Emergency Medicine Resident Perceptions of the Didactic Experience During the Covid-19 Pandemic

Therese Mead; Ian Keck, DO; Vina Tran, MD; Kaitlin Rose, BS

Learning Objectives: The learning objective of this study was to evaluate the impact of the Covid-19 pandemic on the didactic experience of EM residents in the United States.

Background: Due to the onset of Covid-19, many residency programs shifted from in-person education to online learning utilizing web-based platforms. Limited data exist on resident physicians' perceptions of the educational environment during this time.

Objective: The objective of this study was to evaluate how the Covid-19 pandemic affected the didactic experience of EM residents in the United States. We hypothesized that resident physicians preferred a hybrid model of online and in-person learning.

Methods: This observational study (completed in November 2020) assessed EM resident perceptions of the didactic learning environment during the Covid-19 pandemic utilizing an online survey. Participants were invited through the CORD listserv. Subjects included were EM residents and fellows in the US. There were 14 survey questions including demographics and perceptions of aspects of the didactic environment in 2020. Quantitative statistical analysis of question responses was performed.

Results: 78 participants from 12 states completed the survey. 98.7% of subjects reported that some or all their in-person meetings were temporarily stopped during the Covid-19 pandemic. 98.7% of residents reported that their residencies utilized web-based meeting platforms. 77% of respondents indicated that their didactics were still being held virtually. 46% of subjects reported that live lectures provided a better learning experience than online. 15% of respondents kept their webcam on during the entire online learning experience. When envisioning July 2021, 71% of respondents answered that they would like to see their programs utilize a hybrid model of in-person and online learning.

Conclusions: Most programs temporarily stopped all or some of their in-person meetings and utilized a web-based meeting platform. Many residents preferred a hybrid model of learning. Limitations included sample size. This study provided valuable data on trends in EM education during the pandemic.

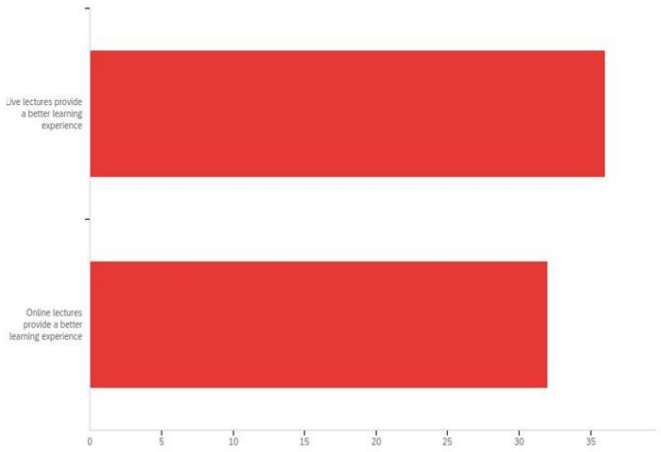

Figure 1. Comparison of online lectures and live, in-person lectures.

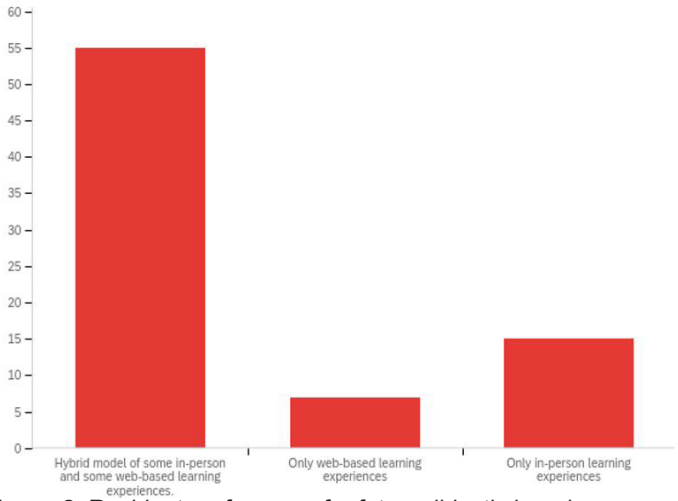

Figure 2. Resident preferences for future didactic learning experience.

29 Emergency Medicine Virtual Conference Participants' Engagement with ep and Competing Activities

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Learning Objectives: To characterize the competitive demands for learner attention during virtual didactics and pilot a methodology for future studies.

Background: Residency didactic conferences have transitioned to a virtual format due to the COVID-19 pandemic. This format creates new questions about learning outcomes, the success of which relies on learner engagement.

Objectives: To characterize the competitive demands for learner attention during virtual didactics and pilot methodology for future studies.

Methods: We conducted a prospective cohort study of attendees at virtual didactics from a single four-year EM training program. We designed an activity survey utilizing a self-report strategy informed by validated classroom assessments of student engagement. This two-question survey was deployed using ZoomTM polling across six conference days using random signaled sampling. Participants identified their learner role and reported all activities during the preceding 5-minutes.

Results: We had 1,303 responses over 40 survey deployments. Responses came from Residents (63.4%), Faculty (27.5%), Fellows (2.3%), Students (2%) or Others (4.8%).

About 85.3% of attendees reported engaging in the virtual conference within the last five minutes. A total of 902 out of 1,303 (69.2%) respondents reported engaging in multiple activities, including: related-educational (34.2%), work-related (21.1%), social (18.8%), entertainment (4.4%), personal (14.6%), and self care (13.4%). There was a decline in reported engagement in conference and education-related activities as the conference block progressed.

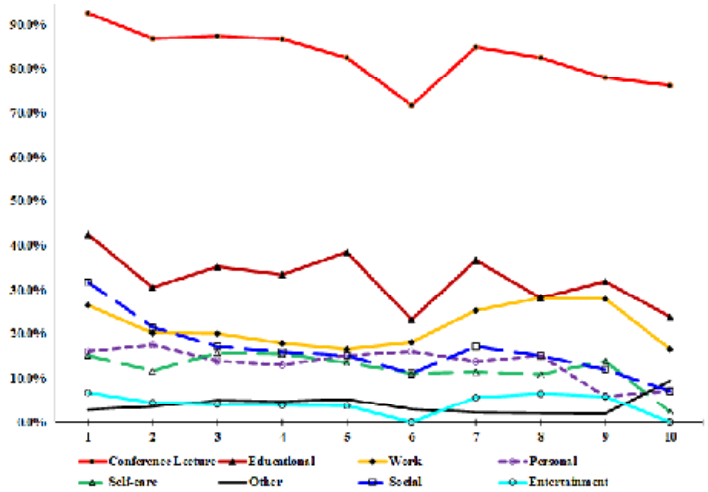


Figure 1. Activities Engaged in During the Last 5 Minutes, across All Polls and All Days. X-axis denotes the number poll deployed (1st polls of all days, 2nd polls of all days, etc). Y-axis denotes the percentage of respondents reporting each activity.

Conclusions: Learners engage in a variety of other activities during virtual didactics. Engagement appears to fluctuate and trend temporally which may inform teaching strategies. This information may also provide unique instructor feedback. This pilot study demonstrates methodology for future studies of conference engagement and learning outcomes.

30 Evaluating the Core Emergency Medicine Entrustable Professional Activities using the EQual Rubric

Andrew Golden

Learning Objectives: The purpose of this investigation is to further study the interrater reliability of the EQual rubric. Additionally, it will examine the alignment of EPAs for EM residency training to published standards as defined by performance on the EQual rubric.

Background: Entrustable professional activities (EPAs) are being more frequently utilized in medical education workplace-based assessments (WBAs). Core EPAs for emergency medicine (EM) resident training were proposed in 2019 by CORD but have yet to be further evaluated. The EQual rubric is a validated tool to identify how EPAs align with published standards and a promising method to evaluate the EM EPAs.

Methods: Academic EM clinician-educators applied the EQual rubric to the 11 EM EPAs. Interrater reliability of the EQual rubric was analyzed using intraclass correlations (ICC) with an average-rating, two-way mixed-effects model measuring consistency. Mean and standard error of the mean (SEM) were calculated for each of the EPAs to identify those falling below a previously defined revision threshold.

Results: Four clinician-educators involved in undergraduate and graduate medical education from two academic medical centers participated in the study. The overall ICC for the EQual rubric was good at 0.73 (95%CI 0.65-0.79). Four items (29%) had poor reliability with ICCs < 0.4. The average EQual score for the EM EPAs was 3.89 (SEM ± 0.09) on a scale of 1 to 5. Six (55%) of the core EM EPAs scored below a revision threshold of 4.07.

Conclusions: The EQual rubric had good interrater reliability when implemented in EM clinician-educators and EPAs. Over half of the core EM EPAs performed below a previously defined cut point suggesting the need for revision. These results are limited by a small number of core EM EPAs and likely inexperience with EPAs in EM residency training programs in the US. Given the scope of EM, further research should evaluate the use of observational practice activities rather than EPAs in WBAs.

Table 1. Intraclass correlations for each item and the overall EQual rubric. Confidence intervals and P values are also reported.

EQual Item	N	ICC	95% CI	P value
1. This EPA has a clearly defined beginning and end	11	0.667	(0.165 to 0.900)	0.009
2. This EPA is independently executable to achieve a defined clinical outcome	11	0.738	(0.342 to 0.921)	0.002
3. This EPA is specific and focused	11	0.648	(0.115 to 0.894)	0.013
4. This EPA is observable in process	11	0.729	(0.320 to 0.918)	0.003
5. This EPA is measureable in outcome	11	0.603	(0.003 to 0.880)	0.025
6. This EPA is clearly distinguished from other EPAs in the framework	11	0.780	(0.449 to 0.934)	0.001
7. This EPA describes work that is essential and important to the profession	11	0.705	(0.260 to 0.911)	0.005
8. Performing this EPA leads to recognized output or outcome of labor	11	0.595	(-0.016 to 0.878)	0.027
9. The performance of this EPA in clinical practice is restricted to qualified personnel	11	0.369	(-0.585 to 0.809)	0.160
10. This EPA addresses professional work that is suitable for entrustment	11	0.755	(0.383 to 0.926)	0.001
11. This EPA requires the application of knowledge, skills, and/or attitudes (KSAs) acquired through training	11	0.464	(-0.346 to 0.838)	0.091
12. This EPA involves application and integration of multiple domains of competence	11	0.32	(-0.708 to 0.795)	0.199
13. The EPA title describes a task, not qualities or competencies of a learner	11	-0.323	(-2.321 to 0.601)	0.668
14. This EPA describes a task and avoids adjectives (or adverbs) that refer to proficiency	11	0.367	(-0.589 to 0.809)	0.161
Overall	154	0.729	(0.652 to 0.793)	< 0.001

ICC, intraclass correlation; *CI,* confidence interval.

Table 2. Mean EQual rubric score for each EM EPA. Items were rated on a range of scores from 1 to 5. Scores below the revision cut point are bold and grey.

EPA	Mean EQual Score (± SEM)
1. Manage a low-acuity, low-complexity "stable" patient.	4.09 (± 0.11)
2. Manage a low acuity, high-complexity "stable" patient.	4.09 (± 0.08)
3. Manage a potentially high-acuity complain in a "stable" patient.	4.09 (± 0.14)
4. Manage a high-acuity patient with a well-defined presentation, illness, or injury.	4.04 (± 0.16)
5. Manage a high-acuity, high-complexity patient (i.e., the undifferentiated unstable patient).	4.11 (± 0.23)
6. Manage multiple patients in the emergency department concomitantly.	3.79 (± 0.20)
7. Lead an ED team.	3.61 (± 0.09)
8. Transition patient care to other healthcare providers.	4.16 (± 0.18)
9. Manage interactions with consultants.	3.98 (± 0.09)
10. Manage complex and difficult situations.	3.30 (± 0.26)
11. Use recommended patient-safety and quality improvement processes.	3.53 (± 0.26)

EPA, entrustable professional activity; *SEM,* standard error of the mean.

31 Gender Differences in Language of Standardized Letter of Evaluation Narratives for Osteopathic Emergency Medicine Residency Applicants

John Ashurst, DO, MSc; Justina Truong, DO; Anthony Santarelli, PhD

Learning Objectives: To determine if there is a difference in the language used to describe male and female osteopathic EM applicants within the SLOE.

Background: The standardized letter of evaluation (SLOE) is used by emergency medicine (EM) faculty to determine who to interview and rank for residency. Data has shown that female allopathic applicants score higher in communal characteristics and have a greater number of ability words in the narrative portion of the SLOE than their male counterparts.

Objective: To determine if there is a difference in the language used to describe male and female osteopathic EM applicants within the narrative portion of the SLOE.

Methods: Invited osteopathic applicants to a three-year EM residency within a single application cycle were included. Exclusion criteria included allopathic applicants, applicants without a SLOE, or applicants with a SLOE only from the interviewing program. Data collected included applicant gender, age, Alpha Omega Alpha designation, Gold Humanism designation, COMLEX 1 and 2 scores, and SLOE narratives. The previously validated Linguistic Inquiry and Word Count (LIWC) product was used to analyze word counts from the narrative portion of each SLOE. Descriptive statistics, t-tests for nominal data, and the chi squared for categorical data was used.

Results: Of the 577 applicants, 88 were selected to interview and 50 were included in final analysis. There were no differences in baseline demographics between male and female applicants and females comprised one third of the final data set (Table 1). The average word count was 125.62 words with 16.55 words per sentence and no difference was noted between the sexes for either variable (p=0.17 and p=0.88) (Table 2). Words within the research category appeared more frequently in male applicants (p=0.04). No statistical difference between the genders was noted for any other category within the narrative portion of the SLOE.

Conclusion: The narrative portion of the SLOE does not appear to have an inherent gender bias for osteopathic medical students.

Table 1. Osteopathic applicant demographics.

Applicant Information				
Variable	Total (n = 50)	Male (n = 33)	Female (n = 17)	p-value
Age (y)	30 (25-38)	29.7 (3.513)	30.59 (2.917)	0.37
Comlex-1	577.3 (422-843)	584.2 (85.045)	563.8 (67.650)	0.40
Comlex-2	603.7 (421-819)	618.6 (80.063)	574.8 (65.190)	0.06
Alpha Omega	10 (20%)	27 (81.8%)	13 (76.5%)	0.65
Gold Humanism	9 (18%)	27 (81.8%)	14 (82.4%)	0.96

Table 2. Select LIWC output variables for osteopathic EM applicants. Data reported as median and interquartile range.

Variable	Total N=50 (95%CI)	Female n=17 (95% CI)	Male n=33 (95% CI)	p-value
Word count	125.62 (110.1-141.2)	110.65 (87.9-133.4)	133.33 (112.6-154.1)	0.17
Words per sentence	16.55 (14.9-18.2)	16.37 (12.7-20.0)	16.64 (14.9-18.3)	0.88
Affect	7.67 (6.9-8.4)	7.28 (5.9-8.6)	7.87 (6.9-8.8)	0.46
Positive	6.71 (5.9-7.5)	5.92 (4.3-7.5)	7.11 (6.3-8.0)	0.14
Negative	0.57 (0.3-0.8)	0.44 (0-0.9)	0.63 (0.3-0.9)	0.45
Social	11.60 (10.8-12.4)	11.61 (9.6-13.6)	11.60 (10.8-12.4)	0.99
Cognitive process	9.34 (8.4-10.3)	9.28 (7.6-11.0)	9.37 (8.2-10.6)	0.93
Affiliation	2.10 (1.6-2.6)	1.93 (1.1-2.8)	2.19 (1.6-2.8)	0.60
Achieve	4.79 (4.1-5.5)	4.81 (3.6-6.0)	4.78 (3.9-5.7)	0.97
Power	3.80 (3.3-4.3)	3.32 (2.7-4.0)	4.04 (3.3-4.8)	0.19
Reward	2.64 (2.2-3.1)	2.55 (1.9-3.2)	2.69 (2.0-3.4)	0.79
Risk	0.24 (0.1-0.4)	0.18 (0-0.4)	0.27 (0.1-0.5)	0.54
Standout	0.72 (0.5-1.0)	0.77 (0.3-1.2)	0.69 (0.4-1.0)	0.76
Ability	0.64 (0.4-0.9)	0.67 (0.2-1.1)	0.63 (0.4-0.9)	0.87
Grindstone	1.54 (1.2-1.9)	1.73 (1.0-2.4)	1.45 (1.0-1.9)	0.49
Teaching	1.44 (1.1-1.8)	1.47 (0.9-2.0)	1.43 (1.0-1.9)	0.92
Research	0.32 (0.1-0.5)	0.09 (-0.1-0.2	0.44 (0.1-0.7)	0.04
Communal	0.11 (0-0.2)	0.08 (0-0.2)	0.12 (0-0.2)	0.65

32 Gender in Emergency Medicine Residency

Julia Saak, BA, BHS; Julie Stilley, PhD; Christopher Sampson, MD

Learning Objectives: The purpose of this study is to investigate both the gender composition of EM residency leadership and to determine if more female residency leaders begets more female residents.

Background: It is estimated that 33% of academic EM physicians are women. However, there are no published data describing the representation of women in EM residency leadership positions.

Objectives: The purpose of this study is to investigate both the gender composition of EM residency leadership and to determine if more female residency leaders begets more female residents. It was hypothesized that there would be minority number of women in leadership positions, and that residency programs with more women in leadership will have more female residents.

Methods: Residency leadership and residents were determined by accessing each residency's website, or by contacting the program coordinator. Gender was determined via listed pronouns, or by first name and photographic masculine or feminine cues. Of the 268 EM programs, data was collected on leadership for 248 (93%), residents for 209 (78%), and chief residents for 77 (29%).

Results: Women comprised 40% of leadership: 31% of program directors (PD), 42% of associate PDs, and 48% of assistant PDs. 36% of residents and 48% of chief residents were women. Through multivariate correlation analysis, percentage of female residents was found to be most strongly correlated with female assistant PDs. Women comprised 34% of overall residency leadership and 25% of PDs in the south, 43% and 33% in the midwest, 44% and 28% in the northeast, and 45% and 44% in the west. The differences did not reach statistical significance overall, however, there were less female PDs in the south.

Conclusions: Women are not highly represented in top EM residency leadership positions, but become more prevalent in junior positions. Residency programs were found to have a larger percentage of female residents when an assistant PD is a woman. While not statistically significant overall, it was striking that there were regional differences in gender of leadership, and that there were less female PDs in the southern region.

33 Google Translate versus Doctors: Who prepares better discharge instructions?

Johnathan Nieves, MD; Alexis Cordone, MD; Francise Lamothe, MD; Vikye Beauport, MD; Daniel Patino-Calle, MD; Shawn London, MD

Learning Objectives: This study compared the accuracy of ED discharge instructions compare by native Spanish and Haitian Creole speakers compared to those prepared by a free, widely available machine learning translation tool (Google Translate).

Background: Medical students and residents are often required to care for patients with limited English proficiency but little guidance exists on the best way to prepare written discharge instructions (DCIs) in the patient's language. Consequently, some learners resort to unvalidated tools such as Google Translate (GT) to generate DCIs.

Objectives: It was hypothesized that if DCIs are translated from English to Spanish or Haitian Creole using human translators (HT) versus GT, the HT DCIs will (1) contain fewer errors and (2) be preferable to native speakers.

Methods: 211 DCIs were translated by blinded physicians who are native speakers or certified translators of Spanish or Creole. In Part 1 of the study, two Spanish-speaking and one Creole-speaking physicians who were not involved in data collection or HT reviewed the DCIs in English and evaluated errors in the HT and GT translations. In Part 2, the reviewers ranked HT and GT based on the accuracy and readability of the translations.

Results: In Part 1, the Spanish GT DCIs had more errors than HT (634 and 399 for GT versus 299 and 284 for HT), however, this difference was not statistically significant (k=0.47). Creole GT DCIs had more errors than HT (1720 for GT and 490 for HT). In Part 2, the Spanish reviewers preferred HT (82.0% and 77.9%); the Creole reviewer preferred the HT (93.3%). Notably, the Spanish GT DCIs, unlike the HT DCIs, included errors that would cause patients to miss follow-up care and overdose on medication. Moreover, many basic medical terms including "primary care doctor" and "sutures," produced nonsensical translations using GT in Creole.

Conclusions: The data suggests that HT DCIs had fewer errors than GT. Moreover, HT DCIs were preferred by reviewers for both languages. More importantly, GT may provide unintelligible or potentially harmful translations. Therefore, clinicians must remain vigilant of the potential risks of tools such as GT.

34 Hypoglycemia after Insulin for Hyperkalemia in Hemodialysis Patients

Patrick Meloy, MD; Lauren Howell, PharmD; Amy Wang, PharmD Candidate; Trinh Vu, PharmD; Stephanie Zack, PharmD; Jess Corio, PharmD

Learning Objectives: To determine the risk factors for development of hypoglycemia, after administration of IV insulin, for the treatment of hyperkalemia, in patients requiring hemodialysis.

Background: Hyperkalemia is a common life-threatening complication in patients with end-stage renal disease (ESRD) requiring hemodialysis (HD). Acute treatment involves IV insulin, though this can lead to hypoglycemia (HG).

Objectives: To determine risk factors for developing HG in ESRD patients treated with IV insulin for hyperkalemia in the ED. Methods: A retrospective chart review from January 1, 2014, to January 1, 2019, was conducted to find ESRD patients requiring HD who developed HG (defined as glucose ≤ 70 mg/dL) following the administration of IV insulin for the treatment of hyperkalemia in the ED. Demographics, laboratory values, insulin and dextrose doses, and the lowest glucose within six hours of insulin administration were collected. Patients were excluded from the study if they did not have a repeat glucose within six hours of insulin administration, did not have a glucose ≤ 70 mg/dL, or were < 18 years old.

Results: Of the 128 patients who had a BG check within six hours of insulin therapy for hyperkalemia, 54 patients developed HG of which 16 had severe HG (defined as BG ≤ 40 mg/dL). A majority of patients were insulin naïve (83%) with only ten patients having a past medical history of diabetes. The average initial blood glucose of patients with HG and severe HG was 87 and 86, respectively. 63% of patients received 10 units of IV insulin, with 31% receiving 5 units. 76% of patients received 25 grams dextrose, with 20% receiving 50-75 grams, and 4% not requiring any dextrose. Conclusions: We find the incidence of HG after treatment with IV insulin occurred at three times the rate previously identified in a non-HD dependent population. The risk factors identified here align with previous studies identifying insulin dose and being insulin naïve being associated with HG. Baseline blood glucose levels in this study were higher than those in previous studies, implying that HD dependent patients may be at risk for HG despite their initial glucose reading.

35 Improving Staff Attitudes Towards Patients Presenting to the Emergency Department with Opioid Use Disorder: Is An Online Module Enough?

Benjamin Finard, BS Biomedical Engineering; Joseph Arciprete, BS Biochemistry; Madalene Zale, MPH; Dimitrios Papanagnou, MD; Benjamin Slovis, MD, MA; Carissa Walkosak, BA, BS; Hannah Smith, Ph.D.

Learning Objectives: 1) Characterize bias towards patients with OUD across staff members in an academic ED in Philadelphia, an epicenter of the opioid epidemic. 2) Determine the effectiveness of an online module in changing staff attitudes towards patients with OUD.

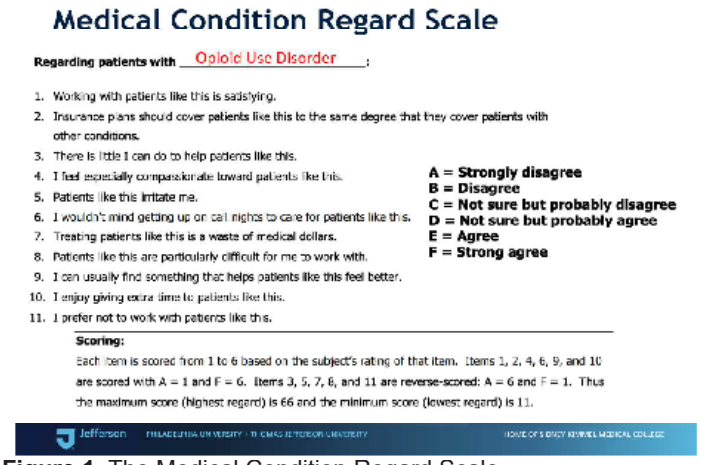
Background: Significant stigma surrounds patients with opioid use disorder (OUD). This stigma repeatedly follows patients into the ED and negatively influences care. All ED staff impact the patient journey in the ED and the success with which OUD patients receive a warm handoff to a recovery organization.

Objectives: The authors sought to: 1) characterize bias towards patients with OUD across all staff members in an academic ED in Philadelphia, an epicenter of the opioid epidemic; and 2) determine the effectiveness of an online module in changing staff attitudes towards patients with OUD. We hypothesized that an online module may serve as a useful tool in changing staff attitudes towards patients with OUD.

Methods: The authors developed and deployed a survey to 463 ED clinical and non-clinical staff members through Qualtrics. The survey was informed by the validated Medical Condition Regard Scale (MCRS) to capture staff sentiments towards patients with OUD (Figure 1). Respondents were subsequently directed to an online Articulate Rise module that provided training on trauma-informed approaches to caring for patients with OUD. Continuing education credit was offered. Upon module completion, respondents received a follow-up survey 1 month later to assess knowledge retention and detect changes in reported attitudes.

Results: Results are in progress. 181 staff completed the pre-survey, module, and post-survey (response rate 40%). Preliminary data shows that across all job types surveyed, change in MCRS score did not significantly change after completion of the module (Figure 1).

Conclusions: Preliminary data suggests that an online module to train ED staff on trauma-informed care is not an effective tool to change attitudes towards patients with OUD. As the epidemic continues to escalate, educators will need to identify more effective methods to engage staff members in order to improve outcomes of patients with OUD who present to the ED.


Medical Condition Regard Scale

Regarding patients with Opioid Use Disorder:

1. Working with patients like this is satisfying.
2. Insurance plans should cover patients like this to the same degree that they cover patients with other conditions.
3. There is little I can do to help patients like this.
4. I feel especially compassionate toward patients like this.
5. Patients like this irritate me.
6. I wouldn't mind getting up on call nights to care for patients like this.
7. Treating patients like this is a waste of medical dollars.
8. Patients like this are particularly difficult for me to work with.
9. I can usually find something that helps patients like this feel better.
10. I enjoy giving extra time to patients like this.
11. I prefer not to work with patients like this.

A = Strongly disagree
B = Disagree
C = Not sure but probably disagree
D = Not sure but probably agree
E = Agree
F = Strong agree

Scoring:
Each item is scored from 1 to 6 based on the subject's rating of that item. Items 1, 2, 4, 6, 9, and 10 are scored with A = 1 and F = 6. Items 3, 5, 7, 8, and 11 are reverse-scored: A = 6 and F = 1. Thus the maximum score (highest regard) is 66 and the minimum score (lowest regard) is 11.

Jefferson PHILADELPHIA UNIVERSITY + THOMAS JEFFERSON UNIVERSITY HOME OF SIDNEY KIMMEL MEDICAL COLLEGE

Figure 1. The Medical Condition Regard Scale.

36 Incorporating a Resident-Driven Mentorship Program into Emergency Medicine Clerkship Rotations

Sabena Vaswani, MD; Daniel Novak, DO; Jeanette Kurbedin, DO; Eric Lee, MD; Arlene Chung, MD

Learning Objectives: Goal of this study is to determine

whether medical students feel they benefit from a resident driven mentorship program during their audition rotations.

Background: Mentorship is important for professional growth and success in medicine. There are few formal mentorship programs for medical students on audition rotations.

Objective: We launched an EM resident-driven mentorship program to help medical students excel in their clerkships, develop relationships, and navigate residency applications. We hypothesize that students will rate the mentoring positively and will report that it improved their performance.

Method: Students were assigned a self-selected EM resident mentor for their four-week clerkship at a single institution. Allopathic and osteopathic students were matched with residents from MD or DO schools, respectively. Mentors were instructed to review: patient presentations, differential diagnoses, clinical decision-making tools, rotation advice, and the application and match process. Mentors were instructed to meet with their mentees and to check-in weekly. Following the rotation, students were sent an online anonymous survey consisting of 6 multiple choice and 3 free response questions. Simple descriptive statistics and qualitative methods were employed for data analysis. Initial coding was performed independently by two study authors and then reviewed by a third author with experience in qualitative methodology. Suggestions were merged via consensus into a final code set that was used for thematic analysis.

Result: Six audition rotations occurred over the study period. Of the 47 students, 74% (n=35) responded to our survey. 97% (n=34) of participants recommended continuing this program, 91% (n=32) rated this program helpful, and 64% (n=16) stated that this improved their success on the rotation. Preliminary qualitative analysis of students' responses revealed the themes in Figure 1.

Conclusion: Preliminary data suggests that students found having a mentor during their audition rotations was meaningful. We believe students can benefit from a resident-driven mentorship program during their auditions.

Theme	Student Response
Clerkship Success	*"I met him the first week of the clerkship and he provided me with some useful information on how to tackle the rest of the rotation. He helped me understand what my role should be."*
Application Advice	*"Getting outside feedback from someone who has so recently experienced the same challenges and found their way through those hurdles was just what I needed."*
Enhanced Medical Knowledge	*"They can teach from a supervising role because they went through intern year and learned from their own mistakes."*
Team Camaraderie	*"It can be hard adjusting to a new environment and a friendly face definitely helped."*
Program Insights	*The "mentor program was very good for general information and also to get a feel for the type of program..."*
Safe Space	*"It was helpful to have support from someone who truly wanted me to succeed and was willing to help me through the challenges I faced."*

Figure 1.

37 Integration of Self Evaluation into Emergency Medicine Resident Assessment and Direction (I SEEM RAD)

Jenna Geers, MB BCh BAO; Benjamin Sandefur, MD; Aidan Mullan, MA; James Colletti, MD; James Homme, MD

Learning Objectives: We aim to examine resident self-evaluation using ACGME Milestone criteria as a potential tool in improving the quality of feedback given at scheduled semiannual meetings, which occur after meetings of faculty committees to evaluate residents on Milestone criteria.

Background: In 2013 the Accreditation Council of Graduate Medical Education (ACGME) introduced "Milestones" designed to nationally standardize the evaluation of residents during required semiannual Clinical Competency Committee (CCC) meetings. Previous studies compare resident self-evaluation on milestones to faculty evaluation, with varying degrees of agreement, but integration of self-evaluation into the formative feedback process has not yet been directly studied.

Objective: To compare the quality of feedback given in semiannual reviews before and after the incorporation of resident self-evaluation into the feedback process.

Methods: This was an interventional study conducted in a single residency program at a major academic hospital over one calendar year. Residents first engaged in a semiannual review without self-evaluating. At the next semiannual review, the same residents completed a self-evaluation of ACGME milestones which was provided to the faculty member assigned to conduct their semiannual review. After both semiannual reviews residents and faculty completed brief surveys rating feedback quality. Two-sided Wilcoxon signed-rank tests were used in comparison analysis.

Results: One resident did not self-evaluate prior to the semiannual review and was excluded from analysis. Residents found feedback after the self-assessment more actionable ($p = .013$), insightful ($p = .010$), and better overall ($p = .025$). Similarly, faculty felt their feedback was more actionable ($p < .001$), more insightful ($p < .001$), better communicated ($p < .001$), led to improved resident understanding of milestones ($p < .001$), and were overall more satisfied ($p < .001$).

Conclusion: Integration of self-evaluation into semiannual reviews improves feedback given to residents as perceived by both residents and faculty. Although limited by sample size, the results are promising for a simple, evidence-based intervention to improve feedback during an existing mandated feedback opportunity.

38 Interviewers with lower academic rank had higher odds of changing their scores for applicants after a group discussion

Ryan Coughlin, MD; Brian Wood, MD; Jessica Bod, MD; Alina Tsyrulnik, MD; David Della-Giustina, MD; Jessica Ray, PhD; Ambrose Wong, MD; Katja Goldflam, MD

Learning Objectives: Interviewers with lower academic rank had higher odds of changing scores after a group discussion in this cross-sectional observational study. Interviewer sex, initial score, and interviewee final rank group (top, middle, or lower third) also had significant

associations with change in score.

Background: Stakes are high for all parties involved in residency recruitment, and a standardized interview scoring process does not exist. Interviewers should consider external influences on their candidate rankings.

Objective: We determined the effect of formal post-interview discussions on the interviewer scores of candidates. We hypothesized that interviewer characteristics may be associated with changes in post-discussion applicant scores.

Methods: We conducted a cross-sectional observational study of interviewee scores for all applicants to a four-year emergency medicine residency program during the 2017-18 cycle. Scores were obtained for each applicant: first, immediately following the interview and second, following the discussion. We undertook a descriptive analysis of the data and created a logistic regression model to determine odds that the applicant scores changed from pre- and post-discussion ratings for significant interviewee and interviewer factors. The following variables were included in an odds ratio (OR) analysis: interviewer academic rank, interviewer sex, score prior to the discussion, and interviewee final rank group (top third, middle third, lower third of rank list).

Results: Twenty-four interviewers and 211 interviewees created 471 unique interviewer-interviewee pairings and scores. In total, 216 (45.8%) scores changed from pre- to post-discussion. Using logistic regression, we found interviewers at lower academic ranks had significantly higher odds of changing their applicant score compared to interviewers at professor rank. Assistant professors (OR 12.777, [5.465-29.870]) and chief residents (OR 9.547, [3.921-23.243]) had the highest odds of a post-discussion score change. Interviewer sex, initial score, and interviewee final rank group also had significant associations with change in score (Table 1).

Conclusions: Interviewers with lower academic rank had higher odds of changing their scores for applicants after a group discussion.

Table 1. Odds of changing score following discussion.

	Adjusted OR (95% CI)	p-value
Interviewer Sex		
Male	Ref	--
Female	0.485 (0.263, 0.894)	<0.020
Interviewer Rank		
Resident	4.940 (2.155, 11.329)	<0.001
Chief Resident	9.547 (3.921, 23.243)	<0.001
Instructor	4.311 (2.024, 9.184)	<0.001
Assistant Professor	12.777 (5.465, 29.870)	<0.001
Associate Professor	9.562 (2.600, 25.403)	<0.001
Professor	Ref	--
Interviewee Rank List Group		
Top Third	0.261(0.141, 0.483)	<0.001
Middle Third	0.342 (0.198, 0.591)	<0.001
Bottom Third	Ref	--
Score prior to debrief	1.154 (1.015, 1.312)	0.029

39 Learning curves for laryngoscopy devices in emergency medicine training: A National Emergency Airway Registry Study

Samuel Garcia, MD; Benjamin Sandefur, MD; Ronna Campbell, MD; Brian Driver, MD; Michael April, MD; Jestin Carlson, MD; Ron Walls, MD; Calvin Brown, MD

Learning Objectives: To compare the learning curve with direct laryngoscope (DL), hyperangulated blade video laryngoscope (HAVL), and standard geometry blade video laryngoscopes (SGVL) in EM trainees.

Background: First attempt success is important to mitigate adverse events during emergency department (ED) intubations. Emergency medicine (EM) trainees must be adequately trained using a variety of laryngoscopy devices. Little is known about the learning curves associated with different types of laryngoscopy devices among EM trainees.

Objective: To compare the learning curve with direct laryngoscope (DL), hyperangulated blade video laryngoscope (HAVL), and standard geometry blade video laryngoscopes (SGVL) in EM trainees.

Methods: We analyzed prospectively collected data from ED patients enrolled in the National Emergency Airway Registry who underwent an orotracheal intubation first attempt by an EM trainee from January 1, 2016 to December 31, 2018. We categorized EM trainees by post-graduate year (PGY) into PGY-1, PGY-2, PGY-3+. PGY-4 or PGY-5 trainees were included in the PGY-3+ group. We used mixed-effects logistic regression including potential confounding covariates of patient age, gender, obesity, medical or traumatic indication, suspected difficult airway, and presence of one or more difficult airway characteristics to assess the association between PGY of training and first attempt success by device.

Results: Among 15,204 included intubations, the largest proportion were performed by PGY3+ trainees (Table). DL was associated with improved first-attempt success for PGY-2 (aOR 1.41; 95% CI 1.09-1.82), and PGY-3+ (aOR 1.76; 1.36-2.27) trainees compared to PGY-1. The HAVL was associated with improvement in first-attempt success for PGY-2 (aOR 1.51; 1.1-2.05) and PGY-3+ (aOR 1.56; 1.15-2.13) trainees compared to PGY-1. For SGVL only PGY-3+ (aOR 1.72; 1.25-2.36), was associated with improved first-attempt success for compared to PGY-1.

Conclusion: EM trainee proficiency with each type of laryngoscope was greatest at the PGY3+ level of training demonstrating the importance of continued endotracheal intubation.

Table. Laryngoscope device used based on PGY level.

	PGY-1 N (%) (N=1855)	PGY-2 N (%) (N=5135)	PGY-3+ N (%) (N=8214)
DL	528 (28)	1852 (36)	2421 (29)
HAVL	631 (34)	1486 (29)	1791 (22)
SGVL	696 (38)	1797 (35)	4002 (49)

PGY, post-graduate year; *DL,* direct laryngoscope; *HAVL,* hyperangulated blade vido laygoscope; *SGVL,* standar geometry blade vide laryngoscope.

40 Likelihood Patients with Opioid Use Disorder Encounter ED Staff Members who Hold them in Low Regard: Lessons from Computer Simulation Modeling

Benjamin Finard, BS Biomedical Engineering; Joseph Arciprete, BS Biochemistry; Madalene Zale, MPH; Dimitrios Papanagnou, MD; Benjamin Slovis, MD, MA; Carissa Walkosak, BA, BS; Hannah Smith, PhD

Learning Objectives: 1) Capture ED staff member regard for patients with OUD 2) Determine the likelihood with which a patient with OUD presenting to an ED would interface with staff who hold this subset of the population in low regard.

Hypothesis: OUD patients will likely encounter staff members with low regard

Background: Significant stigma surrounds patients with opioid use disorder (OUD). Stigma repeatedly follows patients into the ED and impacts care. Little is known about the patient's journey in the ED and the negative regard patients with OUD receive from staff.

Objectives: We sought to: 1) capture ED staff member regard for patients with OUD; and 2) determine the likelihood with which a patient with OUD presenting to an ED would interface with staff who hold this subset of the population in low regard. Given numerous touchpoints of an ED visit, we hypothesize that OUD patients would likely encounter staff members with low regard for OUD patients.

Methods: We deployed the validated Medical Condition Regard Scale (MCRS) to 463 ED staff of an academic ED located in Philadelphia to capture sentiments towards patients with OUD. Data was analyzed by job type (i.e., nurses, physicians, technicians). Descriptive statistics (means, standard deviations) were calculated. Following a flow diagram (Figure 1), we created a simulation engine in Python to simulate the experience a patient with OUD would have in an actual ED. Each interaction corresponds to a juncture point where a patient meets a new staff member during the visit. The staff member is randomly selected from the pool of staff members with that job type, and their respective MCRS score is recorded. The simulation was run for 100,000 virtual patients, each with 5 staff member interactions.

Results: 429 staff members completed the MCRS (response rate 93%). Patients with OUD will encounter someone with significantly low regard for their condition 15% of the time (2 SD below mean) and someone with significantly high regard for their condition 12% of the time (2 SD above mean).

Conclusions: Results suggest that patients with OUD may face bias when presenting to an ED. As a marginalized population, the probability patients with OUD will avoid care may rise if changes are not made to improve their experience.

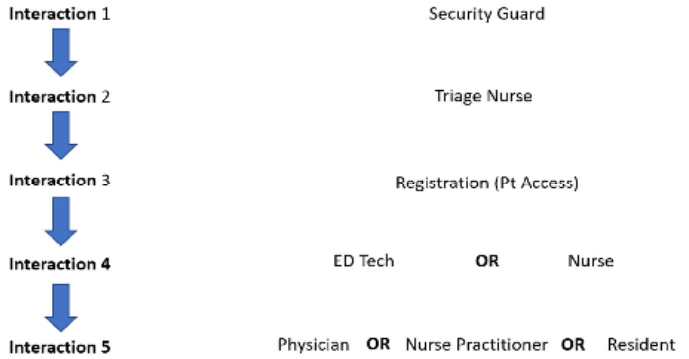


Figure 1. Flow diagram of a sample ED visit with interactions with specific staff members.

41 Lockdown Medical Education: Utilization and Effectiveness of Virtual Modalities for Pandemic-Safe Training

Adrian Cotarelo, MD, MHS; Carmen Martinez Martinez, MD; Danielle Langan, DO; Patrick Hinfey, MD; Mike Anana, MD; Jessica Noonan, MD; Jason David, MD; Aaron Johnson, MD; Saira Hoda, MD; Slack Intern Curriculum Consortium

Learning Objectives: This study aimed to identify and measure effectiveness of common virtual education modalities utilized during the COVID-19 pandemic, as well as which of these modalities are perceived as most effective by medical students.

Background: During the 2019 Novel Coronavirus (COVID-19) pandemic, newly-matched "pre-interns" were displaced from clinical rotations and in-person didactics, many of which are bridges to residency preparedness. During this near-total shift towards virtual medical education, several modalities became commonplace. There has been no large-scale investigation of utilization or effectiveness of these virtual initiatives.

Objectives: This study aimed to identify and measure effectiveness of common virtual education modalities utilized during the COVID-19 pandemic, with the hypothesis that

active learning methods would be more used and effective.

Methods: In spring 2020, two online surveys were distributed assessing time since last in-person clinical experience, and Likert-scale (1-5) questions regarding use and effectiveness of virtual education modalities. Results were analyzed using descriptive statistics.

Results: 27 EM residencies were recruited, with 311 pre-intern participants. 289 (92.9%) completed pre-surveys, and 240 (77.2%) completed post-surveys. They reported the number of weeks since performing a physical examination (median = 8, IQR 7, 12), attending an in-person didactic (median = 10, IQR 8, 15), and of rotation displacement (median = 4, IQR 2, 6). Common education tools included online modules (n=210), podcasts (n=193), and social-media based education (n=195). Effective tools included podcasts (Mean = 4.116, SD = 0.856), online question bank use (Mean = 4.052, SD = 0.872), and FOAMed resources (Mean = 3.994, SD = 0.904).

Conclusions: Pre-interns are entering residency disconnected from in-person clinical education, reflecting a need for effective remote teaching. Interactive options (podcasts, question banks, and FOAMed) were cited as more effective than traditional offline options (textbook and journal article reading). Identifying popular, effective virtual modalities can guide education initiatives during the present and future pandemics.

Table.

Educational Intervention Effectiveness	Frequency (%)	Mean (SD)	Confidence Interval (95%)
Podcasts	193	4.166 (0.856)	(4.045, 4.287)
Question Banks	77	4.052 (0.872)	(3.857, 4.247)
FOAMed	154	3.994 (0.904)	(3.851, 4.137)
Other Online Study Package	119	3.899 (0.951)	(3.728, 4.07)
Online Videos (YouTube, Other)	161	3.882 (0.736)	(3.768, 3.996)
Problem-Based Learning	114	3.667 (0.928)	(3.497, 3.837)
Other Social Media-Based Education	195	3.631 (0.988)	(3.492, 3.77)
Live Virtual Lectures	187	3.604 (0.906)	(3.474, 3.734)
Team-Based Learning	87	3.506 (0.987)	(3.299, 3.713)
Online Modules	210	3.462 (0.993)	(3.328, 3.596)
Recorded Lectures	115	3.357 (0.91)	(3.191, 3.523)
Textbook Reading	121	3.306 (1.007)	(3.127, 3.485)
Journal Article Reading	168	3.286 (0.856)	(3.157, 3.415)

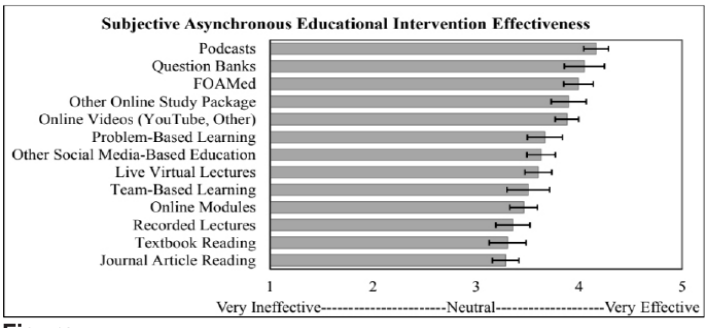


Figure.

42 Measuring Depression, Stress, Anxiety and Resilience Levels During the Covid-19 Pandemic Using Validated Psychometric Testing

Sarah Bella, DO; frederick fiesseler, DO; Kristen Walsh, MD; Ashley Flannery, DO; Brian Walsh, MD

Learning Objectives: To describe the prevalence of depression, anxiety, stress and resilience in EM residents during the Covid-19 pandemic

Background: EM residents were already known to be high-risk for depression and burnout; in all likelihood the Covid-19 pandemic has added to this risk. In addition to the understandable work stressors, social isolation caused by the lockdowns likely has affected their support structure negatively.

Objectives: Using validated psychometric testing, we sought to determine the levels of depression, anxiety, stress, and resilience in EM residents in a region severely impacted by the pandemic.

Methods: Setting: An EM residency program in the state with the highest per-capita deaths from Covid-19. All EM residents were surveyed eight months into the pandemic using the Depression, Anxiety, Stress Scales (DASS) and Brief Resilience Scale (BRS). Both studies have been validated in the psychology literature across multiple settings. Surveys were anonymous to promote honesty in answers. Levels of depression, anxiety, stress, and resilience were determined. Demographic information was also collected.

Results: 23 of 27 residents (85%) completed the survey. Using the DASS, 48% (95%CI 27-69) were found to have at least mild depression, with 17% (95%CI 2-33) found to have "severe" or "extremely severe" depression. 35% (95%CI 15-55) were found to have at least mild levels of anxiety, with 4% (95%CI -4 to 13) having "severe" or "extremely severe" anxiety. 52% (95%CI 31-73) were found to have at least mild stress, with 13% (95%CI -1 to 27) found to have "severe" or "extremely severe" stress. Using the BRS, 9% (95%CI -3 to 20) were found to have low levels of resilience.

Conclusion: While we knew EM residents (physicians) are high-risk for depression and burnout, the levels of depression and stress measured by validated psychometric testing during the Covid-19 pandemic were concerning. Although the residency has increased its wellness activities significantly, it appears much more needs to be done to help residents get through this extremely difficult situation.

43 Mitigating the Gender Gap: How "DOCTOR" badges affect physician identity

Jenny Chang, MD; Joshua Silverberg, MD; Michael Jones, MD; John Arbo, MD; Jill Corbo, MD

Learning Objectives: To elucidate the frequency of

physician misidentification in the ED and evaluate whether a low-cost intervention can help reduce rates and improve overall physician wellness using an observational study.

Background: Multiple studies have shown that only a small fraction of patients are able to identify their physician. Physician misidentification impacts patient care, patient satisfaction, and physician wellbeing.

Objectives: Our study aims to evaluate whether the incorporation of "DOCTOR" badges can improve identification and the overall wellness of EM physicians. We hypothesize that the rate of EM physician misidentification would be more frequent among female physicians and that badges can be a low-cost tool to rectify this problem.

Methods: A voluntary anonymized survey was distributed to 83 EM residents and 28 EM Attendings working in a large urban academic center. All physicians were given a badge to wear and then were re-surveyed. Descriptive data are presented as means with standard deviation, percentages, and 95% confidence intervals. Mean rate of misidentification were compared pre and post "DOCTOR" badges using a Student's t-test.

Results: Physician response rates and demographics are given in Table 1. 97% of female EM physicians are misidentified compared to 43% of male EM physicians 95% CI: [37,66], p<0.0001. After wearing the badges, there was a decrease in misidentification of female EM physicians to 81.6%, p=0.03 and 73.7% of female physicians reported feeling more valued vs 44.9% male physician 95% CI [7.9,46], p=0.007. Similarly, 64.3% EM physicians felt less frustration with misclassification, 81.6% female physicians vs. 51% male physicians, 95% CI [10.5,47], p=0.0033.

Table.

	Pre n=98 N (%)	Post n=87 N (%)
Gender:		
Male	60 (61)	49 (56)
Female	38 (39)	38 (44)
Race:		
Caucasian	42 (43)	34 (39)
Black	9 (9.2)	9 (10.4)
Hispanic	7 (7.2)	9 (10.4)
East Asian/Pacific Islander	14 (14.3)	12 (13.8)
Southeast Asian	20 (20.3)	18 (20.7)
Other	6 (6)	5 (5.7)
Level of training:		
Resident	75 (76.5)	71 (82)
Attending	23 (23.5)	16 (18)

Conclusions: Female EM physicians are disproportionately misidentified by patients and their families and are more likely to feel undervalued. We found that the use of "DOCTOR" badges decreased misidentification and improved wellness. Therefore, having EM physicians wear a "DOCTOR" badge may be an effective long-term solution. Reported efficacy may have been even higher as our study was partially limited by the COVID-19 pandemic when badges became obscured by PPE.

44 Narrative Medicine Workshops for Emergency Medicine Residents

Zayir Malik,MD; Michael Blackie, PhD; Alan Schwartz, PhD; James Ahn, MD, MHPE

Learning Objectives: Our goal was to evaluate the effect on and resident perceptions of incorporating narrative medicine workshops into residency education.

Background: EM residents face emotional challenges every day: conflicts with patients and providers, witnessing trauma, uncertain decision making, and a chaotic work environment. Despite these, residency education lacks training for emotional processing and empathetic skill building. Narrative medicine, a form of humanities education, may foster empathy and reduce emotional exhaustion; its value has been studied in undergraduate and graduate medical settings, but not within an EM residency program.

Objectives: Our goal was to evaluate the effect on and resident perceptions of incorporating narrative medicine workshops into residency education.

Curricular Design: We held two hour-long workshops three months apart in an urban, academic, EM residency. They were led by EM faculty and consisted of four parts: an aloud, group reading of an EM-related text, a guided discussion of themes, prompt-driven reflective writing, and a conversation about the writings and their themes. We chose to use group discussion and reflection as they are strategies suitable for higher order cognitive learning and allow learners to explore different perspectives. The use of multiple educational methods served to provide reinforcement of learning. Further, this design is commonly used to teach narrative medicine. We used post-intervention surveys to evaluate our curriculum.

Impact: This was the first study that sought to evaluate a narrative medicine curriculum within an EM residency. 19 residents completed an evaluative survey; a majority (n=18, 95%) of residents agreed that narrative medicine should be a standard part of didactics. Residents also agreed that the workshops helped them process difficult events (n=17, 90%), encouraged creative thinking (n=17, 90%), and brought them closer to their colleagues (n=15, 80%). Results suggest that residents are eager to learn ways to process the emotional challenges inherent to EM and that applying a narrative medicine approach may be beneficial.

45 National Assessment of Residency Wellness Initiatives: Assessment, Barriers, and Opportunities

Melissa Parsons, MD; Matthew Zuckerman, MD; Sonia Twigg, MBBS, FACEM; Carmen J Martinez Martinez, MD MSMEd; Michael Gottlieb, MD

Learning Objectives: This study aimed to survey Emergency Medicine residency programs to identify what wellness initiatives they have in place or plan to implement, as well as what barriers to implementation they faced and what resources were utilized.

Background: "Well-being" is mentioned 33 times in the Accreditation Council for Graduate Medical Education (ACGME) Emergency Medicine (EM) Core Requirements. Despite the recognition that wellness is an important component of graduate medical education, a clear plan of how to implement wellness initiatives is lacking. This study aimed to survey EM residency programs to identify what wellness initiatives they have in place, as well as barriers to implementation and resources utilized.

Methods: This was a cross-sectional survey study performed from November 2019 through January 2020.

A literature search identified existing published wellness interventions and existing barriers. The interventions and barriers were compiled to create a survey, which was piloted among five program directors and assistant program directors with feedback directly incorporated into the survey. The survey was sent to program leadership at all 223 ACGME-accredited EM residency programs in the United States.

Results: Of programs surveyed, 95 programs were included. The most common wellness interventions reported were resident retreats (91%), group events (90%), formal mentorship (74%) and wellness committees (66%). The majority of the programs reported at least a moderate overall resident wellness improvement as a result of implementing the wellness interventions. Reported factors that contributed to the successful implementation of wellness interventions were faculty involvement (78%), resident involvement (78%), department chair support (51%), institutional support (44%) and financial support (36%). In contrast, financial support (65%) and limited time (62%) were the most commonly reported barriers that prevented the implementation of wellness interventions.

Conclusions: Resident wellness is an important aspect of residency training. The use of wellness interventions showed an overall resident wellness improvement. Successful programs have financial, institutional, and chair support.

46 Outcome Assessment of Medical Education Fellowships in Emergency Medicine

Jaime Jordan, MD, MAEd; James Ahn, MD; David Diller, MD; Jeff Riddell, MD; Ryan Pedigo, MD; Mike Gisondi, MD

Learning Objectives: To assess career outcomes of medical education fellowship graduates.

Background: Post graduate medical education fellowships in emergency medicine provide training in education theory, instructional techniques, program administration, leadership, and scholarship. The longitudinal impact of this training is unknown.

Objectives: To assess career outcomes of medical education fellowship graduates.

Methods: We analyzed curriculum vitae (CV) of medical education fellowship graduates in the United States. Graduates were identified through program records and invited to participate by email. We developed and piloted a data abstraction form prior to use. Outcomes included training characteristics, academic appointments, leadership, teaching, and scholarship.

Results: 71/91 (78%) of graduates submitted CVs. Thirty-two (45.1%) completed a one-year fellowship and 39 (54.9%) completed a 2-year fellowship. The median graduation year was 2016 (range 1997-2020). Nineteen (26.8%) completed an advanced degree during fellowship. Most (88.7%) are currently working in academics. Current employment characteristics of graduates are shown in Table 1. Graduate outcomes are summarized in Table 2.

Conclusions: Medical education fellowship graduates are successful in teaching, leadership, and scholarship.

Table 1. Employment Characteristics of Medical Education

	N (%)
Current position[a]	
Program director	6 (8.5)
Assistant/Associate Program Director	27 (38.0)
Clerkship director	3 (4.2)
Assistant/Associate Clerkship Director	4 (5.6)
Medical Education Fellowship Director	8 (11.3)
Director of Simulation	3 (4.2)
Vice Chair of Education	2 (2.8)
Assistant/Associate Dean	2 (2.8)
Core faculty	9 (12.7)
Other	23 (32.4)
Currently working in academics	
Yes	63(88.7)
No	8 (11.3)
Region of practice	
West	37 (52.1)
Midwest	14 (19.7)
South	3 (4.2)
Northeast	15 (21.1)
Other/Unknown	2 (2.8)
Current academic rank	
Clinical Instructor	3 (4.2)
Assistant Professor	42 (59.2)
Associate Professor	8 (11.3)
Professor	3 (4.2)
Other/unknown	14 (19.7)

[a]An individual may hold more than one position.

Table 2. Career outcomes of education fellowship graduates.

	N (%)
Local leadership positions	
Continuing medical education	
Vice Chair of Education	6 (8.5)
Other	12 (16.9)
Graduate medical education	
Residency Program Director	8 (11.3)
Assistant/Associate Residency Program Director	39 (54.9)
Medical Education Fellowship Director	9 (12.7)
Assistant/Associate Medical Education Fellowship Director	2 (2.8)
Other	8 (11.3)
Undergraduate medical education	
Clerkship Director	14 (19.7)
Assistant/Associate Clerkship Director	9 (12.7)
Assistant Dean	1 (1.4)
Associate Dean	1 (1.4)
Medical school course director	11 (15.5)
Other	6 (8.5)
National leadership positions in medical education	
Chair of a national committee	18 (25.4)
Member of professional society board of directors	5 (7.0)
Other	8 (11.3)
Committee service in medical education	
National	48 (67.6)
Regional	12 (16.9)
Local	57 (80.3)
Awards in medical education (mean ± SD)	
National	1.27 ± 2.03
Regional	0.27 ± 1.07
Local	2.61 ± 3.76
Medical education presentations (mean ± SD)	
National	7.63 ± 10.83
Regional	1.89 ±5.15
External grand rounds	1.38 ±4.14
Non-medical education presentations (mean ± SD)	
National	8.59 ± 28.06
Regional	2.08 ± 4.49
External grand rounds	1.49 ± 3.77
Journal editorial board member	10 (14.1)
Journal reviewer	34 (47.9)
Medical education publications (mean ± SD)	
Research, peer-reviewed	4.99 ± 6.17
Non-research, peer-reviewed	0.96 ± 2.38
Non-peer-reviewed publications	0.39 ±1.11
Digital scholarship	1.65 ± 4.31
Non-medical education publications (mean ± SD)	

47 Peer Coaching Increases Emergency Medicine Faculty Ability to Perform and Teach Awake Fiberoptic Intubation

Christopher Dimza, BS; Colin McCloskey, MD; Matthew Stull, MD

Learning Objectives: Our study sought to evaluate the effect of peer coaching as a continuing medical education (CME) modality to improve faculty performance and teaching of awake fiberoptic intubation (AFOI).

Background: Once training is complete, physicians must continue growing their procedural skills while still developing their learners. High acuity, low opportunity procedures, such as awake fiberoptic intubation (AFOI), are challenging for both novel skill acquisition and teaching to learners.

Objective: Our study sought to evaluate the effect of peer coaching as a continuing medical education (CME) modality to improve faculty performance and teaching of AFOI.

Methods: Academic emergency medicine faculty at a single tertiary-care center participated in a prospective pre/post-interventional assessment of a peer coaching educational intervention. Participants completed a pre-intervention online survey to identify comfort with performing and teaching AFOI. Following a 25-minute didactic session reviewing the indications and logistics of the procedure, participants practiced the procedure and attempted to teach the procedure to their colleague. An institutionally approved checklist for AFOI was used to assess participants. A two-sample T test assuming unequal variance was used to compare self-perceived efficacy before and after the peer-coaching intervention.

Results: A total of 15 faculty participated in the study. All participants showed ability to perform AFOI by successful completion of the procedural checklist's ten critical actions (15/15, 100%). There was a significant increase of self-perceived efficacy in performing ($p<0.01$, CI 1.34-3.06) and teaching AFOI ($p<0.01$, CI 1.56-3.05). All participants felt more likely to attempt AFOI after a single peer coaching session and most were more likely to teach AFOI (14/15, 93.3%). Participants identified peer-coaching as more effective at instilling confidence to perform and teach this skill compared to other CME activities they have experienced.

Conclusions: This study demonstrates peer-coaching as an attractive modality to increase faculty ability to perform and teach low-frequency, high-complexity procedures.

48 Preparing Students for Uncertainty in Clinical Practice: Recommendations for Emergency Medicine Clerkships

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Learning Objectives: To provide pedagogical recommendations for emergency medicine clerkship design that better prepares medical students for uncertainty in clinical practice.

Background: EM is replete with situations of uncertainty in clinical practice. How can EM clerkships then better prepare students for the clinical uncertainty that lies ahead?

Objectives: We sought to: 1) describe perceived comfort with uncertainty encountered across clerkships; 2) identify curricular elements that best prepares students for these situations. We hypothesize certain training components will correlate with clinical uncertainty comfort and themes will emerge to guide clerkship design.

Methods: This is an observational cross-sectional study of 289 students in an urban medical school surveyed following core clerkships (including EM). Items included Self-Efficacy (SE), Intolerance to Uncertainty (IUS), rating of perceived adaptive traits related to clinical uncertainty, and ratings of training components for preparation.

Spearman's correlation coefficient, Chi-Square, and ANOVA were used to assess GSE, IUS, clinical, and curricular items. Open responses were analyzed by authors to

generate themes using Braun and Clarke's 6-Step Framework.

Results: Table 1 highlights curricular elements that had a statistically-significant relationship with students' perception of their preparation, communication, relationships, and well-being related to clinical uncertainty. Qualitatively, students appreciated emotional vulnerability from teachers, storytelling, communication strategies, role-modeling, debriefing, and simulations (Table 2). SE positively and IUS inversely correlated with adaptive trait items ($p<0.05$).

Conclusion: Strategically immersing specific educational formats into an EM clerkship may help cultivate skills needed to adapt to uncertainty in clinical practice. Clinical debriefs, interprofessional role plays, simulations, communication skills sessions, discussions of emotional vulnerability, storytelling, and peer-to-peer conversations may have the most impact. Further study is required to evaluate these recommendations.

Table 1. Correlations between uncertainty elements and educational programs.

Clerkship Uncertainty Element	Educational Programs with Correlations to Uncertainty Element Ratings
Preparation	▪ Clinical Team Debriefs (p=0.04) ▪ Interprofessional Clinical Role Playing (p=0.02) ▪ Case-Based Learning (p=0.03)
Patient Communication	▪ Talking about my experiences with others (p=0.03) ▪ Clinical Story Slams (p=0.03) ▪ Required Scholarly Activity (p=0.03)
Patient Relationship Building	▪ Clinical Team Debriefs (p=0.01) ▪ Small-Group Communication Skills Practice (p=0.02)
Well-Being	▪ Small-Group Communication Skills Practice (p=0.02) ▪ Team-Based Problem-Solving Lectures (p=0.02) ▪ Writing Reflections and Narratives (p=0.04)

Table 2. Themes and examples for improving clinical uncertainty education (open responses)

Theme	Example Comments	# of Comments
Experience	▪ Being in the clinic and facing problems directly is the only way.	43
Reflections	▪ It's okay [for attendings] to have emotions and talk about those emotions, it's okay to have a bad day, it's okay to acknowledge when you are stressed. ▪ I think it is super helpful to work in a team where people say out loud that there are uncertainties and address how that makes them feel.	34
Simulations	▪ Simulations! Loved having throughout my education. ▪ Standardized patient encounters, choose your own adventure style modules.	17
Small-Group Learning	▪ More clinical skills small group sessions about uncertain scenarios.	17
Debriefing	▪ My greatest benefit came with debriefing an actual event with the resident who stood alongside me.	16
Demonstrating Communication	▪ Seeing good examples of physicians explaining things to patients when they don't know exactly in a concrete way. ▪ Seeing good examples of physicians explaining things to patients when they don't know exactly in a concrete way and what they DO know and what they are going to do to work to figure it out.	11
Role Modeling	▪ Seniors who demonstrate how you can tolerate it successfully, show it is not a failure, reveal how to create relationships with patients while being uncertain.	14
Storytelling	▪ More stories from more professionals. ▪ I'm a big fan of the faculty sharing their stories with us.	10
Wellness Activities	▪ Students experience incredible distress when there is not a clear cut and dry answer and they likewise approach medicine from a strictly resume-padding approach (whatever gets them to honor and match into some surgical specialty, etc.). ▪ Less emphasis on exams, as they rot our brains and turn us into robots with canned empathy.	9

**126 students submitted free responses. Several responses covered multiple themes.*

49 Raising Bias Awareness in Students

Jennifer Carey, MD; Cassandra Mackey, MD; Meme Tran, MD

Learning Objectives: Biases by health care providers can lead to patient morbidity and mortality. The learning objective is to identify if students are prone to biases. This will serve as a guide to for curriculum development and implicit bias training.

Introduction: Biases in health care providers have harmful or negative consequences on patient care and safety. Educating medical students to identify and override biases may improve overall patient outcomes.

Objective: To assess student perception of ED case scenarios containing biases.

Methods: Design: Two case scenarios with a resident presenting mock patients to an attending were pre-recorded; each case containing biases (see key points below). Participants: Fourth year medical students enrolled in an EM clerkship, 22 total participants. Students viewed cases and answered questions regarding diagnosis, management and treatment delays. Intervention: After answers were submitted there was a discussion on implicit bias. Students then reviewed the cases and answered questions again. Descriptive data comparing students' responses are shown.

Case 1. Aortic dissection in black male with chest pain. EMS suspected agitation from cocaine intoxication and drug seeking behavior. Anti-psychotics and benzodiazepines given in lieu of proper history and exam.

Case 2. Acute myocardial infarction in wealthy white male. EKG completed and resident at bedside within five minutes of arrival to a busy ED.

Results: A majority of students (91%) responded that substance abuse was the most likely diagnosis in Case 1 (Table 1). Post-intervention, this decreased to 50%. Delay in diagnosis responses are shown in Table 2. 23% of students felt there was no delay in care in Case 1, while 50% of students felt that there was a delay in Case 2. Comparison of pre- and post-intervention in Case 1 shows an increase to 68% of students reporting a delay in care.

Discussion: We observed that students were prone to bias, as seen by initial failure to recognize the diagnosis or delay in care in Case 1, as compared to post-intervention responses.

Conclusion: Creating an implicit bias curriculum may raise student awareness, improve patient care, and thereby prevent morbidity and mortality.

50 Resident Views on the Importance of Promoting Diversity and Inclusion

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Learning Objectives: Describe how EM residents rate the importance of promoting diversity and inclusion in EM education and whether residents from underrepresented groups feel differently than those who are not in underrepresented groups

Background: Promoting diversity and inclusion (D&I) in EM resident education has been identified as an important issue by the ACGME. It is unclear whether the EM residents themselves place a similar importance.

Objective: We sought to determine how important promoting D&I was to EM residents and whether residents who were members of ("UR") groups had different views than those who were not UR.

Methods: EM residents from six sites were surveyed using Google Forms. Responses had no identifiers. Using a 5-point Likert scale (0-Not Important / Definitely Not to 5-Very Important / Definitely), residents were asked about their views on promoting D&I. Specifically, they were asked "How big an issue is D&I in EM?" and how much they agreed with these statements: "EM resident training needs to incorporate more D&I education," "EM residencies should have different standards for applicants with different backgrounds", and "EM residencies need to work harder to recruit more diverse residents." Residents were asked whether they identify as a member of an UR group. Overall scores for each item were calculated. Differences between the responses of UR residents and non-UR residents were calculated.

Results: 96 residents completed the survey. Residents rated the importance of D&I 4.2 (95%CI 3.9-4.4), the need for more D&I education 3.9 (95%CI 3.6-4.1), the use of different standards for some groups 2.7 (95%CI 2.4-3.0), and need to work harder in recruiting 3.6 (95%CI 3.3-3.8). When compared to those not in UR groups, those in UR groups were more likely to rate the need for more D&I education higher (4.2 vs 3.6, Difference 0.5, 95%CI -1.0 to -0.0). There were no statistically significant differences between the ratings in the other questions.

Conclusion: As expected, residents believe strongly in the importance of promoting D&I in EM resident education. Other than a need for more D&I education, there were no differences in the views of UR residents and non-UR residents.

51 Simulation Based Mastery Learning Improves Use of Personal Protective Equipment by Medical Students

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Learning Objectives: The objective of this study is to determine if simulation based mastery learning (SBML) improves proper personal protective equipment (PPE) donning and doffing by medical students.

Background: Medical students lack adequate training on how to correctly don and doff personal protective equipment (PPE). Simulation-based mastery learning (SBML) is an effective technique for procedural education.

Objective: The objective of this study is to determine if SBML improves proper PPE donning and doffing by medical students.

Methods: This was a prospective, pretest-post-test study of 155 medical students at one university-based teaching hospital on demonstration of correct PPE use before and after a SBML intervention from July-December 2020. Eligible subjects included preclinical second-year students enrolled in a Practice of Medicine (POM) course and students completing a required emergency medicine (EM) clinical clerkship. Subjects viewed a CDC training video on proper PPE use prior to the intervention. They then participated in a SBML training session that included baseline testing, deliberate practice with expert feedback, and post-testing until mastery was achieved. Students were assessed using a previously developed 21-item checklist on donning and doffing PPE with a minim um passing standard (MPS) of 21/21 items. Differences between pretest and post-test scores were analyzed using paired t-tests. Students at preclinical and clinical levels of training were compared with an independent t-test.

Results: Two participants (1.3%) met the MPS on pretest. Of the remaining 153 subjects who participated in the intervention, 151 (98.7%) reached mastery. Comparison of mean scores from pretest to final post-test significantly improved from an average raw score of 12.55/21 (standard deviation [SD] = 2.86), to 21/21(SD = 0), $t(150) = 36.3$, $p<0.001$. There was no difference between pretest scores of preclinical and clinical students.

Conclusion: SBML improves medical student competence in PPE donning and doffing in a simulated environment. This approach standardizes PPE training for students in advance of clinical experiences.

52 Slack Intern Curriculum Supports Intern Preparedness and Bridges Curriculum Gaps due to COVID-19 Pandemic

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Learning Objectives: Assess the effectiveness of social media implementation of an Accreditation Council for Graduate Medical Education (ACGME) milestone-based curriculum during the spring 2020 US COVID-19 surge. The hypothesis is that pre-interns will report improvements in PP regarding multiple ACGME milestone topics.

Background: Transitioning to residency involves translation of academic knowledge into clinical acumen, and is complicated by variable medical school experiences. The COVID-19 pandemic presented a new challenge by displacing students from clinical rotations. Virtual educational modalities such as the Slack Intern Curriculum (SIC) have increased newly-matched "pre-intern" perceived preparedness (PP) for residency in prior years, but the SIC had never been implemented or evaluated in a pandemic with disrupted medical education.

Objective: Assess the effectiveness of social media implementation of an Accreditation Council for Graduate Medical Education (ACGME) milestone-based curriculum during the spring 2020 U.S. COVID-19 surge. The hypothesis is that pre-interns will report improvements in PP regarding multiple ACGME milestone topics.

Methods: The SIC was constructed using topics from 8 ACGME milestones in emergency medicine (EM), incorporated into 8 clinical scenarios. Residency recruitment occurred via national EM listservs; of 276 programs, 27 enrolled. Curricular implementation was on Slack workspaces. Cases included stimulus images and clinical questions. Ample discussion time, answers, and resources were provided. Trends in PP were calculated with descriptive statistics and the Wilcoxon Rank Sum test.

Results: Of 311 total pre-interns contacted, 289 (92.9%) completed a presurvey in April/May 2020, and 240 (77.2%) completed a post-survey in June/July 2020, for an 83.9% follow-through rate. Pre-interns reported statistically significant increases in PP both overall and regarding 14 of 21 milestones. See Table 1.

Conclusions: Amidst the educational disruption of the COVID-19 pandemic, pre-interns participating in the SIC reported statistically significant increases in PP. Limitations include absence of control or pre-pandemic data. Future directions include adapting the SIC to other specialties' ACGME milestones for generalizability across all fields.

Table 1. Wilcoxon Rank Sum Test smmary data on perceived preparedness of United States emergency medicine-bound pre-interns. Pre-crriculum surveys were completed in April/May of 2020, and post-currriculum were completed in June/July 2020.

Milestone	Level	Pre-Survey		Post-Survey		Comparison	
		Med	Mean (SD)	Med	Mean (SD)	95% CI[a]	*P* value[b]
Emergency Stabilization	Recognizing Abnormal Vitals	4	4.343 (0.695)	4	4.271 (0.736)	(-0.1948, 0.0514)	.28
	Recognizing an Unstable Patient	4	3.948 (0.787)	4	4.071 (0.659)	(-0.0007, 0.2462)	.13
Diagnosis	Forming a Diagnostic Plan	4	3.516 (0.838)	4	3.679 (0.738)	(0.0289, 0.2983)	.03
	Forming a Differential Diagnosis	4	3.574 (0.851)	4	3.708 (0.807)	(-0.0080, 0.2759)	.07
Diagnostic Studies	Identifying Need for Diagnostic Tests	4	3.433 (0.797)	4	3.562 (0.757)	(-0.0031, 0.2630)	.07
	Identifying the Appropriate Tests	4	3.412 (0.799)	4	3.525 (0.781)	(-0.0222, 0.2487)	.09
	Interpreting Test Results	4	3.343 (0.915)	4	3.45 (0.832)	(-0.0419, 0.2568)	.32
Pharmaco-therapy	Recognizing Pharmacology of Medications	3	3.059 (1.007)	3	3.142 (0.917)	(-0.0817, 0.2474)	.30
	Selecting Appropriate Medications	3	2.865 (0.935)	3	3.108 (0.904)	(0.0858, 0.4008)	.002
Disposition	Recognizing need for Additional Resources	3	3.215 (0.966)	4	3.408 (0.919)	(0.0324, 0.3552)	.01
	Recognizing need for Admission to Hospital	3	3.118 (0.878)	4	3.425 (0.845)	(0.1598, 0.4549)	<.001
	Recognizing Appropriate Level of Care for Admission	3	2.837 (0.892)	3	3.267 (0.944)	(0.2713, 0.5873)	<.001
General Approach to Procedures	Recognizing Relevant Anatomy for a Procedure	3	2.983 (1.029)	3	3.179 (0.979)	(0.0245, 0.3684)	.02
	Identifying Indications/Contraindications for Procedures	3	2.879 (0.970)	3	3.167 (0.967)	(0.1217, 0.4539)	<.001
	Identifying Appropriate Equipment for Procedures	3	2.668 (0.979)	3	3.062 (0.960)	(0.2285, 0.5608)	<.001
Airway Management	Identifying Pharmacology of RSI Medications	3	2.664 (0.997)	3	3.150 (1.003)	(0.3140, 0.6573)	<.001
	Confirming Endotracheal Tube Placement	4	3.502 (1.004)	4	3.867 (0.828)	(0.2085, 0.5214)	<.001
	Recognizing Upper Airway Anatomy	3	3.076 (1.068)	3	3.283 (0.999)	(0.0303, 0.3841)	.03
Other Diagnostic and Therapeutic Procedures	Recognizing Indications for Ultrasound	4	3.519 (0.902)	4	3.804 (0.807)	(0.1391, 0.4312)	<.001
	Optimizing US Images	3	2.661 (1.165)	3	2.950 (1.108)	(0.0945, 0.4837)	.003
	Interpreting US Images	3	2.799 (1.087)	3	3.154 (1.001)	(0.1763, 0.5334)	<.001
Overall Perceived Preparedness for Residency		3	3.107 (0.861)	3	3.350 (0.835)	(0.0974, 0.3881)	<.001

[a]Confidence interval vales reflect shift in location centered around changes in the mean.
[b]Bold type indicateds statistical significance
MED, median; *SD,* standard deviation; *CI,* confidence interval; *RSI* rapid sequence intubation; *US,* ultrasound.

53 SleepBudsTM Improve Reported Sleep and Decrease Tension in Health Care Shift Workers: A Prospective, Single-Subject Design Study

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Learning Objectives: Resident physicians often participate in shift work during training. Here, we aimed to develop a reproducible method for assessing perceived sleep quality, daily tension, and alertness in health care shift workers. In doing so, we assess the effect of the use of Bose SleepBudsTM on these parameters.

Background: Shift work triggers sleep disorders which impair performance and lead to physical and mental health disease. In health care workers, this decreases provider wellness and can compromise patient care.

Objectives: We predict use of Bose SleepBudsTM can improve sleep quality, sleepiness, and stress level in health care shift workers, and increase alertness and reaction time post-night shift.

Methods: Emergency medicine resident physicians were recruited for a prospective, single-subject design study. Entrance surveys on current sleep habits were completed. For 14 days participants completed daily surveys on sleep aid use, and rated perceived sleepiness, tension level, and last nights' sleep quality on an 8-point Likert scale. Post-overnight shifts, 3-minute psychomotor vigilance tests (PVT) measuring alertness and reaction time were completed. Participants were then provided Bose SleepBudsTM and used them as needed for sleep. Daily sleep surveys and post-overnight shift PVT continued for 14 days. Comparative statistics analyzed pre- and post-SleepBudsTM outcomes with participants serving as their own controls.

Results: 36 residents were recruited, of these 26 completed all tasks and were included in final analysis. During intervention period, last nights' sleep quality increased by 0.51 points ($p<0.0001$, 95% CI 0.226-0.797), daily sleepiness decreased by 0.62 points ($p<0.0001$, 95% CI -0.903 to -0.338), and total daily tension decreased by 0.56 points ($p<0.0001$, 95% CI -0.805 to -0.322). This effect was exaggerated in participants reporting below-median scores pre-intervention. 12 PVT tests were completed. Due to resident scheduling, insufficient PVT were performed to draw conclusions from this data.

Conclusions: Interventions such as SleepBudsTM may improve daily sleepiness, tension, and perceived sleep quality in health care shift workers. Larger studies are needed to determine this interventions' effect on alertness, reaction time, and patient outcomes.

54 Social EM in the Time of Covid: A Virtual Clerkship Experience

Natasha Wheaton, MD; Stephen Villa, MD; Andrew Grock, MD; Hannah Janeway, MD; Kian Preston-Suni, MD, MPH

Learning Objectives: We sought to explore students' previous exposure to social emergency medicine (EM), as well as to establish the feasibility of a virtual social EM curriculum embedded into a 2-week virtual advanced EM clerkship experience.

Background: Social and structural determinants of health are an under-appreciated but critical component of effective healthcare, particularly in the Emergency Department. With the Covid-19 pandemic limiting in-person learning, an innovative virtual curriculum was needed.

Objectives: We sought to explore students' previous exposure to social EM, as well as establish the feasibility of a virtual social EM curriculum.

Methods: The social EM virtual curriculum was included as part of two separate 2-week virtual clerkships beginning on 8/24/2020 and 9/21/2020 that recruited students interested in social EM and health equity. It consisted of small-group teaching using standardized modules created by our International and Domestic Health Equity and Leadership (IDHEAL) section. An anonymous mixed methods survey was distributed after each module. This observational study was conducted at a large academic center with a social EM fellowship.

Results: Session 1 and 2 had 9 and 17 students respectively. Of 130 distributed surveys, 75.4% were completed. Previous social EM experience varied between topics, with race being the most commonly reviewed (68.8%) and incarceration the least (5.5%) (Figure 1). 98.9% of respondents agreed/strongly agreed that these social EM topics are important for the care of ED patients and 94.9% felt more confident addressing these topics with patients in the ED after the session (Figure 2). Additionally, 96% of students agreed/strongly agreed that the virtual clerkship should be repeated even if Covid restrictions are lifted.

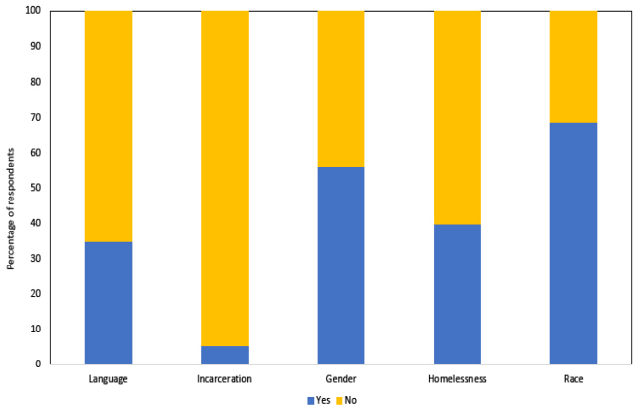

Figure 1. Have you ever had formal instruction on the topic discussed.

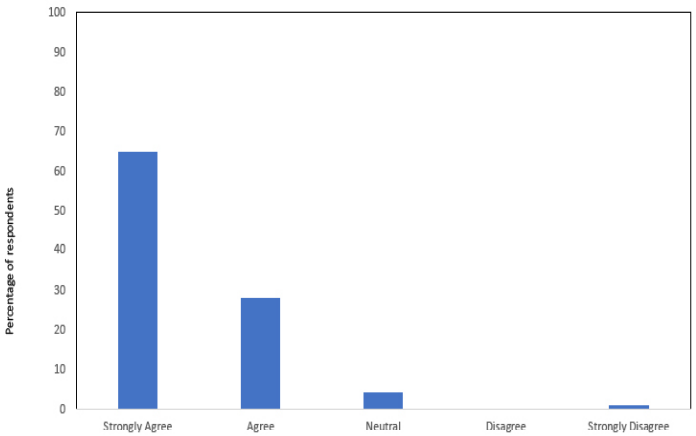

Figure 2. I feel more confident about how to address this topic when seeing patients in the emergency department.

Conclusions: We established the feasibility of a virtual social EM curriculum using standardized modules and show evidence supporting the use of virtual learning. This curriculum's impact is increased by the virtual platform's ability to provide a more diverse group of students and easier access to content experts. Finally, the use of standardized modules enables other programs to easily reproduce our curriculum.

55 Social Stressors and Isolation Have Biggest Effect on Resident Wellness During a Pandemic

Brian Walsh; Sarah Bella, DO; frederick fiesseler, DO; Kristen Walsh, MD; Ashley Flannery, DO; Brian Walsh, MD

Learning Objectives: To identify what features of the Covid-19 pandemic have the biggest negative impact on the wellness of EM residents and what interventions help the most.

Background: EM physicians are already known to be high-risk for depression and burnout. In all likelihood the Covid-19 pandemic has added to this risk.

Objectives: We sought to identify the primary stressors for EM residents during this pandemic and determine which factors and interventions have helped most to improve their wellness.

Methods: Setting: An EM residency program in the state with the highest per-capita deaths from Covid-19. All EM residents were surveyed eight months into the pandemic using Google Forms. Surveys were anonymous to promote honesty. Residents were asked about to identify the three factors that had the greatest negative impact on their wellness. They were also asked to identify the three features that did most to improve wellness. Demographic information was collected.

Results: 23 of 27 residents (85%) completed the survey. 91% (95%CI 80-100) said the negative impact of the pandemic affects them more socially than professionally. The factors identified most commonly contributing negatively to a resident's wellness were "decreased socialization / isolation" (74%) and "concerns for family safety" (70%). "Changing hospital protocols" (35%), "Feeling under-appreciated at work" (30%), and "Public not doing enough to stop the spread" (30%) were also identified frequently as having a negative effect. "Concerns for my own safety" was only identified by 17% of residents as being a top-three issue. The features most commonly identified as helping wellness were "Ability to socialize in small groups" (65%), "team mentality" (57%) and "free food" (44%).

Conclusion: Overwhelmingly, residents cite the social impact of the pandemic as having a more negative effect on their wellness than work did. Concerns for their own safety are not identified frequently as having a significant impact. Interventions that are social and decrease the sense of isolation appear to be especially important in improving wellness.

56 Society of Academic Emergency Medicine Systematic Online Academic Resource Review: Endocrine, Metabolism, and Nutrition

Jonie Hsiao, MD; Ryan Pedigo, MD; Whi Inh Shirley Bae, MD Candidate; JooYeon Jung, MD Candidate; Lisa Zhao, MD; N. Seth Trueger, MD, MPH; Teresa Chan, MD, MHPE; Andrew Grock, MD

Learning Objectives: To identify and present a list of high-quality FOAM resources related to EM and specific to endocrine, metabolic and nutritional disorders to guide trainees, educators and FOAM creators.

Background: Free open access medical education (FOAM) has become an integral part of medical school and residency training. However, resources potentially lack quality and coverage of core topics may not be comprehensive.

Objectives: In this second entry of the SAEM Systematic Online Academic Resource (SOAR) series, we describe the application of a systematic methodology to identify, curate, and describe FOAM content specific to endocrine, metabolic and nutritional disorders as defined by the 2016 Model of the Clinical Practice of EM (MCPEM).

Methods: We developed an automated algorithm to search 264 keywords derived from 9 subtopics within the MCPEM category in Google Foam and each site listed in the Social Media index. The top 100 results for each keyword were extracted. Resources underwent a manual iterative screening process. Those relevant to endocrinology and EM were evaluated with the revised Medical Education Translational Resources: Impact and Quality (rMETRIQ) tool.

Results: After rater training among four reviewers, the average measures intraclass correlation coefficient was 0.94 (95% CI 0.88-0.97, $p<0.001$), denoting a very strong interrater reliability. Eliminating duplicates and journal articles from the initial 36,259 resources resulted in 9,751 posts, of which the preliminary screen for EM and endocrinology relevance

narrowed the total to 1,159 resources. Full-text review of 867 of these resources identified 486 that met our inclusion criteria and underwent evaluation with the rMETRIQ tool. Topic distribution was uneven (Figure 1). Table 1 outlines the subtopic distribution of total posts and high-quality posts with rMETRIQ scores ≥ 16.

Conclusions: We systematically identified, described, and curated FOAM resources for EM residents and medical students on the topic of endocrinology, metabolic and nutritional disorders. A final list of high-quality resources can guide trainees, educator recommendations, and FOAM authors.

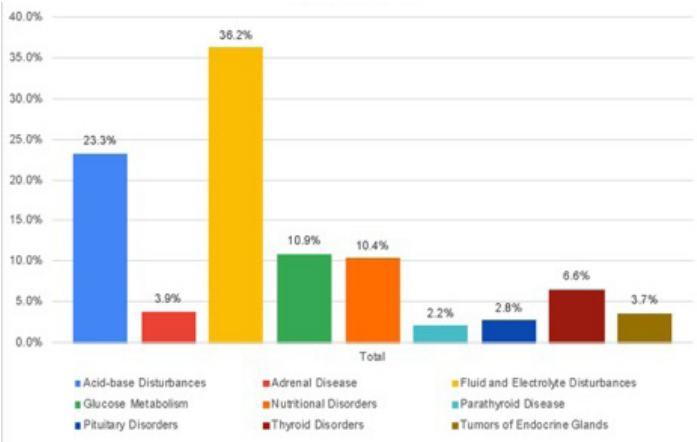

Figure 1. Topic distribution.

Table 1.

Subtopic	Total Posts	High-Quality Posts rMETRIQ ≥ 16
Acid-base Disturbances	181	*
Parathyroid Disease	110	7
Potassium	73	12
Fluid and Electrolyte Disturbances	59	*
Sodium	41	5
Thyroid Disorders	40	*
Nutritional Disorders	34	2
Vitamin deficiencies	28	1
Hypoglycemia	27	1
Hypovolemia	24	3
Diabetic Ketoacidosis	20	6
Pituitary Disorders	16	3
Tumors of Endocrine Glands	15	1*
Corticoadrenal insufficiency	14	1
Thiamine	14	5
Calcium	13	0
Magnesium	11	2
Chloride and Phosphorous	10	0
Hyperosmolar Hyperglycemic State	8	3
Hyperglycemia	6	0
Hyperthyroid	5	1
Hypothyroid	5	1
Malnutrition	5	0
Pituitary	4	3
Adrenal Disorders	4	1
DM Type 2	3	6
Fluid overload	3	0
Cushing's Syndrome	2	2
Malabsorption	1	0
Glucose Metabolism	1	*
Insulin pump	1	1
Total	778	81

*Number of posts pending secondary review and rMETRIQ scoring by topic: Acid-Base Disturbances (180), Fluid and Electrolytes (59), Glucose Metabolism (1), Thyroid Disorders (39), Tumors of Endocrine Glands (13)

57 The Effect of Simulated Patient Death on Participants' Self-Confidence

Devonne Harris, BA; Hilary Fairbrother, MD, MPH

Learning Objectives: The learning objectives include determining how a case with and without simulated patient death impacts participants' confidence and, secondarily, how the order of these simulation cases affect participants' confidence.

INTRODUCTION: The psychosocial effects of high-fidelity simulation are often neglected in studies. To the best of our knowledge, few studies have investigated if participants' self-confidence is significantly altered by simulated patient mortality.

OBJECTIVES: The aim of this project is to determine if participants' self-confidence in high fidelity simulation cases is affected by simulated patient death. It is also important for us to determine if the order of simulated patient outcomes may alter the participants' self-confidence.

METHODS: This is a prospective observational study including medical students participating in a third-year emergency medicine elective at a large academic institution. Students were randomly divided into two groups and each group completed the same two simulation cases. Group A completed a case with simulated patient death (case 1) first followed by a case in which the patient does not die (case 2). Group B completed the cases in the reverse order. After each case, students completed an anonymous survey of their self-confidence based on a validated confidence scale.

RESULTS: There were 15 participants in this study. The self-confidence scale (C-scale) could range from 5 (low self-confidence) to 25 (high self-confidence). The mean C-scale for case 1 and case 2 were 14.4 and 15.3, respectively ($p>0.05$). The mean C-scale for group A ($n=9$) and group B ($n=6$) were 12.9 and 17.7, respectively ($p<0.05$).

CONCLUSIONS: There was no statistical difference between the C-scales reported in case 1 and 2 which suggests that simulated patient death does not directly impact a learner's self-confidence. However, a relationship between the order of the cases and self-confidence appears to exist. Learners who first completed the case without death were overall more confident than their counterparts who first completed the case with death.

58 The Feasibility of the Vot-ER Voter Registration Model in a Public Hospital Emergency Department

Jennifer Lee, MD; Larissa Unruh, MD; Ameera Haamid, MD; Ashlea Winfield, MD; Errick Christian, MA; Rashid Kysia, MD, MPH; Pilar Guerrero, MD

Learning Objectives: The learning objective is to understand the implementation and feasibility of a novel (and

popular) voter registration platform in a busy public hospital emergency department serving underrepresented patients.

Background: Historically, there have been low levels of voter registration amongst impoverished and minority citizens. Due to societal constructs, these patients are overrepresented in public hospitals. In the 2016 Presidential election, only 62.4% of Illinois eligible voters were registered1 despite policy having a direct impact on healthcare.

Objectives: To evaluate the feasibility of a voter registration system in a public hospital emergency department (ED).

Methods: A prospective observational description of the implementation and feasibility of voter registration using the Vot-ER platform was done in a large, municipal urban ED. Vot-ER is a national nonpartisan initiative developed for ED voter registration2. We implemented it from August to October 2020. A proposal was approved by hospital administration and respective stakeholders after an extensive legal review that took 7 weeks due to institutional ordinances at the hospital. A training module was presented at residency conference and distributed to all ED providers. Registration posters from Vot-ER were posted in the ED. We distributed electronic QR codes printed on badges for clinicians. Patients were offered voter registration by clinicians in English and Spanish via Vot-ER who tallied online registration.

Results: Voter registration was initiated by 51 patients. Patients without cell phone data access to register on site were given a website link.

Discussion: This platform provided an easy and quick way to register patients at a public hospital. Considering the limited resources required, brief training, and number of patients who initiated registration we feel that a public hospital ED is a feasible location to connect underrepresented patients to voter registration. Given the impact of policy on healthcare, providing underrepresented patients an opportunity to register should be a social emergency medicine priority.

59 The Impact of Sleep on In-Training Examination Scores among Emergency Medicine Residents

Kristin Weeks, MD; Michael Takacs, MD, MPH; Christian DeFazio, MD; Joelle Borhart, MD

Learning Objectives: understand the impact hours of sleep the night before the In-Training Examination (ITE) has on examination scores and consider possible interventions to resident work schedules leading up to the ITE

Background: Sleep deprivation is a fundamental challenge of shift work and has been shown to impact emergency medicine physician-residents' performance and coordination. It is not known if sleep deprivation impacts performance on the in-training emergency medicine examination (ITE). We hypothesize that more sleep the night prior to the examination is associated with higher examination scores.

Methods: We administered a cross-sectional 12-question electronic survey to physician-residents in emergency medicine residency programs in the United States in April 2020. Our sampling frame was residents of program directors (N=366) receiving the Council of Residency Directors in Emergency Medicine (CORD) listserv. We constructed a multivariable logistic regression model of scoring at least 70% on the ITE by hours of quality sleep the night before the examination.

Results: 286 (90%) respondents who completed the survey reported hours of sleep and were included in the analysis. Independently of sex, year in residency, rotation and hours off clinical duties before the examination, each additional hour of sleep (range <1 to 9 hours) received the night prior to the ITE was associated with 1.25 greater odds (95% confidence interval (CI) 1.01-1.55) of scoring greater than 70% on the examination. The adjusted odds of scoring greater than 70% on the ITE were 7.22 times (95% CI 2.85-18.27) greater for third- and fourth-year residents (versus first and second) and 3.26 times greater (95% CI 1.02-10.43) for residents who had been off-service for 19-24 hours prior to the examination (versus 0-6).

Conclusion: Increased hours of sleep were significantly associated with higher ITE scores. Attention should be given to shift work prior to the ITE, and physician-residents should be given time-off clinical duties the night prior to the ITE to allow for greater hours of sleep. Residents should be educated about fatigue mitigation and the importance of maximizing sleep off-duty.

60 The Landscape of Pediatric Training in Emergency Medicine Residencies

jillian Nickerson, MD, MS; Aditi Ghatak-Roy, MD; Katie Donnelly, MD, MPH; Xian Zhao, MD, MEd

Learning Objectives: 1) To describe the landscape of pediatric training in EM residencies; and 2) to evaluate the confidence Program Directors (PDs) have in their graduating trainees' ability to care for pediatric patients.

Background: Several studies have demonstrated that Emergency Medicine (EM) providers are uncomfortable caring for pediatric patients relative to caring for adult patients. Pediatric training in EM residents has not been evaluated since 2000.

Objectives: 1) To describe the landscape of pediatric training in EM residencies; and 2) to evaluate the confidence Program Directors (PDs) have in their graduating trainees' ability to care for pediatric patients.

Methods: We conducted a survey study of EM PDs. PDs were identified from the American Medical Association

residency database. Two follow-up emails were sent over 3 weeks if no response was received. We collected information on program demographics, rotations, and didactic methods. We measured PDs' confidence of graduating residents' competence.

Results: We found email addresses for 249 (93%) of the 268 EM programs, of whom 119 (48%) PDs completed the survey. Of these, 79% (92) are 3-year programs with a median of 32 (IQR 24-42) residents from 33 states.

Almost half (57, 42%) of programs had no department of Pediatric Emergency Medicine (PEM) at their institution. PDs mostly reported that pediatric patients made up 10-20% (68, 59%) or 20-30% (33, 28%) of the overall patients seen by residents. In terms of rotations: 91% (110) require a PEM rotation, less than half (47, 43%) at a freestanding children's hospital; 83% (88) require PICU; and only 29% (34) require NICU.

The majority of curricula (70, 62%) are designed by PEM trained faculty, 85% (96) have PEM attendings teach lectures, and most (77, 68%) report that 10-20% of didactic time is spent on pediatrics topics.

PDs were less confident in their graduating residents' competence in the care of pediatric patients as compared to adult patients (Table 1).

Conclusions: There remains heterogeneity in pediatric training for EM residents. PDs are less confident in their graduating residents' competency to care for pediatric compared to adult patients.

Table 1. Comparison program director's confidence in their graduating resident's pediatric versus adult skills.

		Number (percent) Program Directors confident that ALL residents graduate with competency in this skill	Number (percent) Program Directors confident that fewer than all residents graduate with competency in this skill	p-value
Resuscitation skills	Neonatal	41 (42%)	57 (58%)	<0.0001
	Pediatric	77 (77%)	23 (23%)	
	Adult	99 (98%)	2 (2%)	
Trauma	Pediatric	79 (78%)	22 (22%)	<0.0001
	Adult	99 (98%)	2 (2%)	
Intubation	Pediatric	61 (62%)	37 (38%)	<0.0001
	Adult	101 (100%)	0 (0%)	
Venous access	Pediatric	40 (41%)	58 (59%)	<0.0001
	Adult	98 (98%)	2 (2%)	
Lumbar puncture	Pediatric	73 (73%)	27 (27%)	0.0009
	Adult	92 (91%)	9 (9%)	
Ultrasound	Pediatric	62 (62%)	38 (38%)	<0.0001
	Adult	100 (99%)	1 (1%)	
Urgent care	Pediatric	76 (79%)	20 (21%)	0.12

61 The Prevalence of Lesbian, Gay, Bisexual, and Transgender Health Education and Training in Emergency Medicine Residency Programs: Where are we now?

Joel Moll, MD; David Vennard, DO; Rachel Noto, MD; Timothy Moran, PhD; Paul Krieger, MD; Lisa Moreno-Walton, MD, MS, MSCR; Sheryl Heron, MD MPH

Learning Objectives: Our primary objective was if EM residencies offer education on sexual minority health. Secondary objectives include the number of actual hours versus desired, identification of barriers, and correlation of education with program demographics. Finally we compared with survey results from 2013.

Background: Despite inequities and disparities in Lesbian, Gay, Bisexual, Transgender, Queer (LGBTQ+) health, little education occurs in medical school or residency for emergency physicians. With increased focus on health inequities and disparities, and efforts of many organizations to provide education, we sought to reexamine the status of sexual minority health education in emergency medicine (EM) residencies.

Objectives: Our primary objective was to determine if EM residencies offer education on sexual minority health. Secondary objectives include the number of hours vs desired, identification of barriers, and correlation with program demographics. Finally, we compared our current data with past results of our 2014 study.

Methods: An identical survey to the 2014 study examining LGBTQ+ training was sent via email to EM accredited programs who had at least a class of residents.

Results: A total of 209 programs were identified, with a 54% response rate. The majority (75%) offered education content on LGBTQ+ health, for a median of 2 hours (IQR: 1 – 3) and a range of 0 to 22 hours. Respondents desired more education than offered (Median = 4, IQR: 2 – 5; $p<0.001$). The largest barrier identified was lack of time in curriculum (63%). The majority of programs had LGBTQ+ faculty and residents. Inclusion and hours positively correlated with presence of LGBTQ+ faculty or residents, University and county programs were more likely to deliver education than private groups ($p=0.03$). Awareness of LGBTQ+ resident but not faculty differed by region, but there was no significant difference in actual or desired content by region. Conclusion: The majority of EM training programs offer education in sexual minority health, although there remains a gap between actual and desired hours. This is a notable change since the original study demonstrating only 26% in 2014. Several barriers still exist, and the impact and completeness of education remain areas for further study

62 The Rise of Social Media to Connect With Emergency Medicine Residency Applicants During COVID-19

Cassidy Baldwin, BA; Anthony DeMarinis, BA; Nikhi Singh, BS; Charles Khoury, MD

Learning Objectives: Compare how emergency medicine residency programs are using various online platforms to engage and communicate with applicants during the 2020-2021 application cycle.

Background: The COVID-19 pandemic has profoundly impacted this year's residency application and match process. In-person interviews and the majority of visiting rotations have been suspended, impeding traditional avenues that applicants use to evaluate programs. Prior research suggests that emergency medicine residency programs have been using social media as a means of education, outreach, and discussion.

Objectives: The objective of this study is to evaluate how emergency medicine residency programs are using online platforms during the 2021 application cycle, specifically to publicize live virtual events showcasing their individual programs.

Methods: A standardized google search was used to find every EM program's website, Twitter, Instagram, and Facebook. The pages were further evaluated for virtual open house advertisements posted after March 2020, as well as for date of account creation.

Results: Emergency medicine has a large online presence with a total of 258 websites and 452 social media accounts across 260 programs. Nearly all programs (99%) have their own website. Many programs use Twitter (75%), Facebook (38%), or Instagram (61%), and 25% of programs have accounts on all three. Most Twitter and Facebook accounts were created before March 2020 (92% and 93%, respectively), whereas nearly half (44%) of Instagram accounts were created after the start of the COVID-19 pandemic. The majority of programs utilized their Twitter (69%) and Instagram (73%) to advertise virtual open houses; Facebook was used much less often (33%). Only 9% of programs advertised virtual opportunities on their website.

Conclusion: In a time of limited travel and social distancing, online platforms can facilitate virtual versions of interactions lost due to the pandemic. There is a clear preference for using social media over traditional websites to promote these networking opportunities. This bias is likely due to the dynamic, brief, and easily accessible nature of social media.

63 Uncompensated Academic Workload Negatively Correlates With Job Satisfaction Among Emergency Medicine Residency Faculty

Martha Barrett, MD; Jennifer Chapman, MD; Michael Hansen, DO; Meredith Thompson, MD; Bill Soares, MD; Christine Stehman, MD

Learning Objectives: To evaluate the effect of perceived uncompensated workload on the job satisfaction of EM residency faculty.

Background: Job satisfaction is vital to prevent burnout and attrition in emergency medicine (EM) residency faculty. Prior studies have split academic physician time into 4 domains: research, education, administration and clinical. Uncompensated work in non-clinical domains has been suggested to contribute to lower job satisfaction and higher rates of attrition.

Methods: A cross sectional survey was developed that evaluated perceived and actual contracted work hours by clinical and non-clinical domains, as well as job satisfaction, measured by the previously validated Global Job Satisfaction (GJS) (scale from -3 to +3) scale. It was piloted and edited for clarity by academic EM faculty not involved with the study. The survey was emailed to a cross sectional convenience sample of physician faculty at 49 EM residency programs across the US where the authors had personal contacts between 2/24/2020 and 4/20/2020. A one way ANOVA was used to compare groups.

Results: Out of 1791 surveys sent to EM faculty, 265 were completed. None were excluded and the response rate was 14.8%. Nearly half (43%) of respondents perceived that they are working more non-clinical hours than specified in their contract. Analysis of faculty with known contracted non-clinical hours who perceived that they were working more than contracted resulted in reduction in job satisfaction versus faculty who perceived they were at or below their number of hours ($p=0.03$, mean GJS 0.215 to 0.025/0.008).

Conclusions: Results show that perception of uncompensated non-clinical workload correlates with lower job satisfaction. With the importance of academic EM faculty retention, this study suggests that focus should be placed on non-clinical hours worked, since perceived uncompensated hours is associated with decreased job satisfaction.

64 Variable Shift Lengths Negatively Affect Emergency Medicine Resident Wellness

Joseph Longobardi, DO; Marcus Fazzari, DO; Joseph McCarthy, DO; Matthew Hysell, MD

Learning Objectives: We sought to examine the contributions of PGY year, shifts worked per month, patients seen per shift, and length of shifts to emergency medicine resident burnout.

Variable shift lengths negatively affect emergency medicine resident wellness

Background: Burnout is very common in emergency medicine and many factors may contribute to burnout, especially during residency training.

Objectives: We sought to examine the contributions of PGY year, shifts worked per month, patients seen per shift, and length of shifts to emergency medicine resident burnout.

Methods: All emergency medicine residents were surveyed with regards to their PGY year, shifts worked per month, patients seen per shift, and length of shifts. They were administered the Stanford Wellness Survey and asked to globally rate their degree of burnout. We then modeled whether consideration of the surveyed factors increased the predictability of the Stanford Wellness Survey to residents' self-assessment of burnout.

Results: Two hundred thirty-six residents completed the survey. The Stanford Wellness Survey indicated that while 93% of respondents met criteria for professional fulfillment, 59% were also at increased risk for burnout. PGY year, shifts worked per month, and patients seen per shift did not significantly contribute to burnout. The Stanford Wellness Survey by itself correctly predicted residents' degree of burnout 61% of the time. Incorporating shift length with the Stanford Wellness Survey did improve the model to 65%. Increasing from 8 to 10 hours ($p<0.05$) and 8 to 12 hours ($p<0.05$) increased burnout. Variable shift length had the highest odds of predicting burnout ($p<0.001$).

Conclusion: Longer shifts were associated with a higher chance of burnout. Variable shift lengths had the highest odds ratio of being associated with burnout.

65 Virtual Didactics Maintain Educational Engagement with Convenience

Megan Stobart-Gallagher, DO; Dimitrios Papanagnou, MD

Learning Objectives: We sought to investigate participants' satisfaction, engagement and motivation to participate in weekly virtual residency didactics and compare both the pre and post implementation average attendance for resident and faculty physicians in an Emergency medicine residency program.

Background: During the novel 2019 Coronavirus pandemic (COVID-19), social-distancing guidelines limited the ability for graduate medical education (GME) programs to continue their in-person weekly didactics. This not only threatened the ability to provide regularly-scheduled education, but also promoted social isolation at a time when many learners were vulnerable to both the clinical and personal challenges of living and working during a pandemic.

Objectives: We sought to investigate participants' satisfaction, engagement and motivation to participate in weekly virtual residency didactics and compare both the pre and post implementation average attendance for resident and faculty physicians in an Emergency medicine residency program.

Methods: Weekly didactic curriculum for EM residents was migrated to a synchronous, virtual format, leveraging Zoom Conferencing software. Sessions evolved from recycled core content content powerpoints to now incorporate gamification, active learning, and interdisciplinary pedagogies to remain authentic to our traditional live curriculum.

Results: An anonymous survey was sent to resident physicians (PGY1-3) and faculty, which resulted in a 48% and 26% response rate respectively. Resident and faculty attendance increased (69% to 80% and 19 to 23% respectively when averaged over 8 weeks pre/post implementation).The vast majority of residents were satisfied and motivated to attend with most feeling engaged or very engaged overall. Respondents were also able to give free text answers about feeling engaged, distanced, confused and how a virtual conference has been helpful. Underlying themes included wellness due to ease of accessibility, engagement in small groups, and surprise with ease of use and amount of interaction possible.

Conclusion: The authors posit that a virtual, weekly, synchronous conference curriculum is a convenient, engaging, and effective modality to both maintain resident social connectedness and provide educational

66 Voting is a Public Health Issue: An intervention to Address Trainee Voter Participation in State and Federal Elections

Katherine Joyce, MD, MPH; Emily Irvin, MD; Taher Vohra, MD; Sam Champagne, BA; Nikhil Goyal, MBBS

Learning Objectives: To determine the extent to which residents vote in national elections and design effective interventions to improve the same.

Background: There is no published data on voting rates (VT) of residents and fellows or barriers they may face, though practicing physicians vote less than the general public (GP). Residency programs and teaching hospitals may have opportunities to promote trainee civic engagement.

Objectives: To measure voter registration (VR) and VT for trainees, identify barriers, and determine interventions to improve VR and VT.

Methods: Trainees (n=869) at 3 Henry Ford Health System (HFHS) hospitals were surveyed in 2018 and 2020. They were

asked about VR status, if they voted recently and barriers to voting. Based on 2018 survey results, VR and absentee ballot request forms were provided to new trainees during 2020 orientation and two informational sessions were held. In 2020, VR and VT were compared to survey results from 2158 trainees at local hospitals who did not receive the intervention. Additional comparisons matched trainees to GP age/gender cohorts. Analysis used descriptive statistics, chi-square or Fisher's exact tests, and univariate analyses. Free-text responses were categorized into themes with iterative discussion.

Results: Response rate was 36% for HFHS trainees. VR and VT for trainees were higher than in the GP and were sustained when compared with age/gender matched cohorts (Table). Preliminary analyses of 2020 HFHS trainee data show VR and VT for primary and general elections increased over 2016 and 2018, with 91% voting in 2020 (Table). Forgetting to request absentee ballots and apathy were the most common barriers. Further 2020 analyses including non-HFHS trainees will be included in the final presentation.

Conclusions: Prior data suggest that VR and VT are higher for among trainees vs GP. Programs may be able to improve trainee civic participation by encouraging VR, absentee balloting and informational sessions. Limitations included a low response rate. Generalizability to other states may be limited due to unique voting regulations.

Table 1. Voter registration and voting rates among residents and fellows- 2016, 2018, 2019.

	2016 Election		2018 Election		2020 Election
	HFHS Trainees	General Population	HFHS Trainees	General Population	HFHS Trainees
Voter Registration Rate			91%	67%	98%
Voting Rate: Primary	53%[1]	26%	39%[1]	20%	56%
Voting Rate: General	79%[1,2]	61%	73%[1,2]	53%	91%

1: p<0.001 compared to general population. 2: p<0.001 compared to age-matched cohorts and to gender-matched cohorts in general population (national data not available for primary election)

67 Who Is On My Team?: A Qualitative Analysis of Physician Interpersonal Conflict at the Time of Admission From the Emergency Department

Caitlin Schrepel, MD; Ashley Amick, MD, MS; Maralyssa Bann, MD; Bjorn Watsjold, MD, MPH; Joshua Jauregui, MD; Jon Ilgen, MS, MCR; Stefanie Sebok-Syer, PhD

Learning Objectives: The goal of this study was to gain a more nuanced description of conflictual interpersonal interactions between physician colleagues in order to provide foundational guidance for how training communities can support best practices and curricular innovation regarding communication.

Background: Communication and teamwork are core competencies for Emergency Medicine (EM) physicians. Despite the use of structured hand-off tools, interpersonal interactions at the time of admitting a patient continue to be an underexplored source of workplace conflict. Objectives: The goal of this study was to gain a more nuanced description of conflictual interpersonal interactions between physician colleagues in order to provide foundational guidance for how training communities can support best practices and curricular innovation regarding communication.

Methods: Using constructivist grounded theory we explored the lived experience of physician-to-physician conflict among EM and internal medicine (IM) clinicians. Using purposive recruiting sampling, data were collected via hour-long, semi-structured interviews. A constant comparative and integrative analysis was used to refine our interview guide. All transcripts were double coded by the two primary investigators. Interviews were concluded after reaching thematic sufficiency.

Results: Eighteen participants described aspects of the learning environment and culture that promoted transformation of disagreement into conflict including interspeciality bias and dysfunctional team dynamics. Both EM and IM providers emphasized the role of word choice and communication practices in generating mutual feelings of judgment and disempowerment. They also described personal and professional consequences of conflict, such as burnout, low self esteem, and questioning their choice of specialty.

Conclusions: Interpersonal conflict is a pervasive issue that affects physician well-being. Normalization of bias and stereotyping is reinforced throughout training and is often modeled by supervising physicians, promoting a culture of interphysician "othering." Educators should specifically target interventions to improve interspecialty communication and mitigate the harm of these interactions.

Innovations Abstracts

1 A Just-in-Time Peer Driven Critical Care Curriculum for Emergency Medicine Residents in a COVID-19 "Hot Zone"

Kestrel Reopelle, MD; Duncan Grossman, DO; Timothy Soo, MD; Sally Bogoch, MD, MSEd; Arlene Chung, MD

Learning Objectives: After participating in this educational intervention, junior EM residents were able to discuss the basics of ventilator management and critical care pharmacology, as well as identify an approach to the deteriorating ventilated patient.

Abstract:

Background: The rapid rise of COVID-19 cases posed

a unique staffing challenge to residency programs. The addition of ICU assignments, particularly for junior residents who may not have had prior critical care exposure, led to the development of a just-in-time curriculum to address this training gap. Seniors residents, with ample and recent critical care experience, were in a unique position to provide education and guidance to junior learners.

Educational Objectives: After participating in this educational intervention, junior EM residents were able to discuss the basics of ventilator management and critical care pharmacology, as well as identify an approach to the deteriorating ventilated patient.

Curricular Design: Following Kern's six step approach (1) There was clear need due to the sheer volume of critically ill patients at our institution. (2) We developed areas of content focus through a needs-assessment directed at residents who had already begun managing critical COVID patients. (3) Objectives described above. (4) The curriculum included three lectures and three corresponding study guides for reference. The lectures were led by senior residents focused on creating a relaxed discussion-based learning environment. A critical care pharmacist collaborated on the module on sedative, paralytic, and vasopressor selection. (5) The curriculum was launched on April 10th and concluded April 23rd 2020. A virtual meeting platform was selected given the necessity of socially distant learning, and for ease of recording and re-distribution. (6) We will judge effectiveness with a knowledge based survey to measure understanding and retention.

Impact: 100% of interns attended at least one lecture. 13 of 16 interns provided feedback, giving an average rating of 4.77 (on a 5-point Likert scale) for how well the curriculum prepared them for the COVID ICU. We plan to administer a knowledge based survey 6-8 months post intervention, with completed results by CORD 2021.

2 A Longitudinal Curriculum in Social Emergency Medicine

David Warshaw, MD; Christianna Sim, MD, MPH; Adrian Aurrecoechea, MD, MPH; Kimberly Christophe, MD; Noah Berland, MD, MS; Naomi Rebollo, MD; Sophia Sharifali, MD; robert taylor surles, MD; scott kendall, MD; James Willis, MD

Learning Objectives: 1. Recognize some of the many socioeconomic factors which influence health.

2. Examine the role of the emergency department in population health.

3. Identify principles that can be applied from the bedside to a systems and population level to address health disparities.

Abstract:

Background: EM has begun to formalize education in social determinants of health (SDH) through the subspecialty of Social EM (SEM). Principles of SEM are inherent in EM, but incorporating SEM into a clinical curriculum is difficult. However, SEM is important, as studies have demonstrated a connection between SDH and health outcomes. ACGME guidelines state that residents must demonstrate awareness of the larger context of healthcare, including the SDH. However, many institutions face a dearth of formal education in these topics.

Educational Objectives: We set out to develop an SEM curriculum with the goal of teaching residents to recognize the socioeconomic factors that influence health, and to identify ways to address health disparities on a systems level.

Curricular Design: In our program's curriculum review, we identified the need for education in SDH. In the survey, 62% of respondents felt the residency did not provide adequate education in SEM and healthcare advocacy, with 92% reporting a desire to participate in activities related to healthcare advocacy after residency. The curriculum we developed is based on SocialEMpact and UCLA's IDHEAL program. A one-day introduction to SEM occurs during intern orientation. The rest of the curriculum consists of a lecture series delivered during weekly didactic conferences, covering topics such as race, housing status, and immigration. Resident lecture topics are chosen based on interest to ensure an engaging curriculum. The curriculum continues through electives and capstone projects, which have included electives in global healthcare delivery, rural EM, and correctional medicine.

Impact/Effectiveness: Our curriculum has had positive feedback, with residents stating interest in continued education. The formal didactic component has been well received and will continue indefinitely, with annual feedback surveys incorporated into future versions.

3 A Longitudinal Palliative Care Curriculum for Emergency Medicine Residents

Timothy Friedmann, MD; Joe-Ann Moser, MD, MS; Angela Chen, MD

Learning Objectives: This longitudinal conference-based curriculum is designed to provide EM residents with early, repeated exposure to palliative care skills applicable to their roles within the ED. Learners will be prepared to have difficult conversations with patients/families and to treat patients near end-of-life.

Abstract:

Background: A deliberate and compassionate goals of care discussion can impact our patients' courses at least as much as a seamless intubation, yet EM residents spend far less time practicing these difficult conversations. Palliative care in the ED is an essential and often uncomfortable topic for many providers. EM residency programs recognize the importance of palliative care skills and while over half report teaching these skills1, little has been published on specific palliative care curricula for EM residents.

Educational Objectives: This curriculum will educate

EM residents on core topics relevant to palliative care in the emergency department. It uses the Hospice and Palliative Medicine – Emergency Medicine (HPM-EM) domains developed by Shoenberger, et al.2 After completion, EM residents should be more comfortable with and proficient at initiating goals of care discussions in the ED, treating common palliative care symptoms, and establishing appropriate dispositions for palliative care and hospice patients. This longitudinal curriculum is presented to interns in order to prepare them for their critical care shifts and rotations.

Curricular Design: Our palliative care curriculum is a 1.5 year long, longitudinal conferenced-based curriculum designed for EM residents. We created a 12 hour curriculum over nine sessions which consist of lectures, case-based small group discussions, simulations, and multi-disciplinary panels. Sessions are led by EM faculty, HPM faculty and fellows, and other interdisciplinary team members.

Impact/Effectiveness: Prior to implementation of the curriculum, a survey was sent to 96 EM residents in order to assess beliefs, knowledge, and self-reported actions related to palliative care in the ED. This data will be compared to a linked post-curriculum survey. Objective data including frequency of palliative care consults, changes in code status, and admissions to the palliative care unit will be pulled from the EMR to analyze.

4 A Low-Fidelity Virtual Simulation Model for Medical Students

Sarah Dunn, MD; Michael Anana, MD

Learning Objectives: Our objectives were to create and introduce a virtual simulation curriculum that could easily be replicated using limited resources. We also aimed to assess medical students' perception of sim scenarios during the COVID-19 pandemic.

Abstract:

Background: The Coronavirus Disease 19 (COVID-19) pandemic brought significant disruption to medical student training in our emergency medicine clerkship. Students at our institution experienced limited in-person clinical rotations and transitioned to all-virtual didactics. In-person simulation training (sim) was one of these didactic sessions that had to be completely reimagined. In doing this, we wanted to maintain prior objectives of sim as well as use on-hand resources and create a low-fidelity model.

Educational Objectives: Our objectives were to create and introduce a virtual sim curriculum that could easily be replicated using limited resources. We also aimed to assess medical students' perception of sim scenarios during the COVID-19 pandemic.

Curricular Design: Students participated via a web conferencing application (WebEx), with one faculty member facilitating and another in the sim room with a low-fidelity sim mannikin. A laptop with webcam was used to show the sim room, including a monitor streaming vital signs via a low-cost application. Cases were developed from existing free open-access curriculum, with an emphasis on quick recognition of the sick patient and need to stabilize the patient as well as communicate with consultants. The curriculum was assessed via an optional, anonymous survey of students.

Impact: Our pilot sim curriculum is designed to be easily adaptable for UME and GME sites without many resources; it requires little prep time for faculty and free or low-cost applications and materials. Student response to the pilot virtual simulation was overwhelmingly positive (Table 1), with 67 of 93 (72%) of students responding to an anonymous optional survey. Additionally, 87% of respondents felt the virtual setting was as effective or more effective compared to in-person simulation. Future iterations will include improved audiovisual effects and further development of student roles.

Table 1. Pilot survey data.

Survey Item	Responding Strongly Agree or Agree	
(1- Strongly Disagree, 3-Neutral, 5 - Strongly Agree)	*Number*	*Percent*
The teaching methods used in this simulation were helpful and effective.	65/67	98%
I enjoyed how my instructor taught simulation.	67/67	100%
The way my instructor taught simulation was suitable to the way I learn.	59/67	89%
My instructor was prepared to facilitate this activity.	67/67	100%
My instructor encouraged participation and collaboration.	65/67	97%
My instructor was enthusiastic about this activity.	65/67	97%
The audiovisual equipment operated smoothly.	52/67	79%
The objectives of the simulation exercise were clearly defined.	63/67	94%
The sim session was well organized.	65/67	97%
The simulation session was appropriate for my level of training.	66/67	99%
The simulation session added value to the learning experience.	65/67	97%

5 A Near-Peer Taught Electrocardiogram Curriculum for New Emergency Medicine Residents

Duncan Grossman, DO; Kestrel Reopelle, MD; Eric Quinn, MD; David Shang, MD; Eric Lee, MD; Sally Bogoch, MD; Arlene Chung, MD

Learning Objectives: After participating, learners will be have improved recognition of significant EKG patterns

related to EM, and have increased confidence in EKG interpretation for new EM residents.

Abstract:

Introduction: The ability to rapidly and accurately interpret electrocardiograms (EKGs) in the emergency department is an essential skill required by emergency physicians. A near-peer taught EKG curriculum is a viable option for a comfortable and efficient learning environment for new emergency medicine (EM) residents.

Educational Objectives: After participating, learners will be have improved recognition of significant EKG patterns related to EM, and have increased confidence in EKG interpretation for new EM residents.

Curricular Design: The curriculum was designed based on Kern's six step approach. While all emergency medicine physicians must be adept at interpreting EKGs, an informal needs assessment specific to Maimonides residency showed consistent discomfort with this skill among graduates. A near-peer approach was chosen to foster an open, communicative, non-threatening environment for learners. There were multiple interactive web-based lectures that covered a wide variety of topics. The target audience was new EM residents and the course was taught by second and third year EM residents. A pre- and post-quiz was administered.

Impact/Effectiveness: Reaction level data showed improvement in comfort with EKG interpretation and self-reported knowledge of EKGs among residents who took the course. The near-peer approach may have allowed for a more comfortable environment for new residents to learn material. The course was easily implemented and will be held again next year.

6 A Novel Wilderness Medicine Curriculum for Emergency Medicine Residents

Elizabeth Hamilton, MD, MPH; Sara W. Nelson, MD

Learning Objectives: The objective of this curriculum was to teach emergency medicine residents how to assess, treat and transport patients in an austere environment through an interactive, team based didactic competition.

Abstract:

Introduction: Wilderness medicine is an essential component of Emergency Medicine residency education. Traditionally, wilderness medicine is incorporated into residency training through a combination of classroom based lectures and practical demonstrations. Since its inception in the fall of 2000, medical practitioners have been able to participate in regional Medical Wilderness Adventure Races (MedWAR™) to learn and practice wilderness medicine skills in a competitive setting. While MedWAR competitors have reported gaining valuable experience through participation, this model of team-based, competitive wilderness medicine simulation has never been applied to residency training. With this in mind, we developed the Wilderness Interactive Didactic Experience, or WildRIDE.

Objective: Our educational objective was for residents to attain comfort with assessing and stabilizing patients in the wilderness through an interactive team-based event modeled after a MedWAR™ competition.

Design: Teams of residents rotated through 6 instructor-led simulations to assess, stabilize and evacuate mock "patients" played by medical students. Instructors scored teams on their completion of critical actions and then debriefed the scenario. Teams also rotated through a circuit of self-directed skills stations to practice activities like improvised splinting, litter carries, shelter building, and wound care. Basic knowledge was assessed with multiple choice questions throughout the event.

Effectiveness: After participating in the WildRIDE event, 100% of residents who completed our post-event survey reported increased comfort with performing a patient assessment in the wilderness. All respondents felt the experience was valuable and that they enjoyed the team-based structure. 92% stated they would like to see the WildRIDE event offered in the future. Participants asked that more instruction be available at the skills station, which we will incorporate into our next WildRIDE.

7 A Pediatric Emergency Curriculum for Emergency Medicine Residents

Taylor McCormick; Genie Roosevelt, MD, MPH; Jennie Buchanan, MD; Maria Moreira, MD

Learning Objectives: To design a simulation-based, half-day boot camp for our senior resident class focusing the most anxiety-provoking pediatric emergencies, resuscitation skills, and uncommon procedures as the final component of a comprehensive pediatric emergency curriculum.

Abstract:

Introduction: All emergency medicine (EM) physicians must be skilled in caring for children as the vast majority of pediatric visits occur in community emergency departments. Exposure to critically-ill children during EM residency is limited, making simulation-based training a key component of pediatric emergency medicine education.

Curricular Design: Based on survey responses from senior residents and recent graduates on knowledge gaps in pediatric emergency care, an advanced pediatric emergency boot camp curriculum was developed and refined by expert pediatric emergency medicine educators. This course is an essential component of a comprehensive pediatric emergency curriculum which includes a basic pediatric resuscitation boot camp intern year, integrated core pediatric emergency didactics, quarterly pediatric emergency morbidity and mortality conference, a Neonatal Resuscitation Program course specifically for third

year EM residents, and a neonatal resuscitation rotation for seniors. A large group session included advanced pediatric EKG interpretation and recognition and management of tachydysrhythmias in children. High fidelity simulation cases included myocarditis, airway foreign body, and ductal-dependent congenital heart disease, with emphasis on resuscitation skills including difficult access, vasopressor and prostaglandin administration, the difficult airway, and needle cricothyrotomy.

Impact: This senior pediatric resuscitation boot camp was the most highly rated educational offering of the academic year, scoring 5 out of 5 points in content, relevance, and presentation by all 12 participants. Comments included: "a must for all residents," "so helpful, please let's do more of this," "fantastic," "thank you," "amazing sim session." All EM residencies should develop a similar pediatric emergency curriculum to ensure graduating residents are confident and competent to care for low-frequency, high-stakes, and high-anxiety pediatric emergencies.

8 A Redlining Primer: Structural Determinants of Health in Resident Orientation

Megan Healy, MD; Margaret Wolf, MD

Learning Objectives: Introduce incoming residents to the history of discriminatory housing and lending policies which directly contribute to current day health disparities in our highly segregated city.

Abstract:

Introduction/Background: It is essential for physicians to understand systemic racism in order to combat healthcare inequities. Many trainees have little exposure to historical issues like redlining that impact the health of the communities they serve. There is little guidance for which modalities are effective for teaching structural determinants of health. We created a redlining primer to introduce residents to discriminatory housing/lending policies which directly contribute to current day health disparities in our highly segregated city.

Educational Objectives:

-Introduce incoming trainees to the history of discriminatory housing/lending policies.

-Highlight the stark health disparities that are rooted in redlining, such as gun violence, lead levels, access to primary care and life expectancy.

Curricular Design: We created a session to introduce incoming house staff to discriminatory housing/lending policies and their impact on patients. The session included a lecture, followed by an interactive panel discussion with faculty experts in health equity research. The primer described the historical context of housing/lending policies in our city. We traced these practices to the resultant high levels of segregation and resultant disparities across important health markers that map along these divisions, including gun violence, lead levels, access to primary care and life expectancy.

Impact/Effectiveness: Sessions were held for all resident as part of their GME orientation, for a total of 206 participants. 42% of survey respondents reported they were unfamiliar with the concept of redlining prior to the session. 62% reported no prior dedicated teaching on this subject. The majority (96%) reported the topic was important/v. important to their clinical practice. 77% reported they were likely/v. likely to read more about this topic. 88% reported they would like to see structural topics like this covered more in their training.

9 Application of 3D Printed Anatomic Heart Models in Instruction of First-Time Learners of Bedside Echocardiography

Michael Vu, MD; Richard Gordon, MD

Learning Objectives:

- Improve first-time learners' understanding of echocardiographic anatomy
- Improve learners' echocardiographic image quality
- Reduce learners' time-to-acquisition of interpretable echocardiographic images

Abstract:

Introduction/Background: The ubiquity and utility of bedside transthoracic echocardiography (TTE) creates the need for a strong foundation in the anatomy. Since ultrasound is increasingly being integrated into undergraduate and graduate medical education, the opportunity to build a solid base in this area is critical.

3D printed anatomic heart models can help learners bridge the gap between 2D and 3D space with their ease of manipulation and open-source accessibility. This can potentially improve patient outcomes by enabling operators to make better-informed clinical decisions quickly at the bedside.

Educational Objectives:

1) Provide learners high-fidelity 3D cardiac models cut in cross sections representing each of the TTE views (parasternal long and short axis, apical four chamber, subxiphoid)

2) Improve learners' understanding of echocardiographic anatomy

Design: We obtained digital heart models from the NIH 3D print exchange (https://3dprint.nih.gov/) and cut them in cross sections for each of the TTE windows using modeling software. These files were then converted to physical models using a 3D printer.

Students participated in lectures followed by a hands-on scanning session using live volunteers where they practiced acquiring images. For each window, the appropriate 3D model was used to correlate the position of the patient's heart to the probe and to illustrate how the beam cuts the heart in cross-section.

Impact: The models were positively received. Students agreed that factors such as screen and probe indicator position

generated confusion when first trying to visualize the anatomy, and that being able to use the 3D models to correlate these significantly improved their understanding.

Our next steps for this project will be to formally integrate it into the ultrasound curriculum at our school and study its impact on learner-centered outcomes such as quality and time-to-acquisition of images that could be used to make clinical decisions.

Figure 1.

Figure 2.

10 Arterial Transduction: From the Kitchen to the Classroom

Matthew Szymaszek, DO; Scott Plasner, DO

Learning Objectives: To help residents become more self-sufficient and educated clinicians when it comes to placement, setup, and management of an arterial catheter.

To teach this seemingly simple procedure to completion while making it as realistic as possible without having to cannulate a patient or volunteer.

Abstract:

Introduction/Background: Arterial cannulation is a common emergency medicine and critical care procedure. Placement of the catheter is fairly straightforward and the technique is quite similar to most other vascular access procedures. But placing the catheter is only half of the procedure. We typically leave the ensuing tubing connections for transduction to our nursing colleagues, yet physicians are the ones asked to help troubleshoot when it is no longer functioning properly. Having the ability to practice and troubleshoot a simulated setup complete with waveform transduction would build confidence and proficiency.

Curricular Design: Most new residents quickly become proficient in vascular access techniques including arterial cannulation (A-line). However, tubing connections and setup are rarely the responsibility of the proceduralist. This A-line simulation was designed to teach this procedure from the start all the way through to waveform transduction and troubleshooting of the setup. Using simple cooking gelatin, a turkey baster, silicon caulking, a baking tin, and rubber tubing we were able to crudely simulate an artery, as well as generate a pulse wave through this closed system. The mechanical energy was then converted to electrical pulsations as reflected on the monitor. Steps included: cannulate the artery, get pulsatile flow up the catheter, connect the tubing and learn how to zero the line for accurate measurements, and finally generate a pressure waveform through the column of water within the tubing.

Impact/Effectiveness: This multiuse arterial simulator was perfect for resident procedure skill sessions and can be made in minutes for dollars. Now anyone can repeatedly simulate cannulating an artery, complete the ensuing steps to obtain a transducible pressure, and troubleshoot the A-line tubing setup and monitor connections. Modification to the consistency of the gelatin and trying other materials may make this even more life-like.

Figure.

11 Asynchronous Case-based Learning Using Slack: A Pilot

Katia Johnston, MD; Neeraj Chhabra, MD; Tarlan Hedayati, MD

Learning Objectives: We prospectively evaluated the feasibility and usability of Slack as an e-learning platform for case-based learning (CBL) for PGY-1 EM residents.

Abstract:

Introduction/Background: The use of internet technologies to facilitate asynchronous learning is common in graduate medical education. Advantages to virtual learning in EM include accommodating shift schedules and remote learning in the setting of the COVID-19 pandemic. Slack is a channel-based messaging application used in many industries to facilitate communication. The use of Slack has been described by EM residency programs as a recruitment tool, but little is known about the use of Slack as an educational tool.

Educational Objectives: We prospectively evaluated the feasibility and usability of Slack as an e-learning platform for case-based learning (CBL) for PGY-1 EM residents.

Curricular design: Clinical case vignettes for common EM chief complaints were written by a senior resident and reviewed by two EM board-certified faculty for content. Cases consisted of a prompt and residents progressed through cases by asking questions and requesting diagnostic studies. Additionally, prompts were provided to discuss clinical controversies in diagnosis and management. Slack was chosen as the platform due to free cost, ease of uploading multimedia, and the ability for anonymous participation. Cases were discussed as a group, one at a time, asynchronously, without dedicated participation time. Three cases were covered in the one month pilot period. The system usability scale (SUS), a validated ten-question survey that classifies tool usability, was then distributed to all interns via SurveyMonkey.

Impact/effectiveness: Fifteen of seventeen interns completed the survey. Mean SUS score was 77.2 (95% CI 70.6-83.7) indicating above average usability.

This pilot study indicates that Slack is a feasible and usable platform for asynchronous CBL learning. Further study is needed to better understand how to maximize resident learning using Slack. Plans for implementation and evaluation of Slack-based cases for all resident classes and medical students is ongoing.

12 Bridging The Gap: Incorporating An Interactive Student-Led Teaching Session Into A Virtual Clerkship

Natasha Wheaton, MD; Andrew Grock, MD; Stephen Villa, MD; Ignacio Calles, MD

Learning Objectives: Our objective is to create a teaching activity in which students effectively teach their peers, creatively involve their audience, and express their own interests and personality. We also used the activity to allow student implementation of course content regarding online teaching and learning.

Abstract:

Background: The progression and incorporation of technology into education in conjunction with the COVID19 pandemic has made virtual learning vitally important. However, it lacks the interactions of a traditional rotation that highlight the intangible qualities that often influence both program rank lists and student views of a residency. Here, we provide students the opportunity to express their own creativity and unique characteristics despite the virtual learning modality.

Curricular Design: The exercise provides a break from traditional lectures while allowing students an opportunity to leave a unique impression. Students created a five minute presentation teaching a non-medical topic. We provided example slides and video demonstrations ahead of time. Students received multiple days of content on effective teaching modalities and learning strategies in preparation for effective presentation in the virtual environment. They each discussed ideas with a resident mentor, allowing them to feel comfortable and confident in their topic selection and teaching plan. Students presented to peers with a resident or faculty facilitator. Topics included a live cooking show, kickboxing class, and guided meditation. Presenters received individual feedback from the facilitator. The students evaluated the session in the post-rotation survey. They were informed prior to the exercise that they would not be formally graded, but would be provided feedback for improvement purposes.

Impact: Of 25 survey respondents, 92% agreed or strongly agreed that the session was worthwhile and should be repeated. 24% listed the teaching session as their favorite aspect of the rotation. Students felt it made the rotation enjoyable despite the limits of virtual learning. The teaching session in our virtual clerkship will remain a cornerstone of future virtual efforts as it proved effective in helping bridge the digital gap and made our students feel closer to the program and their peers.

Closing Rotation Feedback Response to "What was my favorite thing about this rotation?"
The teaching sessions! I really enjoyed the creative outlet for people to pick any topic and teach it in any way they like. I think this was especially effective in making the rotation enjoyable even with the limitations of this being a virtual rotation.
My favorite day of the rotation was definitely the teaching session. I loved being able to get to know everyone a little better that day and it was just a fun way to learn something new.
The teaching exercise. It was amazing to see what everyone else was passionate about and definitely learned some new things.
I also really liked the teaching session. It was a great way to get to know more about my peers and build a bond.

Table. Participants filled out a feedback survey at the conclusion of the rotation. Shown above are selected responses when asked about their favorite aspects of the course.

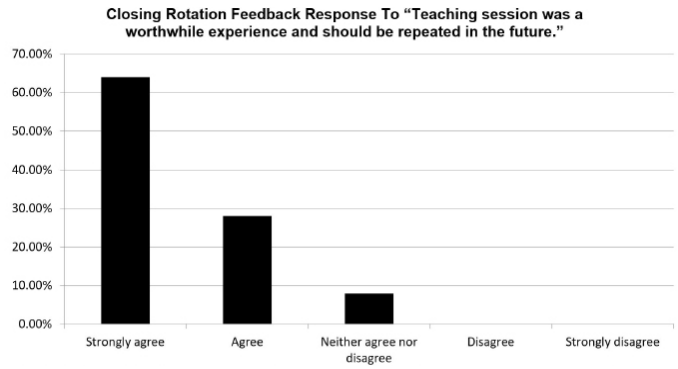

Figure. Participants filled out a feedback survey at the conclusion of the rotation. Shown are aggregate responses to a multiple-choice questions assessing the reception of the teaching session. 26 participants were sent the survey. 25 participants responded. 64% of respondents answered "strongly agree" and 28% answered "agree" for a total of 92% positive response. 2% of respondents responded "neither agree nor disagree".

13 Chest Cavity Model for Thoracotomy Simulation

Danica Zold, MD

Learning Objectives: To create a reusable chest cavity model for thoracotomy simulation that is realistic to the procedure's inherent challenges; To limit out of pocket cost by implementing recycled materials from within the emergency department; To enhance resident medical education and improve thoracotomy proficiency.

Abstract:

Introduction: The ED thoracotomy is rarely performed, but a critical procedure well within our scope of practice, and one for which every resident must be prepared.

Objectives: To create a chest cavity model that can be used in the simulation of an ED thoracotomy. Importance was placed on creating a budget-friendly, near life-size model, with limited resources, which could be used with and withstand the repetitive use of actual thoracotomy tools.

Design: This model is designed to repurpose commonly found emergency departmental supplies. Limited additional supplies required were easily found at a local grocery store for a very low cost. Examples of supplies include endotracheal tubes as "ribs", individually packaged and sealed chicken breasts as "myocardium", jello as "blood" and chuck pads as "skin". Obstacles while using the model simulate real-life challenges such as working within a confined space, exsanguination, and delivering the myocardium from the pericardial sac while avoiding phrenic nerve injury. Each material "incised" during performance of the procedure can easily be refreshed or replaced, creating a new, reliable experience for each participant, every time. Strengths include cost, simplicity, and versatility. Materials can easily be substituted or exchanged for those more readily available or accessible. Like most first time creations, this prototype would benefit from many modifications, including ways to increase durability.

Impact: Overall, this educational tool successfully provided residents with the ability to practice the ED thoracotomy. It withstood 10+ uses throughout the day, and could likely withstand more depending on the number of additional exchangeable "skin" layers and "myocardiums" prepared in advance. It enhances the educational experience for residency programs with limited training resources, builds confidence and skill proficiency, and prepares residents for success prior to a real-life clinical encounter.

Figure 1.

Figure 2.

14 Creation and Evaluation of Free Open Access Medical Education (FOAM) Resources: Electrocardiogram Triage as a Virtual Infographics Challenge in EM Resident Didactic Conference

Kathryn Fisher, MD; Anisha Turner, MD; Malford Pillow, MD, MEd

Learning Objectives: Our objective for this initiative was to create a novel and interactive activity that would be feasible in the virtual setting and challenge the residents to collate and evaluate information to create an infographic resource, all while reviewing FOAM evaluation and the content area selected.

Abstract:

Emergency Medicine (EM) residents utilize free open access medical education (FOAM) sources, and many create them to distribute publicly. They often lack training on creation of educational resources despite serving in educator roles within their communities. During the COVID-19 pandemic, use of virtual resources increased with medical professionals seeking information from FOAM sources. The transition to virtual didactic conferences posed the challenge of creating active learning opportunities. Here we present a novel, interactive FOAM creation challenge for EM residents. Our objective was to create a unique challenge where residents would compete while creating, evaluating and disseminating FOAM resources. In May 2020, all 42 EM residents were placed in groups of 5-7 with diversity in training level and were tasked with creating a single-page infographic using free online sites to be used on-shift as a point-of-care reference. Groups met virtually during conference. We chose ECG interpretation and triage in the emergency department as the topic. At our institution, PGY-3 residents are allowed to "sign" triage 12-lead electrocardiograms (ECGs), a process including determining if it meets ST-elevation myocardial infarction (STEMI) criteria and identifying other pathologies needing immediate intervention. We further subdivided the topic into determination of STEMI, STEMI equivalents, STEMI mimics and other emergent findings. The residents and faculty jointly created and validated a novel grading rubric (Figure 1). Infographics from each team were then de-identified and assessed using the rubric and disseminated.

This innovation can be utilized in any level and on any topic in medical education. It created an interactive activity challenging residents to work together virtually while applying knowledge to create usable on-shift resources. This intervention was met with positive feedback on its novelty, ability to make virtual learning interactive, and its relevance.

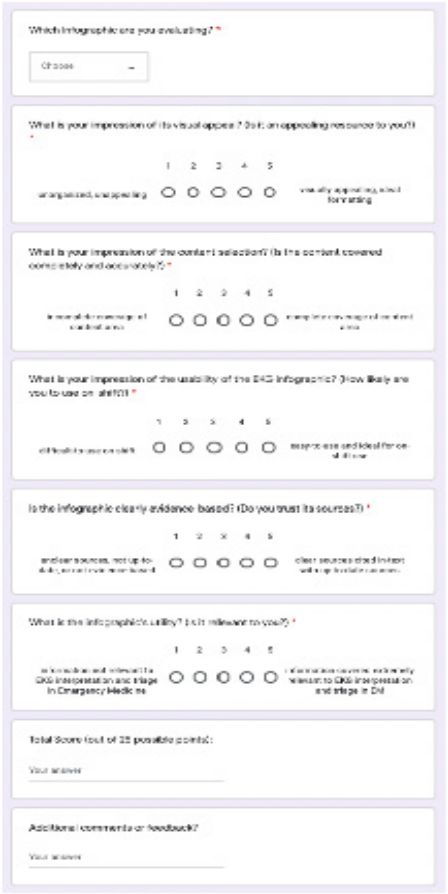

Figure 1. Online grading rubric utilized based on 5 categories: content, usability, evidence-based, and utility.

15 Creation of an Innovative Quality and Patient Safety Curriculum for an Emergency Medicine Residency during COVID-19

Samita Heslin, MD, MBA, MPH, MA; Robert Schwaner, MD; Richard Dickinson, MD; Candice King, RN, MSN, NP; Somair Malik, MD; Scott Johnson, MD; Scott Weingart, MD; Eric Morley, MD, MHA, MS

Learning Objectives: Our goal was to create a Quality and Patient Safety Curriculum for EM Residents that included interactive lectures, resident projects, infographic emails, and simulations. This curriculum was developed during COVID-19 and therefore was adapted for virtual and in-person socially distant education.

Abstract:

Introduction/Background: The American College of Graduate Medical Education (ACGME) requires residents develop skills to analyze quality assessment methods; identify system errors; and participate in quality improvement projects. When surveyed, 52% of EM residencies had <4 hours/year of

quality education and 62% had <4 hours/year of risk education.

Educational Objectives: Our goal was to create a Quality and Patient Safety Curriculum for EM Residents that included interactive lectures, resident projects, infographic emails, and simulations. This curriculum was developed during COVID-19 and adapted for virtual and socially distant education.

Curricular Design: We created our Quality and Patient Safety curriculum based on initiatives important to our ED, such as sepsis care. We designed 4 main educational programs:

1) Quality Corner: Weekly, a colorful infographic on quality metrics, new patient safety initiatives, or EMR tips was emailed (Image 1: Example Quality Corners).

2) Monthly Lectures: A 45-minute interactive quality lecture was given monthly at conference. Residents were given case-based scenarios followed by an online poll; real-time results were displayed. This was followed by a 1-hour deep-dive on a patient case.

3) Resident Projects: Each resident was assigned to a group and focused on a quality metric. The groups were taught how to do a literature review; write an IRB; create a datasheet; and implement a project.

4) Quality Simulations: During resident shifts, a chief resident ran quality group and individual case simulations.

Impact/Effectiveness: Residents completed anonymous surveys. For the residency lectures, 39 of 48 (81%) residents responded - 82% stated they were helpful; 84.6% learned something new; and 84.6% recommended they be continued. For the Quality Simulations, 28 of 30 (93%) residents responded - 100% said they were helpful; 93% learned something new; and 100% recommended they be continued.

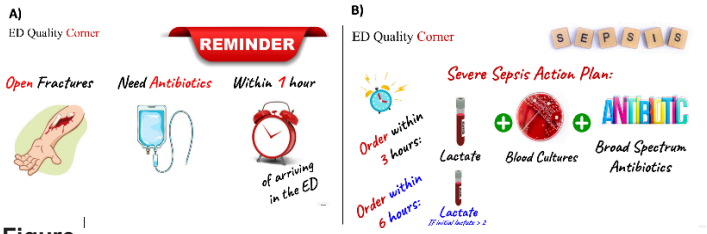

Figure.

16 Cultivating Shame Resilience Through Connections: A Curriculum

Jillian Duffy; Laura Welsh, MD; Elmira Andreeva, MD; Avery Clark, MD; Kerry McCabe, MD

Learning Objectives: We sought to provide Emergency Medicine (EM) interns with a framework for understanding the prevalence of the shame experience and its effect on professional growth and identity, and developing shame resilience to improve their education and wellness.

Abstract:

Introduction: From errors to imposter syndrome, shame is pervasive in medical training. It causes disengagement from learning, impaired empathy, and burnout. Transition periods, such as intern year, are high risk for emotional events leading to prolonged shame experiences. Shame resilience can be fostered by reframing our emotional response to adopt a growth mindset and improve education for learners.

Curricular Design: We designed a three-part workshop series to address EM interns' vulnerability to feeling shame while navigating internship. Content was based on a needs assessment of current residents, literature review, and consensus from a group of faculty and residents. Each workshop consisted of a ninety minute in-person session led by residents and attendings aimed at identifying, normalizing, and discussing the shame responses unique to the EM resident. Sessions spanned over 6 months to allow for a variety of experiences to inform discussions. Each session built upon the concepts and conversations from the prior, guiding interns through skills to build shame resilience within oneself and amongst the peer group. Skills were reinforced by small group discussions, self reflection through journaling, and normalization via first-hand accounts of shame experiences from senior residents and attendings.

Impact: Initial qualitative feedback by participants has been overwhelmingly positive. Participants were eager to discuss errors and feelings of imposter syndrome in a space that normalized these experiences. Interns continued these shame conversations through informal group texts and on shift. Further research is needed to explore the effectiveness of this curriculum over the course of residency.

17 Direct Observation Teaching Shifts (DOTS): An Approach to Using 360-degree Assessments

Caroline Molins, MD; Carmen J. Martinez Martinez, MD MSMEd

Learning Objectives: This innovation creates a Direct Observation Teaching Shifts (DOTS), in order to facilitate 360-degree evaluations. You will learn how DOTS increased these and the feedback EM residents receive.

Abstract:

Background: ACGME requires that residencies must provide evaluation and feedback from multiple evaluators such as faculty, fellow residents, medical students, patients and ancillary staff. These are called Multisource feedback (MSF) or 360-degree assessments. Direct observation of resident's patient encounters and their individual performance is an essential aspect of competency-based education. We created the direct observation teaching shifts (DOTS). DOTS are scheduled shifts in which paired faculty/

residents were assigned a chief complaint based patient encounter and the 360-degree assessment was used as the evaluation tool.

Objective: The objective was to assess the resident's perceptions and number of completed 360 evaluations after the introduction of DOTS. We hypothesize that the implementation of DOTS will increase the number of 360-degree evaluations completed by EM residents. The second objective was to use direct observation to engage the supervising physician in creating educational opportunities and timely feedback.

Curricular Design: Over a 12-week period, residents that were scheduled to the EM rotation were assigned DOTS paired with a designated faculty member. Specific lower volume shifts were chosen to maximize educational opportunities. All 18 residents had the opportunity to have at least 1 DOTS. At the completion of the 12-week period, residents were surveyed on their perception of the learning experience.

Impact/Effectiveness: After completing the 12-week period, we saw a marked increase in the number of 360 evaluations. At least, half of the PGY 1, five out of six PGY2 and all the PGY3 had at least 2 DOTS. Most of the residents felt that they received individualized learning (83%) from the attending and benefited from the learning experience. In conclusion, the implementation of DOTS was well received by EM residents and it tripled the number of completed MSF and provided direct observation periods with feedback.

18 Does a Simulated Didactic Effectively Teach Emergency Medicine Residents to Perform a Cervical Exam in Laboring Women, and Does it Affect Their Future Practice in Managing These Patients?

Eleanor Aluise, MD; Angela Chen, MD

Learning Objectives:

We aim to augment the knowledge and physical exam skills of emergency medicine residents surrounding the laboring cervical exam using lecture material and simulated practice.

Abstract:

Introduction: The cervical exam in laboring women is an essential skill for emergency medicine residents, particularly for community-bound doctors without in-house obstetrics. We did a needs assessment of residents in our program and found that many felt unsure in the exam and disposition of laboring women despite rotating on the labor and delivery service.

Educational Objectives: We aim to augment the knowledge and physical exam skills of emergency medicine residents surrounding the laboring cervical exam using lecture material and simulated practice.

Curricular Design: We designed a two-pronged educational model including a traditional slide-based lecture and a simulated teaching session. All participating residents received the lecture. A subset also received the simulated teaching session using the PROMPT Flex Cervical Dilation and Effacement Model. While simulation-based teaching is well established in our residency, simulation of the laboring cervical exam is a new approach to this topic. All participants completed pre- and post- surveys which assessed both their knowledge of the material as well as their confidence in managing these patients.

Impact: Pre-survey results of 78 participants (out of 96 in the residency, or 81.3%) were collected. 83.4% rate their confidence in their laboring cervical exam as a 1 or 2 out of 5. These findings are consistent with our initial needs-based assessment.

Post-survey results continue to be collected as more residents participate in the project. Preliminary outcomes demonstrate an appreciable increase in confidence. 50.0% of lecture-only respondents rate their confidence in their laboring cervical exam as a 1 or 2 out of 5, and none of those who received the sim session do.

If trends continue, we hope to see this is an effective way to teach this topic. If so, we hope to continue offering effective supplementary teaching for our residents to augment their established experience with the laboring cervical exam.

19 Effect of a QR-code linked mental model posted in resuscitation rooms to promote real-time performance feedback

Aleksandr Tichter, MD; Adianes Feliciano, MD

Learning Objectives:

To increase the frequency feedback delivered during emergency department shifts.

To provide clinical supervisors with a simple and reliable framework to give feedback of high quality and utility.

Abstract:

Curricular Design: An online feedback from was developed using a mental model for the primary and secondary surveys of patients presenting to the emergency department with traumatic injuries. A QR-code which linked to the form was posted in each of 5 resuscitation rooms as well as the physician workstation. Faculty and residents were provided education related to the purpose and content of the form via email and direct communication prior to implementation, as well as intermittently thereafter. Supervisors were encouraged to scan and fill out the form together with learners as soon as the trauma assessment was complete and the patient was stabilized.

Impact/ Effectiveness: Over the course of 4 months, 36

distinct episodes of feedback were logged using the online form: 9 by emergency medicine faculty, and 27 by senior-level residents. The learner targets included 30 interns and 6 senior-level residents. The feedback scenarios included 4 "Code-1" (high acuity), 2 "Code-2" (medium acuity), and 30 "Code 3" (low acuity) trauma resuscitations. The initial implementation of this innovation was successful in encouraging feedback and providing a favorable, objective framework to provide it. The feedback log suggests more initial enthusiasm for and engagement with the innovation among residents than faculty. Future plans include more targeted education for the physician faculty, and mapping the feedback form to ACGME Milestones for use by the Clinical Competency Committee as a data point to inform milestone assignments. Additionally, for proof-of-concept, this pilot project focused exclusively on trauma resuscitations, but will be expanded to include a pre-identified series of discrete observable behaviors (i.e., providing discharge instructions, calling a consultant, performing a procedure).

20 Effectiveness of Simulation-Based Mastery Learning Curriculum for Tube Thoracostomy in Emergency Medicine (EM) Residents

Max Berger, MD; Laura Weber, MD; Janice Shin-Kim, MD; Jessica Leifer, MD; Soma Pathak, MD; Shannon McNamara, MD

Learning Objectives/Educational Objectives:

1. Diagnose pneumo- and hemothorax on chest x-ray and ultrasound

2. Confidently and competently place a chest tube using sterile technique

Abstract:

Introduction/Background: For rare, high-risk procedures in EM, simulation is an ideal modality to supplement clinical training. Simulation allows for deliberate practice of procedural skills without concern for patient harm. Simulation-based mastery learning is the gold standard for procedure training, and has been used to successfully train residents in a variety of procedures.

Curricular Design: We developed a simulation-based mastery learning course for tube thoracostomy to train residents at our institution. The course consists of independent pre-work followed by a 2-hour hands-on session. The rubric used for assessing competence was based on the published, validated TUBE-iCOMPT checklist. The in-person session consists of 1)baseline assessment; 2) deliberate practice on individual aspects of the procedure; 3) final assessment. If a minimum passing score is not achieved, additional coaching and practice occur until the learner achieves the minimum passing score.

Impact/Effectiveness: 23 PGY-2 residents have completed the course. There was a statistically significant increase in learners' modified TUBE-iCOMPT score out of 79 points (pretest M=60.04, SD=8.35 to posttest M=74.26, SD=4.68, $p<0.001$). Learners' confidence in their ability to correctly place a chest tube also increased on scale from 1 to 10 (precourse M=4.38, SD=1.95 to postcourse M=7.78, SD=0.95). Our course was well received by learners and effective in improving their directly observed procedural skills in simulation. A next step will be to assess outcomes data to see if our course has any effect on complications rates for chest tubes placed at our institution. We are also implementing a similar course for pigtail catheter placement.

21 Emergency Medicine Clerkship Curricular Revision Using a Targeted Needs Assessment

David Wald, DO

Learning Objectives: Our objective was to perform a curriculum renewal for our EM clerkship using a targeted needs assessment.

Abstract:

Prior updates of our EM clerkship curriculum have been based largely on perceived need. A review of the published national curriculum set the groundwork for a formal approach to curriculum renewal using a targeted needs assessment. We felt this approach would provide us with valuable information as we moved forward with the curriculum renewal process.

A two part targeted needs assessment was developed. We first surveyed stakeholders; chief residents, clerkship and residency leadership to identify concepts, complaints, procedures / tasks, conditions and clinical decision rules perceived as important for all students to be exposed to during their required 4 week EM rotation. Responses were reviewed to identify patterns. A follow up needs assessment was distributed to a larger group of faculty, residents and students. This prioritized response options based on perceived level of importance; very, somewhat or less important.

All (n-14) participants responded to the initial survey. Data obtained populated responses for the follow up survey. Fifty three (87%, n-61) responded to the follow up needs assessment. Four key concepts were felt to be "Very Important" to emphasize during the clerkship; approach to the undifferentiated patient, performing a focused H&P, recognizing "Red Flag" symptoms, sick vs. not sick. These are now a focal point of discussion during orientation. Four complaints were felt to be "Very Important"; abdominal pain, altered mental status, chest pain and shortness of breath. These are incorporated into didactic cases used during the clerkship. Additional cases have been developed to reflect the importance of conditions identified through the needs assessment. Key clinical decision rules have been

incorporated into our evidence based medicine assignment.

Pre / post curricular renewal learner evaluations have been positive and a trend in improved end of rotation exam scores were noted after the curricular changes we made.

22 Emergency Medicine Residency Milestones Incorporated into First and Second Year Medical Student Elective

Christina Cantwell, MS; Jonathan Lee, MD; Soheil Saadat, MD, PhD; Nicholas Bove, MD; Sangeeta Sakaria, MD, MPH, MST; Alisa Wray, MD, MAEd; Shannon Toohey, MD, MAEd

Learning Objectives: We describe an ACGME level 1 milestones-based elective curriculum for first and second year medical students interested in emergency medicine. The elective is designed to better prepare students in pre-clinical years for meeting level 1 milestones prior to graduation.

Abstract:

Background: The ACGME and American Board of Emergency Medicine describe 23 sub-competencies with milestones ranging from level 1 (expected of an incoming resident) to level 5 (demonstrates abilities of an attending). Studies of incoming interns have found that many fall short of meeting level 1 milestones. To address this gap, we developed the Milestones Elective, a level 1 milestones-based curriculum offered to first and second year medical students in pre-clinical years to better prepare them to meet these milestones prior to graduation.

Objective: To prepare first and second year medical students who complete the elective to meet level 1 milestones.

Curricular Design: The elective was designed with a faculty advisor closely involved with residency training and consisted of 15 events hosted by the school's Emergency Medicine Interest Group during the academic year. Each event was assigned sub-competencies based on content and format (lecture or procedure-based). Four of the 23 sub-competencies were omitted because they were better suited for third and fourth year medical students. Elective credit was earned by attending a combination of events to satisfy all 19 sub-competencies and at least eight events. Students self-reported perceived preparedness in satisfying level 1 milestones through anonymous pre- and post-curriculum surveys.

Impact: We found statistically significant increases in self-reported preparedness in 16 of the 19 level 1 milestones included in the elective and more broadly in the competencies of: patient care, medical knowledge, system-based practice, and practice-based performance improvement. This elective can be readily recreated in other programs. Implementing a milestones-based curriculum during pre-clinical years may better prepare students interested in EM for meeting level 1 milestones prior to residency by enhancing their learning experience and potentially improving self-confidence prior to entering clinical rotations.

Table 1. Categorizations of ACGME milestones included in the EMIG Milestones Elective.

Competency	Sub-competency	Level 1 Milestone
1: Patient Care	PC1: Emergency stabilization	Recognizes abnormal vital signs
1: Patient Care	PC2: Performance of focused H&P	Performs and communicates a reliable, comprehensive history and physical exam
1: Patient Care	PC3: Diagnostic studies	Determines the necessity of diagnostic studies
1: Patient Care	PC4: Diagnosis	Constructs a list of potential diagnoses based on chief complaint and initial assessment
1: Patient Care	PC5: Pharmacotherapy	Knows the different classifications of pharmacologic agents and their mechanism of action. Consistently asks patients for drug allergies
1: Patient Care	PC6: Observation and reassessment	Recognizes the need for patient re-evaluation
1: Patient Care	PC7: Disposition	Describes basic resources available for care of the emergency department patient
1: Patient Care	PC8: Multi-tasking	Manages a single patient amidst distractions[a]
1: Patient Care	PC9: General approach to procedures	Identifies pertinent anatomy and physiology for a specific procedure. Uses appropriate Universal Precautions
1: Patient Care	PC10: Airway management	Describes upper airway anatomy. Performs basic airway maneuvers or adjuncts (jaw thrust/chin lift/oral airway/nasopharyngeal airway) and ventilates/oxygenates patient using BVM
1: Patient Care	PC11: Anesthesia and acute pain management	Discusses with the patient indications, contraindications and possible complications of local anesthesia. Performs local anesthesia using appropriate doses of local anesthetic and appropriate technique to provide skin to sub-dermal anesthesia for procedures
1: Patient Care	PC12: Other diagnostic and therapeutic procedures: Goal-directed Focused Ultrasound	Describes the indications for emergency ultrasound
1: Patient Care	PC13: Other diagnostic and therapeutic procedures: Wound management	Prepares a simple wound for suturing (identify appropriate suture material, anesthetize wound and irrigate). Demonstrates sterile technique. Places a simple interrupted suture
1: Patient Care	PC14: Other diagnostic and therapeutic procedures: Vascular access	Performs a venipuncture. Places a peripheral intravenous line. Performs an arterial puncture
2: Medical Knowledge	MK: Medical knowledge	Passes initial national licensing examinations (e.g. USMLE Step 1 and Step 2 or COMLEX Level 1 and Level 2)

[a]Indicates level 1 milestone not included in the elective.

Table 2. Milestones assigned to each event and event descriptions.

Event	Description	Sub-competencies
Wilderness Medicine	Camping weekend and educational conference in the San Bernardino Mountains instructed by EM physicians	PC1, PC5, PC6, PC7, PC9, PC10, PC13, PC14, MK, ICS1, ICS2
Intro to EM Talk	EM attendings introduce the field and dynamic flow in the emergency department	PC3, PC5, PC6, MK, PROF1, ICS1
Procedures Workshop	Four rotating stations of suturing, ultrasound-guided IV insertion, IV access, intubation	PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC9, PC10, PC11, PC12, PC13, PC14, PBLI
Talk Shops with EM Attendings	Five dinners held throughout the year at ED attendings' house	PC7, SBP2, PROF1, ICS1, ICS2
Research Opportunities Dinner	Dinner with ED attendings where ongoing research projects are introduced	MK, SBP2, PBLI
Shadowing	ED shadowing scheduled by students based on availability	Varied. Students were allowed to choose up to 7 milestones per day of shadowing for credit with a brief description of cases seen that satisfy the milestones chosen.
Jeopardy	Test-your-knowledge of EM related topics	PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC10, PC11, PC12, PC13, PC14, MK, PBLI, ICS1, ICS2
Matching into EM Panel	Attendings describe the path to matching into EM	SBP2, PROF1, ICS1, ICS2
Disaster Medicine Talk	Lunch talk with EM physician describing the role of disaster medicine	PC1, PC4, PC9, PC13, ICS2
Cadaver Workshop	Procedures demonstrated on fresh tissue from cadaveric donors	PC1, PC2, PC4, PC9, PC10, PC11, PC12, MK, PBLI
Post-Match Panel	Graduating MS4s discuss their path to matching into EM	SBP2, PROF1

23 Emergency Medicine: Diversity in Discipline, Professions, and Patient Populations

Maglin Halsey-Nichols, MD; Ayesha Ibrahim, MD Candidate; Lauren Querin, MD, MS

Learning Objectives: This course focuses on providing medical students with early exposure to EM and highlights how the specialty addresses areas of healthcare disparities. This course also provides learning opportunities in EM to high school and undergraduate students from diverse and underserved populations.

Abstract:

Background: Despite growing medical student interest in the field of Emergency Medicine, many medical school curriculums lack exposure in the preclinical years. Early exposure has been shown to be a factor in students' decisions to pursue EM as a career. Similarly, programs for high school and college students have previously demonstrated positive effects on students' decisions to pursue careers in medicine.

Educational Objectives: Gain exposure to the field of Emergency Medicine and its subspecialties. Discuss how EM addresses healthcare disparities. Appreciate interprofessional collaborations in EM. Experience patient care in prehospital and ED settings. Develop teaching skills for use throughout education and career.

Curricular Design: At the University of North Carolina, there is a paucity of EM opportunities for early medical students. This EM curriculum includes 3 weeks of medical student education and 1 week of an EM immersion experience for high school/undergraduate students, which medical students help develop and teach. Objectives are achieved using didactics, procedure labs, ultrasound, simulation, and discussions with physicians and interprofessional colleagues. Initial curriculum plans included clinical shifts. Due to COVID-19, the course was shifted to a virtual format. Course evaluation included pre- and post-course surveys completed by the students.

Impact/Effectiveness: The initial course was delivered in 2020 with 6 students. A post-course survey showed globally positive changes with improvements in caring for a sick patient, procedural skills and in understanding roles of the EM physician and interprofessional colleagues. In the future, we plan to increase participant size, add in-person sessions, and expand teaching about healthcare disparities. We believe this curriculum can be a model for educating well-rounded EM physicians and providing underrepresented and underserved students with opportunities in medical education.

Table 1. Medical student perception of individual comfort level and understanding of different aspects of Emergency Medicine and Interprofessional collaboration on a scale of 0 (no understanding/not comfortable at all) to 10 (extremely comfortable/high understanding) beofre and after course.

Question (Comfort Level/Understanding on a scale from 0-10)	Pre-Course: Mean (N=6)	Post-Course: Mean (N=5)	Change?
Identifying a sick patient.	2.8	6.6	Positive
Caring for a sick patient	1.8	4.6	Positive
understanding roles of Emergency Medicine physician	3.2	7.6	Positive
interest in a career in Emergency Medicine	4.8	7	Positive
understanding of role - nursing	4.8	7.6	Positive
understanding of role - respiratory therapist	2.4	7.4	Positive
understanding of role - care management	3.4	7	Positive
understanding of role - psychiatry	4.4	7.8	Positive
understanding of role - child life specialist	0.6	6.4	Positive
understanding of role - pharmacy	3.6	6.6	Positive
understanding of role - peer support specialist	3	6.8	Positive
understanding health disparities = racial/ culture	6.8	7.4	Positive
understanding health disparities = socioeconomic status	7	7.6	Positive
understanding health disparities = uninsured	6.8	7.8	Positive
understanding health disparities = sexual orientation and gender identity	6	7.2	Positive

Table 2. Medical student perception of individual comfort level with procedural skills and ultrasound on a scale of 1 (not comfortable at all) to 4 (extremely comfortable) before and after course.

Procedures 1 = not comfortable at all 2 = somewhat comfortable 3 = moderately comfortable 4 = extremely comfortable	Pre-Course: Mean (N=6)	Post-Course: Mean (N=5)	Change?
Two-handed surgical knot tying.	1	2.4	Positive
One-handed surgical knot tying.	1	2.4	Positive
Instrument knot tying.	1	1.8	Positive
Simple interrupted suturing.	1	2	Positive
Splinting for orthopedic injuries.	1.17	1.4	Positive
Using a bag-valve mask for ventilating a patient.	1.83	3	Positive
Placement of a nasopharyngeal or oropharyngeal airway.	1.5	2.4	Positive
Intubation.	1.67	2.4	Positive
Using a cardiac defibrillator.	2.17	2.2	Neutral
Starting IVs.	2	1.6	Negative
Central line placement.	1.17	1.4	Positive
Bedside cardiac ultrasound.	2.17	3	Positive
FAST ultrasound exam	1.17	2.8	Positive
Lung ultrasound.	1	2.8	Positive

24 Enhancing Resident Confidence, Knowledge, and Skills in Obstetrics and Neonatal Resuscitation Through Simulation

Maria Moreira, MD; Taylor McCormick, MD; Jennie Buchanan, MD

Learning Objectives/Educational Objectives:
Objectives included providing hands-on training to improve confidence in high-risk deliveries and neonatal resuscitation, and assuring ACGME delivery requirement compliance.

Abstract:
Introduction/Background: COVID19 has affected off-service rotations for emergency medicine residents by limiting provider numbers in patient care areas. To mitigate the educational impact of decreased exposure to deliveries, we developed an obstetrics (OB) simulation (sim) curriculum.

Curricular Design: The curriculum consists of 4 sim sessions: 1) normal vaginal delivery & shoulder dystocia; 2) breech, cord prolapse, cord presentation; 3) postpartum hemorrhage & perimortem c-section; and 4) breech delivery, neonatal resuscitation, post-partum hemorrhage care. Sessions include a facilitated discussion, practice of techniques and procedures, and a comprehensive, high-fidelity sim. By the end of the 4 sessions, residents complete 13 deliveries, 1 c-section, 2 post-partum hemorrhage resuscitations, and 1 pediatric resuscitation. Throughout the year they will receive monthly e-mailed pearls for spaced repetition of knowledge. Additionally, at the end of the academic year, residents will repeat the final session, perform another c-section, and practice 5 additional deliveries.

Impact/Effectiveness: After overwhelmingly positive session feedback from the class of 2020, the curriculum was added as a required adjunct to the OB rotation. The class of 2021 has completed the 4 sessions prior to rotating on OB. Residents completed a 15-item confidence and knowledge assessment prior to the 1st and 4th sessions which demonstrated a significant improvement in both median reported confidence on a 3-point likert scale (1.5 [interquartile range(IQR) 1.2-1.5]) vs 2.1 [IQR 1.9-2.3], p=0.02) and median percentage of correct responses for knowledge-based questions (18 [IQR 12-65] vs 82 [IQR 71-88], p=0.03). Residents will take the quiz at the end of the academic year to assess confidence and knowledge retention, and further refine the OB sim curriculum.

25 Escape the EM Boards: Interactive Virtual Escape Room for GI Board Review

Megan Gillespie, MD

Learning Objectives: Review high yield gastrointestinal in-training exam and board material via an interactive virtual escape room.

Abstract:
2020 is a year that will forever change medical education. The coronavirus disease 2019 pandemic caused the majority of medical education to abruptly transition to online platforms. Now more than ever, creative and engaging methods for expanding clinical knowledge and teaching teamwork as well as unique integrations of technology for medical education delivery are needed. This educational innovation discusses utilization of gamification and technology-enhanced active learning to deliver a fun and interactive distance learning activity that resembles an escape room.

This developed interactive virtual escape room is a no cost, unique alternative educational activity that can be done individually or in small teams in a remote, in-person, or mixed location setting. This interactive virtual escape room was created through utilization of Google Slides, Google Forms, Google Docs, educandy.com, jigsawplanet.com, puzzle.org, and bitmoji.com. The clues for this escape room were compiled from high yield gastrointestinal in-training exam and board review material from Dr. Carol Rivers' Written Board Review resources via Ohio ACEP app, "The Ultimate Emergency Medicine Guide: The only EM book you need to succeed" by Dr. Sajid Khan, RoshReview Question Bank, and Hippo EM Board Review Videos.

The target learner for this educational innovation is emergency medicine residents of all postgraduate years and third- or fourth-year medical students on emergency medicine rotations. Learners are sorted into groups and video conference and screen sharing were utilized to have participants work together as a team to attempt to "escape" this interactive virtual escape room.

Post-curriculum survey demonstrated that all of the participating residents and students enjoyed this alternative didactic activity and that the majority learned something, preferred a game like this to a standard lecture, and thought this was a helpful way to review for emergency medicine boards or in-training exams.

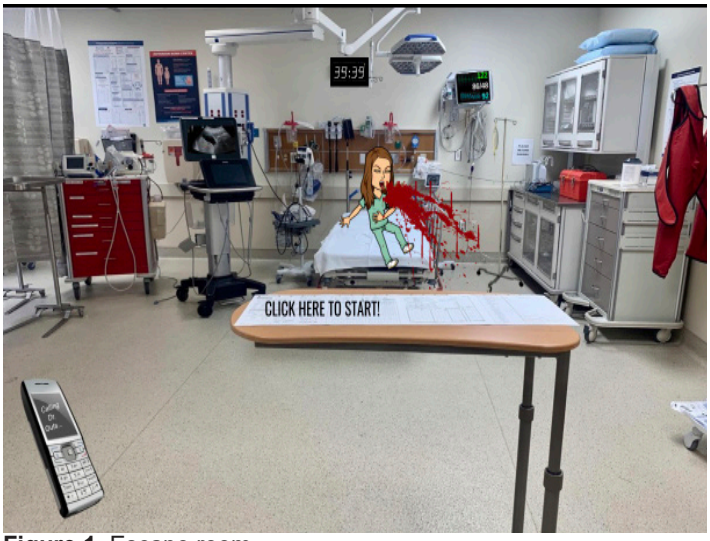

Figure 1. Escape room.

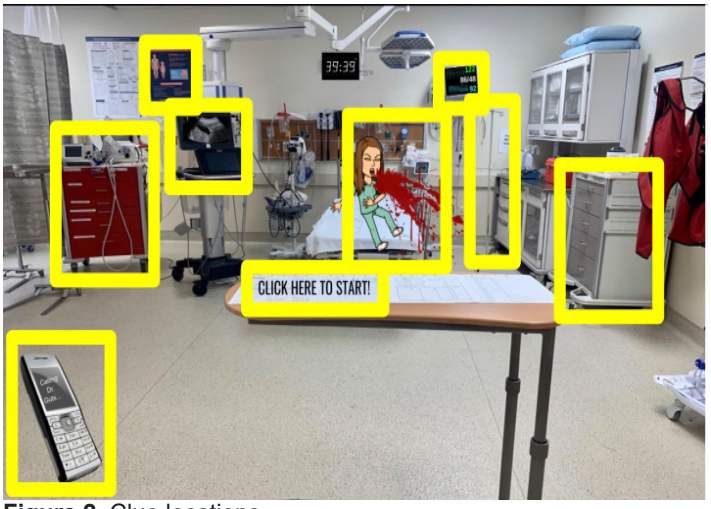

Figure 2. Clue locations.

Table.

What is your current level of training? PGY-	Did the Escape Room encourage you to work together as a team?	Should Escape Rooms like this be used to enhance resident wellness?	Did the Escape Room provide or reinforce medical education?	Please feel free to provide comments.	How can we improve the Escape Room experience?	Complete?
	Yes=1, No=2	Yes=1, No=2	Yes=1, No=2			
3	1	1	1		All residents should have the opportunity to participate in special simulation events like this. Enhances wellness, class bonding, team work	Yes
3	1	1	2	Too simple for ppy3-4	More difficult med content for ppy3-4	Yes
3	1	1	1		I thought it was a great experience	Yes
3	1	1	1		Organizing some of the boxes to correspond to specific patients or clues would be helpful. A little frustrating to have answers but not know how to use them/which box to use them on	Yes
3	1	1	1		Do more of these escape rooms, super fun! Had to work together, problem solve and think outside the box.	Yes
2	1	1	1		Nothing	Yes
2	1	1	1	So much fun and I felt I got to practice real medical skills and use knowledge. I honestly wish I could do one of these once/ week	Standardized sheets with information at the beginning like instructions , how many boxes, etc.	Yes
2	1	1	1		This was a great exercise. I would definitely be down to do another.	Yes
2	1	1	1		Standardized set of instructions prior to activity	Yes

26 Escape this Emergency Room: Simulation Education During a Pandemic

Nicole Elliott, DO; Michael Nguyen, MD; Julie Fritzges, DO; Louis Morolla, DO; Steven Johnson, DO; Tara Ortiz, CNA

Learning Objectives: To provide emergency medicine (EM) residents an educational activity that promotes teamwork and wellness. It includes cooperative problem solving, task-delegation, pride in team accomplishments, and recall of emergency medicine knowledge all while staying compliant with social distancing guidelines.

Abstract:

Background: Escape Room is a game in which participants solve puzzles in order to escape a room.The game engages participants' knowledge and problem-solving while also encouraging teamwork.In professional medical education, strategies that promote active learning are in demand.Activities like Escape Rooms can foster wellness among the residents based on overwhelming satisfaction from participants in previous studies.Furthermore, social distancing during the COVID-19 pandemic has limited the ability of residencies to gather large groups for didactics.The Escape Room format by its nature, provides an activity that requires fewer learners at a time to be present.Its implementation can foster wellness through social interaction while staying compliant with local public health guidelines.

Design: EM simulation faculty devised puzzles based on a mass casualty incident.The scenario presented EM residents with multiple simulated patients.Residents identified the solutions to the puzzles as they resuscitated patients, performed procedures, identified injuries, calculated medication doses and triaged arrivals.Prior to presenting a high-fidelity environment with manikins, procedural-trainers and locked-boxes, faculty piloted the scenario with low-cost elements like envelopes, pictures and index cards.This pilot defined the flow of the escape room and offered an alternative

FIgure 1.

table top version.The completed Escape Room was played by 3-5 residents in a large simulated resuscitation bay with 5 manikins (Figure). Afterwards, residents completed a survey assessing how well the activity promoted education, teamwork and wellness.

Effectiveness: In 2020, 19 residents divided into teams played the escape room in sequence. According to survey results (Table 1), they answered yes regarding the activity's promotion of education, teamwork and wellness. Respondents commonly asked for more. In practice,Escape Room can be an effective social and educational tool during a pandemic.

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

Kristy Schwartz, MD; Nicolas Kahl, MD; Leslie C. Oyama, MD

Learning Objectives: To reinforce Emergency Medicine knowledge and professional skills in a fun, team-based, "escape room" style game. Options were available for medical students and residents.

Abstract:

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.

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, more emphasis on functional communication, and a virtual option.

28 Foundations III: A Shared, Open Access Emergency Medicine Senior Resident Curriculum

Natasha Wheaton; Jaime Jordan, MD, MAEd; Paul Logan Weygandt, MD, MPH; Kristen Grabow Moore, MD, MEd

Learning Objectives: We developed Foundations III (F3) to offer a comprehensive open-access curriculum that exposes advanced emergency medicine learners to complex content including critical care, care of vulnerable populations, personal and professional development.

Abstract:

Introduction: Best practices in education recommend incorporating level-specific content to didactics. The Foundations of Emergency Medicine (FoEM) I and II courses have been widely adopted and offer targeted content for junior learners. However, programs have limited shared curricular resources that challenge senior residents and incorporate non medical knowledge based skills to prepare residents for independent practice.

C**urricular Design**: Foundations leadership created a comprehensive list of potential topics based on the EM Model, existing Foundations content, and personal experience. Final course topics (Table 1) were chosen by incorporating feedback from existing Foundations site leaders and additional expert educators. Next, we recruited forty content experts including EM and non-EM physicians as well as non-physicians. The pedagogy of each session was decided by the primary author in consultation with the course directors. Sessions employ a clinically-relevant, discussion based format with a focus on experiential learning. Vetted asynchronous content is available for review before or after sessions. In addition, each session includes an instructor guide to prepare non-expert faculty to facilitate.

Impact: The F3 curriculum includes 500 pages of original expert content and was successfully implemented for use by over 2,500 learners. Responses from an online evaluative survey show 90.6% of faculty site leaders strongly agree/agree that F3 adds value to their residency's educational program and 82.3% of learners strongly agree/agree F3 adds value to their education. 74.8% of learners agreed/strongly agreed that F3 helped prepare them for independent practice. Learners identified many topics as most valuable including billing and coding, ethics, and critical care; several identified "all of them" as highest value.

Future Directions: The F3 course directors plan iterative revisions of the curriculum based on annual learner/leader feedback.

Table. Foundations III course topics.

Critical Care	Acute RV Failure
	Unstable Intubations
	The Critically Ill Vented Patient
	Cardiogenic Shock (LV)
	Advanced ACLS
Clinical Skills	Workplace Violence and Disaster Management
	Rural EM and EMTALA
	Patient Centered Communication and Breaking Bad News
	Pediatric MAT and Guardianship
Non-Clinical Skills	Team Leadership and Conflict Resolution
	Residents as Teachers
	Billing and Efficient Documentation, Handoffs
	Bias in Medicine
Ethics	AMA and Capacity
	End of Life Care and Surrogacy
Personal Development	Physician Wellness I (Burnout, Resilience and Mindfulness)
	Physician Mental Health Emergencies
	The Job Hunt I (Practice Environments, CV and cover letters)
	The Job Hunt II (Interviews and Contracts)
	Personal Finance I (Saving, Investing, Buying)
	Personal Finance II (Insurance and Student Loans)
	Physician Errors and Second Victim

29 Holistic Review and #Match2021: Aligning Screening with Institutional Mission, Vision, and Values

Al'ai Alvarez; Holly Caretta-Weyer, MD, MHPE; Moises Gallegos, MD, MPH; Jennifer Kanapicki, MD; Ashley Rider, MD; Luz Silverio, MD; Alfredo Urdaneta, MD; Bianca Velasquez; Tamara Washington, MD; Sara Krzyzaniak, MD

Learning Objectives: To develop and assess the feasibility of a structured residency interview selection process that intentionally aligns with the department's mission, vision, and values for a more authentic holistic application review aimed toward advancing diversity, equity, and inclusion in residency recruitment.

Abstract:

Introduction: Bias has persistent downstream effects on residency recruitment and applicant selection. The COVID-19 pandemic has contributed to disparities by reducing access to away rotations and, therefore, electronic standardized letters of evaluations (eSLOEs). It has also affected applicants without home emergency medicine (EM) programs, many of which are also Historically Black Colleges and Universities (HBCU). EM programs review an average of 969 applications annually, limiting the ability to perform a holistic review of each application. Many programs use bottleneck criteria such as the United States Medical Licensing Examinations (USMLE) Steps 1 and 2 scores, which further introduce bias. Currently, there is no agreed-upon standardized approach to holistic review.

Design: The Stanford EM Residency Program leadership reviewed its application screening metrics and used available evidence regarding bias. The group reallocated each metric's weight accordingly, including USMLE Step 1 as Pass/Fail. AOA membership status no longer confers additional points, as its selection criteria are heterogeneous and have been shown to have a racial bias. HBCU applicants receive added points commensurate with applicants from the top 25 schools for research or primary care. The group developed specific criteria allocating points for alignment with published departmental mission, vision, and values (MVV): success or sustained effort in the domains of innovation, research, service, leadership, and advocacy.

Effectiveness: A structured screening process that eschews test scores and other traditional metrics for factors aligned with the department's MVV provides a blueprint for authentic holistic review while mitigating bias. By implementing this process, the interview offers for underrepresented students in medicine increased from 14.8% last year to 26.1% this year without impacting the application review's duration and intensity, indicating our process is feasible and acceptable.

30 How a Social Justice Curriculum is Impacting the Next Generation of Emergency Medicine Professionals - The University of Vermont Experience

Nikkole Turgeon, BS; Anna Corbalan, BS; Michael Lawler, BS; Naira Gouskasian, BS; Katie Wells, MD, MPH

Learning Objectives: To train the next generation of emergency medicine professionals to be better prepared to advocate for more culturally informed, inclusive care when working with diverse communities.

Abstract:

Background: There is ample evidence demonstrating health disparities in historically excluded communities. The Division of Emergency Medicine at the University of Vermont (UVMEM) has developed a curriculum focusing on the inequities impacting the health of the surrounding community. By increasing cultural competency of UVMEM, we aim to improve the health outcomes of marginalized populations, specifically by encouraging their direct participation in the curriculum. Educational Objectives: Residents and medical students will: 1. Foster more equitable and collaborative. partnerships with local communities. 2. Screen patients for social determinants of health (SDH) and identify potential risk factors and barriers to care. 3. Advocate for culturally informed health care within diverse constituencies. Curricular Design: Over the course of six months UVMEM developed a curriculum with the central pillar of creating curricular content directly informed by community needs. A multidisciplinary team of healthcare professionals identified educational gaps and developed trusting relationships with community partners. There are five working groups curating

culturally informed content: anti-racism, gender inequities, LGTBQ+ issues, new Americans, and the non-domiciled population. The content is divided among four 1-hour didactic sessions and two months of journal club. Impact: The initiative has been well received by community partners and is garnering interest from other divisions. The curriculum is being integrated into the Larner College of Medicine's longitudinal social medicine curriculum allowing for students to engage with this material from the inception of their medical training. Residents and medical students are learning to be leaders who support collaborative practices as well as the importance of respecting and understanding unique cultural differences when working with diverse communities. Other institutions, even on an international level, can utilize this model.

31 Implementation of a Monthly Individualized Learning Plan with Emergency Medicine Residents

Leila Getto, MD; Joshua Drake, MD; Alyssa Young, RN; Jenna Fredette, MD

Learning Objectives: We describe a pilot study to create and assess an ILP program for a group of PGY1 EM residents. We explore development in self-assessment skills, goal generation as well as gauge attitudes towards the program.

Abstract:

Introduction/Background: Self-assessment and self-directed learning are integral to developing competent physicians who are lifelong learners. Individualized learning plans (ILPs) are tools to formalize this process and allow for mentors to guide residents in developing these skills. Pediatric residencies have adopted the ILP process and have demonstrated improvement in resident self-directed learning behavior, but to date there have been no EM residencies to adopt the ILP process into resident education.

Educational Objectives: We describe a pilot study to create and assess an ILP program for a group of PGY1 EM residents. We explore development in self-assessment skills, goal generation as well as gauge attitudes towards the program.

Curricular Design: The ILP program was designed around three key elements: 1) resident performance of self-assessment, 2) a collaborative conversation about learning needs and goals and 3) a shared development of implementation strategies. The program was implemented with 12 PGY1 EM residents in the 2019 academic year. Following an introduction to ILPs during orientation, residents met monthly with program leadership to create and reflect on ILPs. At the conclusion of the academic year, residents were surveyed about their attitude toward the ILP process and self-directed learning.

Impact/Effectiveness: A total of 9 residents completed the post implementation survey. Prior to implementing the ILP program, residents universally reported that they had little to no experience with generating an ILP. Following implementation, 55% of residents described themselves as strong independent learners and 89% wanted to continue the program into their second year. Overall, residents felt that the ILP program helped to focus their goals, monitor their progress, and allowed them to develop a relationship with program leadership. One barrier identified was the logistics of scheduling around busy faculty and resident schedules.

32 In Situ Interprofessional Pediatric Simulation Study in the Emergency Department

Lynn McGowan, DO; Jessica Riley, MD; Lorie Piccoli, MD; Duane Patterson, PhD

Learning Objectives: Improve medical knowledge of emergency department (ED) staff pertaining to critical pediatric emergencies

Improve crew-resource management skills among staff by implementing educational interventions in the clinical environment

Familiarize staff with pediatric resources in a community, academic ED

Abstract:

An educational collaboration among multiple departments, termed interprofessional education is essential to deliver the most efficient, safe and advanced patient care within an Emergency Department (ED). New protocols and technologies are essential to compensate for increasing patient volume and acuity. Without support, even innovative solutions may propagate knowledge gaps and miscommunication that can be detrimental to patient care, especially among pediatric resuscitations.

A monthly in situ pediatric simulation study, which emulated five common pediatric pathologies, was initiated at Wellspan York Hospital, a community, academic center. Simulations involved an attending physician, resident physician, two nurses, and when appropriate, the pharmacy, respiratory therapy, and neonatal intensive care unit teams. A pediatric, high fidelity model with correlating resuscitation equipment was stationed in the ED. Each case lasted 20 minutes followed by a 10 minute debrief to review closed loop communication, clinical knowledge and protocols. An anonymous electronic survey was completed within one week to assess the simulations.

Over 75 personnel have been enrolled and completed at least one simulation, of which 40 completed the electronic survey (53%). These participants (100%) reported that the exercise was beneficial and should be maintained as a core element of continuing education. On a scale from 1-10, participants felt that the simulation mimicked a true patient encounter with an average score of 7.6. Finally, self-reported competency with medical knowledge and communication before and after showed

an increase of 18%. Qualitative feedback was valuable to suggest learning modalities, including different simulation equipment, alteration of team dynamics and other improvement projects. Results suggest that simulation modalities should be utilized to optimize multiple aspects of pediatric resuscitations in the ED.

33 In-Person to Remote Transition of the New York University Emergency Medicine Underrepresented in Medicine Fellowship During the COVID-19 Pandemic

Yue Jay Lin, MD; Janelle Lambert, MD; Mukul Ramakrishnan, MD; Masashi Rotte, MD; May Li, MD; Audrey Bree Tse, MD

Learning Objectives:

1. Provide a virtual learning experience showcasing EM for pre-clinical URM medical students with no prior EM exposure.
2. Guide students through a scholarly presentation exploring basic study design in EM specific topics.
3. Provide individualized mentorship with URM EM residents and faculty.

Abstract:

The EM Department at NYU Langone hosts a month-long fully funded summer fellowship for rising second year underrepresented in medicine (URM) students from medical schools across the country. During the COVID-19 pandemic, our fellowship transitioned to remote learning to limit disease transmission.

Learning objectives typically taught via in-person workshops and clinical shifts were presented in virtual presentations and interactive demonstrations. Equipment such as suture kits, splinting supplies, and wilderness medicine gear was mailed to students prior to the start date. Google classroom, Zoom, and Webex were used to facilitate the online classroom. 15 faculty and 8 residents participated through workshops, didactics, panel discussions, journal clubs, 1:1 mentoring, and Q&A sessions. Each student worked on a scholarly project throughout with their resident and faculty mentor and then presented it on the last day. The focus of the scholarly project was changed from a clinical focus to a social medicine issue in the students' local communities.

We hosted 4 visiting URM students and 2 NYU students. The curriculum was rated from 0 to 10, with resident didactics (7) rated 8.17 (SD 1.91), faculty lectures (15) rated 8.05 (SD 2.20), resident simulation workshops (2) rated 8.75 (SD 1.60), and resident procedural workshops (2) rated 8.58 (SD 1.96). Every participant reported that they are more likely to pursue EM after the fellowship compared to before. This successful transition to a virtual classroom is a viable option to consider for programs seeking to continue education while reducing risk of disease transmission.

34 Integrating POCUS Education With Critical Care in the Era of Distance Learning

Matthew VandeHei, MD; Molly Thiessen, MD; Manuel Montaño, MD; Matthew Riscinti, MD

Learning Objectives: Teach the use of POCUS in critically ill patients with respect to image acquisition, image interpretation, and clinical decision-making in the setting of distance learning.

Abstract:

Introduction: Point-of-care ultrasound (POCUS) is integral to Emergency Medicine Residency training and often a fundamental component of a senior medical student EM rotation. The Covid-19 pandemic has dramatically limited in-person instruction and necessitated innovative methods of ultrasound education. Using video-conferencing software, we created a novel simulation experience that integrates POCUS into the core EM content delivery of a virtual EM sub-internship.

Curricular Design: Following a brief didactic session, a group of 20 sub-interns was divided into 5 "breakout rooms," each with 1 resident facilitator. The students then progressed through 4 critical care cases in slide format. For each case, students were able to choose from a variety of diagnostic and therapeutic options, and when the students selected POCUS, they then chose both the order and anatomic region of the scans. Images of normal and abnormal findings were provided in GIF format as they pertained to the given case. After verbalizing and interpreting the findings, students could then perform additional scans or interventions until the patient was stabilized. Following the initial session, some ambiguity was added to the vignettes to increase the number of scans typically performed prior to intervening.

Impact/Effectiveness: Based on post-session feedback, students felt this approach was highly effective in helping interpret POCUS images and apply the information to a clinical scenario. Mean Likert scale feedback on organization, applicability to clinical practice, and effectiveness was 4.92 out of 5 for each of the categories based on 25 total responses. Written feedback revealed students would have preferred less didactic time and more time with cases. Qualitatively, this feedback did not notably differ from similar in-person sessions held previously. Similar approaches could be used to teach these skills to providers of all levels from the next room or a location across the world.

35 Ischemic ECG Pattern Recognition to Facilitate Interpretation While Task-switching: A Parallel Curriculum

Caitlin Schrepel, MD; Ashley Amick, MD, MS; Madeline Sayed, BA; Anne K. Chipman, MD, MS

Learning Objectives: Educational Objective: By the end of this course, all learners will have increased confidence and

accuracy in identifying which ECGs require immediate cath lab activation while task switching from a parallel activity.

Abstract:

Introduction: Managing interruptions is a critical skill for emergency physicians (EPs). EP's activities are often interrupted for other concurrent clinical responsibilities, such as emergent electrocardiogram (ECG) interpretations. These interruptions can increase cognitive load and precipitate medical error. EPs learn to balance these responsibilities using a process called task switching. Task switching is a skill that requires practice to master, yet EPs have little exposure to exercises that purposefully integrate task switching during their training. We aimed to address this gap by exposing trainees to task switching events in the form of critical ECG interpretation while they were engaging in concurrent bootcamp activities. Curricular Design: The curriculum was carried out in 2 phases. First, 12 PGY2 residents engaged in a small group session that tested their baseline confidence and ECG interpretation skills on 20 ECGs representing critical cardiac conditions as well as normal variants. The learners assessed each ECG as either "no activation", "activate cath lab", or "no activation but immediate cardiology consultation." The group then reviewed the correct interpretations and critical diagnostic elements of the 20 ECGs. The second phase of the curriculum was longitudinal. During concurrent bootcamp activities study investigators (acting as medical assistants) interrupted tasks and requested the trainees interpret the same 20 ECGs when presented in random order in 10 seconds or less. Confidence as well as percentage of correct interpretations were compared from phase 1 to phase 2. Impact/Effectiveness: Participants showed improved confidence (2.46±0.59 to 2.93±0.60; p=.021; 5-point Likert scale) and increased mean percent correct (0.68±0.11 to 0.79±0.12; p=0.009) following the curriculum. Our curriculum provides a pragmatic, reproducible approach to enhancing critical ECG interpretation with task switching in a way that mirrors the EM practice-environment.

36 Mitigating Interview Day Bias: Pre-Defining Merit to Create Standardized Targeted Questions

Kamna Balhara, MD; Logan Weygandt, MD, MPH; Michael Ehmann, MD, MPH, MS; Linda Regan, MD, MEd

Learning Objectives:

1) Mitigate impacts of bias by defining merit before residency interview season

2) Create behaviorally-based questions addressing those areas of merit

3) Implement questions in a standardized manner for each interviewee

Abstract:

Introduction: Residency interviews are uniquely susceptible to bias. Best practices for equitable interviewing exist in cognitive psychology and corporate literature, yet are rarely implemented in residency interviews. Fewer than 5-22% of residency programs use standardized questions, though this is a known best practice. We describe how we defined merit prior to interview day and created standardized, scale-scored questions addressing those areas of merit.

Educational Objectives: Mitigate impacts of bias by defining merit before interview season;

Create behaviorally-based questions addressing those areas of merit;

Implement questions in a standardized manner for each interviewee.

Curricular Design: Pre-defining merit has been shown to mitigate effects of bias on hiring. Before the 2019-20 interview season, we convened key stakeholders (residency leadership, program staff, faculty, residents) to pre-define merit, specifically the values our program embodies and the characteristics our most successful residents possess. Next, we searched the corporate/cognitive psychology literature to identify behaviorally-based interview questions related to three key characteristics, and applied anchor-based rating scales for responses. Interviewers were trained to ask one of the three questions during each interview and immediately complete the rubric to ensure reliability. We considered standardized question performance during applicant ranking.

Impact/Effectiveness: Merit-based standardized questions represent a low-cost intervention that can be easily implemented at any training program. Interviewers responded positively to our intervention and indicated that it revealed unexpected insights and changed their initial perceptions of applicants. Review of interviewee feedback revealed no significant negative impressions of the standardized questions. This intervention represents a simple step programs can take towards building an inclusive workforce.

37 Novel Medical Student Basic Ultrasound Curriculum

Diandra Escamilla, MD; Sean Burns, MD; Laura Welsh, MD; Kelly Mayo, MD

Learning Objectives: Most students reported not having prior introduction to ultrasound before their ED rotation. Our objectives were for learners to be introduced to the basics of ultrasound, knobology, basic ultrasound physics, and image acquisition prior to their rotation in a virtual based format.

Abstract:

Introduction/Background: As ultrasound becomes increasingly used in different medical specialties, ultrasound training is increasingly incorporated into undergraduate medical education. However, much of the published curricula focus on specific applications. We

are unaware of any published curricula dedicated to basic ultrasound skills.

Educational Objectives: Our objectives were for learners to be able to define necessary terms in ultrasound probe manipulation, identify the correct probe for image acquisition, describe common artifacts encountered in ultrasound and explain the common ultrasound modes.

Curricular Design: We created a two-part curriculum for third year medical students on their EM selective. The module consisted of a 20-minute introductory video shared with the students prior to their orientation start date. We designed a 15-question quiz through Kahoot to incorporate active learning and retrieval practice. Video content was based on the ACEP policy on ultrasound education and expert consensus from ultrasound and education EM faculty. This curriculum was implemented three times with iterative changes made based on learner feedback. After the final curriculum was implemented, a post-survey was then sent out at the end of their rotation to receive feedback on the effectiveness and utility of the project.

Impact/Effectiveness: Qualitative data thus far suggests the students strongly agreed that ultrasound teaching would be useful in their future residencies and that they wished they were introduced to it earlier in their rotation. 62% of students found the virtual based format "very useful" in introducing them to clinical ultrasound. 62% of student also found the quiz to be "very useful" in cementing their ultrasound knowledge. Students on the rotation felt more comfortable ultrasounding their patients on shift and reviewing the images with residents after watching the video.

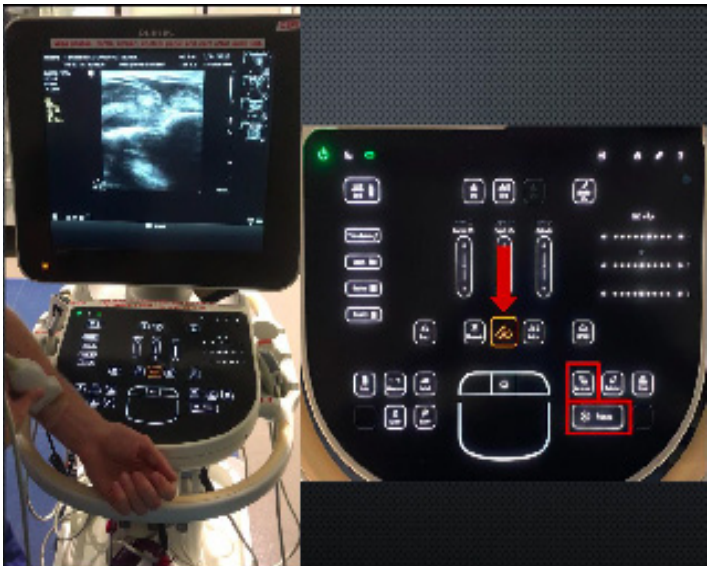

Image 1. Image captured from Ultrasound Basics Training video (available at https://youtu.be/ppvv6y1tsF4) which demonstrates how to acquire images on the machine.

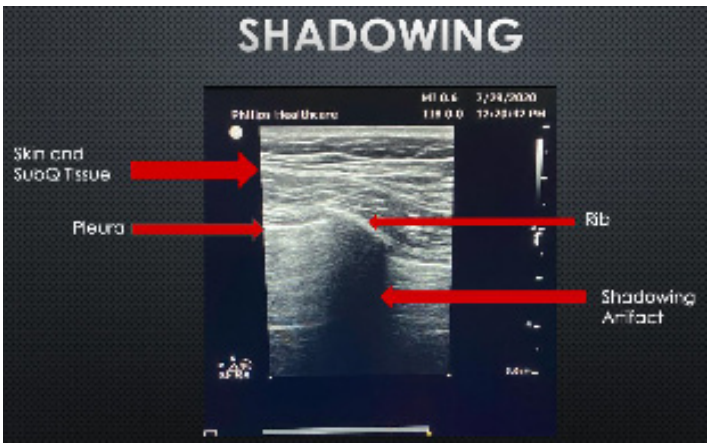

Image 2. Image captured from Ultrasound Basics Training video (available at https://youtu.be/ppvv6y1tsF4) discussing common artifacts encountered in ultrasound.

38 Opioid Use Disorder Tabletop Simulation: An Immersion Experience to Increase Empathy and Awareness of Stigma

Lauren Walter, MD; Jennifer Hess, MD; Michelle Brown, PhD, MS, MLS(ASCP) SBB; William Opoku-Agyeman, PhD

Learning Objectives:

1)Demonstrate feasibility and acceptability of OUD education via delivery of an 'opioid tabletop simulation.'

2)Improve awareness of stigma and increase empathy for OUD patients.

Abstract:

As a subspecialty, Emergency Medicine (EM) is increasingly faced with addressing the needs of patients presenting with Opioid Use Disorder (OUD). However, most EM physicians remain inadequately prepared to identify and manage this population – the opioid epidemic has outpaced EM residency education, resulting in a critical gap. An additional disease-specific hurdle involves acknowledging stigma and practicing with empathy toward a traditionally stigmatized patient group. Creating 'OUD competent' and sensitive EM physicians will require incorporating OUD-specific training into EM residency.

Curricular Design: A 2-hour immersive OUD Tabletop Simulation was delivered to 18 EM residents and faculty as part of a comprehensive OUD didactic. The simulation is an experiential tool which helps learners understand that OUD is a chronic disease for which there is treatment and recovery. Participants are taught how stigma and resiliency can impact people with OUD. Presented in a board-game-like format, the simulation personalizes the experience for participants who are asked to simulate navigating life with addiction, be a healthcare provider responsible for

making choices in a resource-limited environment, or be a clinician providing care for people in active addiction and in recovery.

Participants were evaluated via the Perceived Stigma of Addiction Scale (PSAS), an 8-item scale intended to measure perceived stigma toward substance misuse, immediately prior and subsequent to the intervention. General course feedback was also solicited.

Impact/Effectiveness: 18 participants, including 15 EM residents, completed the simulation and pre/post PSAS. Post-scores were significantly lower, indicating decreased prevalence of stigmatizing beliefs toward substance use ($p<.05$). All respondents providing course feedback felt the simulation was a meaningful component of the didactic. The simulation increased awareness of the prevalence of stigmatizing attitudes and actions in OUD.

39 PEM for EM: A Novel Pediatric Emergency Medicine Curriculum

Kristy Schwartz,MD; Melissa Krautwald, N/A; Leslie C. Oyama, MD; Michele McDaniel, MD

Learning Objectives:

Design a comprehensive, interactive pediatric emergency medicine curriculum that is translatable to any Emergency Medicine (EM) residency.

Abstract:

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.

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 a statistically significant increase in confidence level ($p<0.005$, see Figure) 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, and is in the process of modifications for virtual conferences.

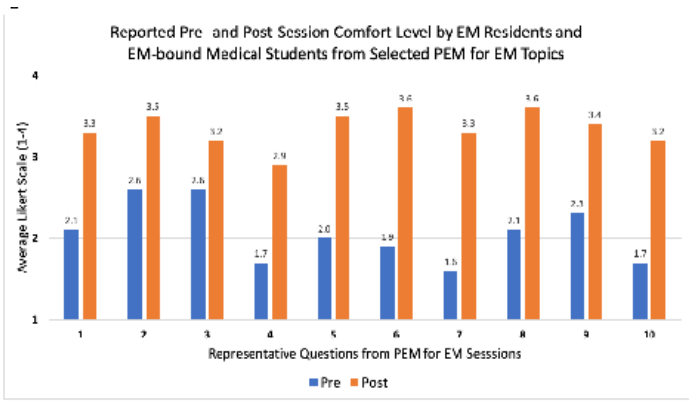

Figure.

40 PennEM Fit Tested: Moving Together Towards Wellness During the Surge...an Innovative Wellness Initiative

Amanda Deutsch, MD; Kaytlena Stillman, MD, MPH; Seth Merker, MD; Katherine Brodie, MD; Gillian Bach, MD; Kevin Scott, MD, MSEd

Learning Objectives: We implemented a four-week residency physical activity challenge during the first COVID-19 surge in order to:

1.Encourage regular physical activity
2.Increase a sense of community
3.Improve overall wellness

Abstract:

Introducdtion: Approximately 46-60% of trainees experience symptoms of burnout. Emergency medicine is a particularly high-risk specialty for burnout, with the COVID-19 pandemic exacerbating certain contributing characteristics. Social distancing has contributed to feelings of isolation as well. Participating in 150 minutes of activity per week is ideal for overall health with regular physical activity providing other psychological and social benefits. Encouraging regular physical activity may promote resident wellness.

Objectives: We implemented a residency physical activity challenge during the first COVID-19 surge in order to:

1.Encourage regular physical activity

2.Increase a sense of community

3.Improve overall wellness

Design: Participation was opt-in. Residents created a Strava account and joined the club, PennEM Fit Tested. During the challenge, points were given for each day a resident participated in 30 minutes of activity. Those posting five days of activity in a week were eligible for weekly prizes. At the end of the challenge, residents with the most active days overall and in each class won an award. Prizes were also given for creative pictures and activity titles. Residents had the opportunity to provide "kudos" and post comments on each other's activities. At the conclusion of the challenge, participants were asked to complete a survey to better understand impact.

Impact: 28 residents participated in the challenge. Our response rate was 89.3% (n=25) with 76% (n=19) identifying as being more physically active as a result of the challenge. 92% (n=23) identified the challenge as fostering a personal sense of community with 92% (n=23) stating the challenge improved their overall wellness. Physical activity challenges can promote a sense of community and positively impact the overall wellness of residents. Similar challenges can easily be implemented at other programs. Future iterations will focus on increasing participation and teamwork.

41 Pushing the R.E.S.E.T. Button: Hot Debriefing Curriculum for Emergency Medicine Residents

Megan Gillespie, MD; Mohamad Moussa, MD; Ramin Tabatabai, MD; Adam R. Kellogg, MD

Learning Objectives: This developed curriculum focuses on educating EM residents about hot debriefing as well as providing resources to train these residents to be effective hot debriefing leaders.

Abstract:

Emergency medicine (EM) residents experience critical incidents (CIs), such as cardiopulmonary arrests, pediatric resuscitations, or severe traumatic injuries, routinely in clinical practice. It is often difficult for EM residents to reset after emotionally intense CIs and resume routine clinical responsibilities. Residency training provides EM resident physicians the skills needed to medically manage patients of CIs, however, residency training rarely provides formal training on how the resident can manage themselves and their team immediately after CIs. This developed curriculum focuses on educating EM residents about hot debriefing as well as providing resources to train these residents to be effective hot debriefing leaders.

Repeat exposures to CIs can cause emergency providers to experience burnout, compassion fatigue, low compassion satisfaction, an inability to cope, and secondary traumatic stress. Debriefing has supportive evidence for improved patient outcomes, team morale, and personal resiliency as benefits. Despite these benefits, debriefing infrequently occurs in real time in the emergency department. Two of the most noted perceived barriers to performing debriefing is lack of time and lack of training for effective facilitators.

Hot debriefing, an abbreviated post-event debriefing occurring within minutes to hours after a CI so that all members who were involved can participate, is a practical debriefing methodology for emergency clinicians. This developed and implemented original curriculum provides residents with education about how to be an effective hot debriefing facilitator based on the framework of emotional intelligence and Mitchell's 7-Step Model of Critical Incident Stress. This hot debriefing curriculum for residents to help them reset after CIs is summarized by the mnemonic R.E.S.E.T., which stands for:

Recognizing the critical incident;

Emotional self-awareness;

Self debrief;

Empathy towards others' emotions;

Team hot debrief.

42 Rapid Development and Implementation of a Public Health Elective during the Covid-19 Pandemic

Therese Mead, DO, FACEP; David Hansen, DO; Kathleen Cowling, MS, DO, MBA, FAAEM, FACEP; Derek Schaller, MD, FACEP; Bethany Figg, MBA, MLIS, C-TAGME, AHIP

Learning Objectives: The objectives of this elective were to: identify acute public health issues and utilize different media formats to educate the public on current community health concerns.

Abstract:

Background: In early 2020, a number of emergency medicine residency programs temporarily removed resident physicians from nonessential clinical duties in order to limit exposure to Covid-19. In our institution, a public health elective focusing on emergency preparedness was developed to provide a structured learning experience for those displaced residents. Educational Objectives: The objective of this curriculum was to develop an elective to allow residents to gain timely knowledge to identify acute public health issues, discuss with faculty mentors, and synthesize available data to deliver a public health project. Curricular Design: A 4-week curriculum was designed for residents at a community academic institution. The curricular design included daily online briefings, a topic of the day, targeted readings, and asynchronous project work with colleagues and community partners. Thirteen residents from five specialties participated in this elective from March to April 2020. After each week, opportunities for fine-tuning the

elective were discussed in the group debrief. A post-elective survey was sent to all participants to assess their perceptions of the elective experience. Impact/Effectiveness: Over 20 projects were completed including: educational infographics for the community, design of a lung ultrasound protocol for a local ED, broadcasting of a commercial for a local cable station, a pandemic simulation case series, and development of frequently asked questions regarding Covid-19 for pregnant patients. In the post-rotation evaluation, 12/13 (92.3%) participants answered the question "How satisfied are you with the Population Health elective?" with either "Very Satisfied" or "Satisfied." This elective rotation, although designed out of necessity, turned out to be one of the most productive elective experiences to date at our institution and could be adopted by other institutions needing to work while maintaining social distancing.

43 Resuscitation Leadership Training for Emergency Medicine Residents

Rachel Gartland, MD; Lauren Conlon, MD; Michael Abboud, MD MSEd

Learning Objectives:

Emergency medicine residents must learn to lead teams in high-acuity dynamic situations, but most do not undergo formal leadership training. We developed a simulation course to teach leadership and communication skills using resuscitation scenarios and the tenets of crisis resource management.

Abstract:

Introduction: The ability to lead and communicate effectively with team members in dynamic, high-stress situations is expected of graduating EM residents. Nevertheless, most residents do not undergo formal leadership training, instead learning these skills by observing senior residents and attendings before being thrust into the team leader role themselves.

Educational Objectives: We seek to develop a training course to teach leadership and communication skills to junior residents. The goal of this curriculum is to facilitate the transition from junior to senior resident by improving team skills that are often difficult to teach but imperative to the growth of emergency medicine physicians.

Curricular Design: We developed a curriculum called Resuscitation Leadership Training, using high-fidelity simulation and the tenets of crisis resource management to improve the leadership skills of junior EM residents, specifically with critical care scenarios. We used the TeamSTEPPS framework to teach leadership and teamwork, using a combination of didactic learning, simulation cases, and deliberate practice to hone these skills. We intentionally created simulation cases that involved critically ill patients, as these require the leading senior resident or attending to coordinate with a larger medical team in dynamic situations. We anticipated that participation would specifically improve residents' comfort in leading resuscitations and their ability to communicate effectively with their team. We also anticipated that after completing this curriculum, residents would feel more comfortable with the medical management of similar critical patient cases.

Impact: This curriculum was well received by residents and considered highly effective. Survey data of participating residents showed statistically significant improvements in their self-perception of leadership and communication skills, as well as comfort in managing patients with the presentations they were tasked with.

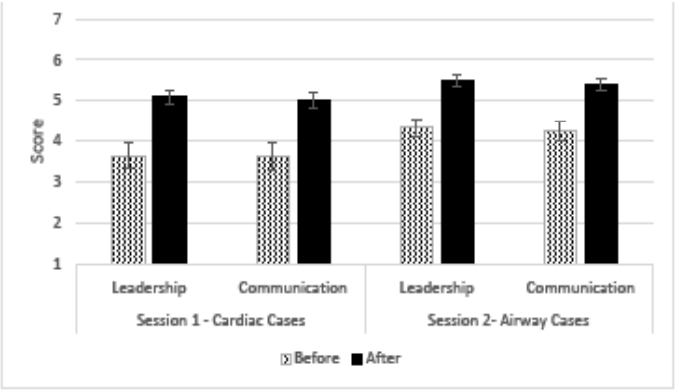

Figure 1. Leadership and communication survey results from both sessions. Residents were asked after each session to rate how ready they felt to lead a resuscitation before and after completing the course, where 1 = not at all ready and 7 = very ready; the mean scores and standard errors are listed here under "Leadership." Residents were also asked after each session to rate how effective their communication skills were before and after completing RLT, where 1 = not at all effective and 7 = very effective; the mean scores and standard errors are listed for each session under "Communication."

Table 1. Case-specific survey results.

Case		Mean Comfort Score	Standard Error	Standard Deviation	95% Confidence Interval	t-score (p-value)
STEMI	before	4.55	0.31	1.04	3.85 - 5.24	6.53 (p<0.01)
	after	5.82	0.23	0.75	5.31 - 6.32	
PE	before	4.36	0.41	1.36	3.45 - 5.28	5.16 (p<0.01)
	after	5.82	0.30	0.98	5.16 - 6.48	
WCT	before	3.55	0.25	0.82	2.99 - 4.10	8.03 (p<0.01)
	after	5.36	0.28	0.92	4.74 - 5.98	
Flash	before	4.82	0.35	1.17	4.03 - 5.60	4.08 (p<0.01)
	after	5.86	0.27	0.90	5.26 - 6.47	
Shock	before	5.50	0.19	0.67	5.07 - 5.93	5.74 (p<0.01)
	after	6.25	0.18	0.62	5.86 - 6.64	
Asthma	before	3.83	0.24	0.83	3.30 - 4.36	9.95 (p<0.01)
	after	5.33	0.14	0.49	5.02 - 5.65	
ICH	before	4.50	0.23	0.80	3.99 - 5.01	7.00 (p<0.01)
	after	5.67	0.14	0.49	5.35 - 5.98	
ARDS	before	3.58	0.29	1.00	2.95 - 4.22	6.09 (p<0.01)
	after	5.17	0.17	0.58	4.80 - 5.53	

Residents were asked to rate their comfort managing each case before and after completing RLT, where 1 = not comfortable and 7 = comfortable. The mean scores for each response are recorded with the standard errors, standard deviations. The t-scores were calculated using paired samples t-tests with significance assumed at a 95% confidence interval.

STEMI, St-elevation myocardial infarction; *PE,* pulmonary embolism; *WCT,* wide complex tachycardia; *Flash,* flash pulmonary edema; *Shock,* septic shock; *asthma,* asthma exacerbation; *ICH,* intracranial hemorrhage; *ARDS*, acute respiratory syndrome.

44 Resuscitation Leadership: An Introductory Curriculum for the 4th Year Medical Student

Derek Schaller, MD FACEP; Chris Trumph, DO; Jade Foldie, BS

Learning Objectives: This curriculum aims to increase student comfort in the resuscitation environment by arming them with the following key skills: (1) organize a resuscitation team; (2) demonstrate effective closed-loop communication; (3) debrief effectively to promote improvement in individual and team performance.

Abstract:

Introduction: Many medical students do not have the opportunity to build resuscitative leadership skills until residency. Informal polling of 4th year medical students rotating through the Emergency Medicine (EM) clerkship at our institution found that students felt unprepared to participate in medical and trauma resuscitation scenarios. This curriculum was designed to improve awareness and basic skills in resuscitation environments so that students feel confident and comfortable participating and contributing in medical and trauma code scenarios.

Objectives: At the conclusion of the course, students will be able to: (1) organize a resuscitation team and delegate roles; (2) practice standard of care; (3) demonstrate effective closed-loop communication; (4) debrief to evaluate team performance and individual leadership effectiveness.

Design: The course consists of three sessions: an introductory simulation day with two team-based resuscitation simulations, one medical and one trauma code. The second is a two-part lecture series and the third is a simulation day with two rigorous high-fidelity scenarios during which team performance is assessed. Each of these sessions is preceded by an asynchronous learning assignment and each simulation case is debriefed formally. At the conclusion of the course, extensive video debriefing and discussion occurs as well. Pre- and post-course surveys are completed by students to assess perceived readiness and knowledge gained in resuscitation environments.

Impact: Course effectiveness was studied over 2.5 years of implementation. Students without and with prior training reported an increase in perceived readiness by 29% and 35% respectively. Furthermore, reported knowledge gained from the curriculum in managing resuscitations improved significantly. We believe that this curriculum can enhance the learning and leadership skills of students and prospective emergency medicine residents across the nation.

Figure.

Table 1. Curriculum overview: Content ouline and instructional objectives.

	Session 1: Introductory Simulation Case	Session 2: Bootcamp	Session 3: Practical Application
Prerequisite Assignment	Pre-course survey Handouts: 1. AAMC Survey Results 2. Jones F, Passos-Neto CE, Braguiroli OFM. Simulation in Medical Education: Brief history and methodology. PPOR 2015, Jul-Aug;1[2]:56-63 3. Cardiac Arrest Algorithm Handout (AHA 2015)	CDEM Curriculum Topics 1. Stabilization of the Acutely Ill Patient 2. Approach to Trauma 3. Basic and Advanced Life Support Techniques - Airway - Breathing - Circulation: Electricity - Cardiac Arrest	Flipped EM Classroom 1. Cardiac Arrest* 2. ACLS- Airway 3. Trauma *Note: based on 2010 guidelines
Objectives	1. Recall the order of operations required to manage a patient in Ventricular fibrillation per ACLS guidelines 2. Demonstrate closed loop communication 3. Delegate roles that optimize teamwork in a code scenario 4. Analyze the strengths and weaknesses of team performance in a simulated medical code	1. Describe the basic steps required in resuscitation of the cardiac arrest patient 2. Distinguish between the varying dysrhythmias and required treatment algorithms in the cardiac arrest patient 3. List the steps of the primary and secondary survey performed in management of the trauma patient 4. Propose critical interventions to positive findings identified in the trauma primary survey	1. Demonstrate effective teamwork and closed-loop communication 2. Evaluate, through self-reflection, the performance of one's own team in medical and trauma resuscitation scenarios 3. Arrange a medical or trauma team and delegate tasks appropriately to ensure effective resuscitation 4. Manage a cardiac arrest patient effectively after ROSC by determining post-resuscitation care and disposition
Classroom Methods	Informal Presentation Intro to SIM (15 min) Team-Based SIM Session High fidelity SIM case: ACS with cardiac arrest (15 min per group) Group Debrief (15 min)	Formal Presentations 1. ACLS Bootcamp (50 min) 2. ATLS Bootcamp (50 min) Group Discussion 10 min following each presentation topic	Team Based SIM Cases 1. ACLS Case w/ Debrief (30 min) 2. ATLS Case w/ Debrief (30 min) Group Discussion - Review/critique videos of SIM cases - Discuss nuances of resuscitation (60 min total)
Additional Resources	ER Cast Podcast 1. How to Run a Code 2. How to Master CPR	*Tintinalli's Emergency Medicine: A Comprehensive Study Guide*, 8th edition. • Ch 21- Sudden Cardiac Death • Ch 22- CPR • Ch 28- Non-invasive Airway Mgmt *Rosen's Emergency Medicine Concepts and Clinical Practice*, 7th Ed. • Ch 77- Dysrhythmias	Life in The Fast Lane 1. Cardiac Arrest 2. Trauma

Description of learners: M4 medical students on their core or elective emergency medicine rotation; duration 28 days. Learners will have varying intended specialties.

45 Resuscitation Practice, Testing, and Remediation for Junior EM Residents

Sonika Raj, MD; Jessica Hernandez, MD; Joseph Martinez, MD; Kavita Joshi, MD; Chrissy Chan, MD; Carlos Trigo, MD; Daniel Testa, MD; Zachary Aust, MD

Learning Objectives: The curriculum's objective was to put each resident through complex resuscitation simulations to assess medical knowledge, leadership skills, and readiness for the EM critical care environment.

Abstract:

Introduction/Background: Simulation is a vital component of EM resident education. Our PGY2 residents inherit the responsibility of leading our critical care/trauma pod. A curriculum was developed in response to this internal requirement.

Educational Objectives: The curriculum's objective was to put each resident through complex resuscitation simulations to assess medical knowledge, leadership skills, and readiness for the EM critical care environment.

Curricular Design: This curriculum consisted of 3 stages: formative, testing, and remediation. Each stage was designed to assess resuscitation competency through cases proctored by EM faculty. In the formative stage, the resident faced 4 cases of cardiac arrest, each due to different etiology. The resident was debriefed after each case. Testing sessions were held after formative sessions were complete. In the testing stage, the resident faced 2 cases (1 patient with undifferentiated shock and 1 with cardiac arrest) but was not told beforehand that there would be a second case. The resident began Case 1, and was interrupted halfway through by a call to Case 2. At the end of Case 2, he/she returned to Case 1. EM faculty scored the resident's performance per the objectives. The resident was debriefed and told if he/she required remediation. 5 residents were required to complete a remediation case consisting of a patient with hypoxic respiratory failure complicated by cardiac arrest. Residents were debriefed post-case in a summative fashion; all 5 passed. All residents then received feedback on their individual areas of weakness and resources to spur further study.

Impact/Effectiveness: The curriculum was administered to 22 residents. It proved to be a high-fidelity method of assessing junior EM resident resuscitation skills and remediating specific areas of weakness. Learners found it helpful to their growth and clinical skills. We plan to continue this for future residents while refining the cases and scoring system.

46 Rethinking the Away Rotation

Ryan Bodkin, MD; Julie Pasternack, MD; Linda Spillane, MD; Kathleen Stephanos, MD; Joseph Pereira, DO; Valerie Lou, DO; Jason Rotoli, MD

Learning Objectives: Through a virtual elective

1. Provide a remote virtual education opportunity for EM bound students during times of disruption

2. Demonstrate our academic mission, program strengths, and introduce a variety of faculty to prospective applicants

3.Recruit high-quality EM bound applicants

Abstract:

Background: Emergency Medicine (EM) applicants and residencies benefit from away rotations by giving applicants exposure to different program leadership, diverse clinical environments, and providing programs face-time with qualified interested applicants. COVID has suspended this practice. Through a virtual elective, we were able to convey our academic mission and cultivate an interest in our program for interview season.

Educational Objectives:

1.Provide a remote virtual education opportunity for EM bound students during times of disrupted clinical exposure

2.Demonstrate our academic mission, program strengths, and introduce a variety of faculty to prospective applicants

3.Recruit high-quality EM bound applicants

Curricular Design: We met the disruption with a virtual 1-week clerkship designed as an away elective for visiting students. The content was developed based on feedback from institutional education experts and a literature review of the implementation of a virtual classroom. Each day consisted of small group case-based didactics, virtual hands-on learning, digital hands-on simulation, and social interaction with program leadership. To encourage active participation and add variety to the virtual format, a "care-package" with materials to perform an at-home splinting lab was mailed to students. In addition, students were encouraged to forage for wound care and splinting materials in their own homes to improvise with during a wilderness medicine session. To foster a sense of community and simulate in-person interpersonal interactions we dedicated 3 hours to meet with the chief residents and Program Director.

Impact: We accepted four students into the elective, all interested, and all applied for an interview. Despite the lack of contact in the clinical setting, this proved to be a worthwhile educational experience for the students and has the potential to be an alternative recruitment tool during an era where social distancing is imperative.

47 RISE-EM: Resident Instruction in Social Emergency Medicine, a Novel Curriculum

Heidi Roche, MD; Brandon Knettel, PhD; Christine Knettel, MD; Justin Myers, DO, MPH, FACEP; Sue Estroff, PhD; Tim Fallon, MD

Learning Objectives: (1) Describe the complexities and importance of the relationship between social determinants of health (SDH) and the emergency system, (2) recognize ways to implement social EM in one's EM practice, (3) identify and appropriately address SDH in the ED while practicing socially competent medicine.

Abstract:

Background: Understanding social determinants of health (SDH) and their intersection with EM, also known as social emergency medicine (SEM), is an important area of EM training. Despite the requirements of milestones disposition (PC7) and systems-based management (SBP2), little training material has been made available to teach this competency. Our goal was to create a curriculum to address these training gaps that could be easily adopted by EM training programs.

Curricular Design: RISE-EM: Resident Instruction in Social Emergency Medicine is a video-based training curriculum that consists of four 20 minute modules and a pre-post multiple choice test. While this offers scheduling flexibility, reflection from the pilot run suggests the course is best received when applied over several weeks with interleaved group discussions. With core objectives from the Social Medicine Reference Toolkit, a team of experts developed EM specific module content with material from the Inventing SEM conference. Using longitudinal cases, a conceptual framework is reinforced and built upon throughout the modules (Figure 1). Recurring "nudges" encourage participants to identify SEM implementation in and out of the ED.

Impact: RISE-EM has been successfully implemented in one conference with 48 faculty, residents, and medical students, receiving a strongly positive reception. Six participants completed pre-and post- assessments of SEM knowledge and self-efficacy in addressing SDH in the ED. Using paired-samples t-tests, we found that SEM knowledge improved by 3.2 points on average out of 19 questions ($t(5)=3.63$, $p=0.015$), while self-efficacy improved by 4.8 points out of 26 possible ($t(5)=3.24$, $p=0.023$). We are creating discussion guides and practice cases so this innovation can be more easily implemented by new programs. We see this project as a valuable tool EM residencies can use to address milestones PC7 and SBP2 in their curricula.

Module 1 Introduction to Social Emergency Medicine	Module 2 How Humans Change the Definition of Illness	Module 3 Cognitive Framework: Social Factors at the Bedside	Module 4 We Can't Do This Alone: An Approach that is Interdisciplinary and Multi-Sectoral
Objectives • Understand the role social determinants of health (SDH) plays in emergency system patients' health • Be able to state why SDH are important to the ED provider • Be able to identify opportunities to address SDH in various scenarios	Objectives • Understand the ability of society to shape medical definitions • Discuss the composition of high-frequency ED users • Use four lenses to help navigate disposition in socially complex patients	Objectives • Discuss and describe how bedside factors impact health equity and health outcomes • Understand challenges of physicians to provide health equity	Objectives • Be able to describe examples of innovative programs and pathways to discharge • Become acquainted with local resources and community programs • Apply this knowledge to patient cases

Figure 1. Breakdown of course modules by individual objectives.

48 Safely Securing a Chest Tube Using Cadaveric and Manikin Models

Mohamad Moussa,MD; Mark Bustillo, DO; Joseph Ryno, DO

Learning Objectives:

1. Teach EM residents how to safely and proficiently suture and secure a chest tube in a controlled setting as a precursor to performing the procedure in a high intensity clinical setting.

2. Bring attention to the potential operator risk associated with suturing in a chest tube.

Abstract:

Introduction/Background: Inserting a chest tube is an important life saving procedural skill for emergency medicine residents but there is not enough focus on the suturing and securing portion of the procedure. Rather, much of the focus is on making the initial incision through the chest wall into the intercostal space and wedging the tube into the pleural cavity. We propose that suturing and securing the chest tube is just as critical as the initial steps to avoid operator injury from a needle poke and to ensure the chest tube is securely fastened.

Curricular Design: At our bi-weekly simulation and procedural skills training day, EM residents are divided into groups of 3-4 and rotate through various simulation and skills stations. One day included this chest tube securement station. An experienced EM faculty member and PGY-3 senior EM resident gave a 5-minute introduction of the procedure and then guided the resident learners through a step-by-step approach using a life form manikin and human cadaver. One-on-one training took place of suturing, gauze placement, and connecting to the pleur-evac system with special attention dos and don'ts to avoid self-injury through needle poke and rib fractures.

Impact/Effectiveness: We identified a gap in the training of our EM residents when it came to safely suturing and securing a chest tube. We hear of many cases where a chest tube was placed quickly in a trauma patient and the resident was injured due to a needle poke or a broken rib. As a result, we immediately included this training into our training curriculum to emphasize the importance of effectively securing a chest tube in preparation for the clinical setting. The step by step approach provided necessary time for the EM residents to comprehend and perform the procedure proficiently. This amplified the focus on the final steps of the procedure to intentionally note the importance and risk involved in suturing a chest tube in place.

Figure.

49 Single, Daily Multiple-Choice-Question: A Microlearning Tool for a Core Emergency Medicine Clerkship

Moises Gallegos, MD, MPH; William Dixon, MD, MSEd; Danielle Miller, MD

Learning Objectives: We sought to deliver interspersed, concise teaching points on core content while providing direction for additional reading. Using pre-scheduled learning sets messaged to students each morning, we also hoped to create a more cohesive and dedicated learning experience.

Abstract:

The breadth and depth of Emergency Medicine (EM) can be both attractive and daunting for medical students exposed to the specialty on clinical rotations. For clerkship directors and education faculty, it can be difficult to review a representative amount of content in the short duration of a clerkship. For students, it can be challenging to know where and what to read for end-of-clerkship exams. Furthermore, social-distancing policies during the COVID-19 pandemic limited in-person instruction, potentially contributing to perceptions of decreased formal teaching. Creative use of interspersed learning sets can provide direction for and supplement the clerkship curriculum.

EMED Daily was created as part of a required EM clerkship at Stanford. Each EMED Daily is a single, multiple-choice-question (MCQ) bundled with relevant medical and procedural knowledge, as well as testing strategy for core EM content. Online survey software is used to automate the delivery of the next EMED Daily each morning. Building on concepts of "pushed" delivery from eLearning and digestible teaching moments from Microlearning, the EMED Daily allows students to engage in retrieval practice and review curated material while eating breakfast, brushing their teeth, or walking to shift. Learning sets reflect core topics from the Clerkship Directors in EM (CDEM) medical student curriculum and include links to free open access medical education (FOAMEd) resources. MCQs are not graded individually, but a completion rate of 75% is required for credit towards a final grade.

The EMED Daily has been well received by students. In 6 months, the average completion rate was 96%, well above the required amount. Students commented that the EMED Daily sets "were simple and good for framing," and "a great way to review a small amount of info every day." Additionally, as COVID policies affected the type of patients students could see, question sets were adjusted to supplement learning as needed.

50 Snow White Escape Room: Gamification for Emergency Medicine Residents

Kevin Hon, DO; Anita Lui, DO; Marion-Vincent Mempin, MD, FACEP

Learning Objectives: Our goal was to gamify medical education for emergency medicine (EM) residents by creating an Escape room based off of various EM topics. We hypothesize that our novel learning session would improve resident engagement and knowledge retention over traditional, lecture-based conferences.

Abstract:

Introduction: Today's emergency medicine (EM) residents are learning differently than their educators and benefit from more immersive education over lecture-based curricula. An Escape Room provides a unique opportunity to gamify learning for residents to collaborate, synthesize, and engage in a competitive environment in order to escape a locked room. This mini-curriculum provides stepwise instructions and tools needed to implement an escape room.

Curricular Design: Residents were assessed on their understanding of START triaging, toxicology, ventilators, venereal diseases, ultrasound, hyponatremia, and electrocardiograms. Residents were divided into four equal groups. There were seven locked puzzle boxes placed in the front of a classroom that sequentially led to the next puzzle. All groups attempted to "escape" their rooms simultaneously by sending a runner to unlock the corresponding box. Faculty members assisted with hints and assessed for the correct solutions. Learners were challenged with a series of Snow White themed puzzles. (Full description of the puzzles are available as an appendix for educators but have been purposefully omitted to prevent exposure to potential learners). Teams were timed, penalized for hints, and given

time bonuses for solving the final challenge. We collectively debriefed after the competition and assessed for retention of topics. The total cost of the material was $60. Our conference is based on a small-group, flipped-classroom model, but the escape room could also replace the time slot of a traditional lecture.

Impact/Effectiveness: Implementation of the Escape Room was well received by participants as a way to cover multiple EM topics. Residents completed an anonymous Likert scale survey. 92% rated the activity successful in achieving its goals and 96% in being an effective activity to include in the future. We are excited to share this activity with any EM residency looking to add a twist to their conference day.

51 Stanford Emergency Medicine Residency COVID-19 Reflection Rounds: A Facilitated Intervention for Building Resiliency

Al'ai Alvarez, MD; Jeffrey Sakamoto, MD; Kimberly Moulton, MD; Akivah Northern, M Div; Bruce Feldstein, MD

Learning Objectives: To demonstrate the use of reflection rounds with frontline trainees to reflect and use meaning-making and narrative medicine to normalize challenges and celebrations and manage the COVID-19 pandemic stressors.

Abstract:

Background: Residency training has its own innate challenges that lead to feelings of isolation in medicine. The COVID-19 pandemic further exacerbated this sense of isolation. Fatigue, stress, anxiety, and frustrations all add to the spectrum of human emotions resident trainees experience. Navigating the balance between professional and personal responsibilities amidst a pandemic creates a unique need for connection, especially during physical distancing and shelter-in-place restrictions. The ability to reflect on one's inner life is critical to practicing medicine with integrity, authenticity, and coherence.

Design: Inspired by the Stanford School of Medicine Reflection Rounds, adapted from the GWish-Templeton Reflection Rounds© (GTRR), Stanford Emergency Medicine (EM) chief residents, residency leadership, and chaplain from the School of Medicine developed a virtual GTRR reflection rounds event using an online platform, Zoom. This novel intervention is the first of its kind for frontline physicians held on a virtual platform. The session was developed and led by a chaplain/physician (a former EM physician), a chaplain co-facilitator, and two EM faculty.

Impact: EM residents voluntarily attended residency-sponsored, chaplaincy-facilitated reflection rounds during the initial peak of the COVID-19 pandemic. This space offered an opportunity for EM residents to be vulnerable about their inner life experience as frontline healthcare workers – their personal reactions, values, beliefs meaning, purpose, and connectedness.

52 The Online Art Museum: Facilitating the Integration of the Medical Humanities During Intern Orientation

Kamna Balhara; Nathan Irvin, MD, MSHPR; Logan Weygandt, MD, MPH

Learning Objectives: Participants were expected to:
1) Reflect on professional identity;
2) Gain introductions to each other and the city;
3) Practice close-looking and observation;
4) Examine one's own biases and assumptions

Abstract:

Introduction: The humanities have been deemed fundamental to medical education by the American Association of Medical Colleges and evidence suggests that they improve observation skills, empathy, and communication, and may impact transformational outcomes such as professional identity formation. Such critical competencies are especially important during the transition to intern year. In the COVID-19 era specifically, and tightly-packed intern orientation schedules in general, barriers exist to incorporating the humanities, especially at off-campus sites like museums. Since a virtual format may represent an innovative solution, we implemented an online art museum activity during intern orientation.

Educational Objectives: 1) Reflect on professional identity; 2) Gain introductions to each other and the city, 3) Practice close-looking and observation, 4) Examine one's own biases.

Curricular Design: We applied established museum-based pedagogy, including visual thinking strategies (VTS), which uses art to encourage multiple perspectives, critical thinking, and intellectual curiosity. Works from local museums and street art representative of diverse artists, time periods, and subjects were selected from publicly available online image galleries and collated into a presentation. Twelve interns completed a pre-session activity, then joined two emergency medicine (EM) faculty facilitators on Zoom and participated in a series of activities including paired introductions, triaging portraits as patients, and a VTS session. (Table 1) The activities involved reflection, observation, and individual and collaborative meaning-making using art.

Impact/Effectiveness: Participants (10) who completed the evaluation rated the activity as "excellent" and requested more sessions. Learner objectives were met. (Table 2) The online museum tour represents a low-cost, replicable approach to making humanities education accessible to EM trainees both within and across institutions.

Table 1. Description of activities.

Session Components	Description
Personal Responses Tour (pre-session)	Participants were asked to identify an image (from a collated set shared with them online) that spoke to their perceptions of starting residency and composed a brief written reflection
Paired Introductions (30 minutes)	Participants viewed a collated set of images and chose one that represented them. Participants went into breakout rooms in pairs to share and discuss their selected images, then introduced their partner to the large group via the image their partner had selected.
Visual Thinking Strategies (30 minutes)	Participants jointly viewed one work of art using a visual thinking strategies approach, where a facilitator leads participants in discussing what they see, why they see it, and what more they can find
Portrait Patient (30 minutes)	Participants were presented with a series of portraits, were asked to consider the portraits as patients, and then conduct "triage", and asked to share with the group which "patient" they thought most urgently needed their attention, and why
Sharing reflections (30 minutes)	Participants viewed the personal responses tour images together and shared their reflections on the transition to residency

Table 2. Evaluation of program.

	Participant Responses	Representative free-text comments
This session allowed me to reflect on my identity and role as a resident and new physician (Objective 1)	Strongly Disagree - 0% Disagree - 0% Neutral - 0% **Agree - 20%** **Strongly Agree - 80%**	"It's really nice to learn more about how my coresidents think and feel...further confirmation that we aren't alone in this." "I will try to keep on the forefront of my mind that everyone has a story and that we're all doing the best we can with what we have."
This session helped me get to know my co-residents better. (Objective 2)	Strongly Disagree - 0% Disagree - 0% Neutral - 0% **Agree - 10%** **Strongly Agree - 90%**	"I really enjoyed the change of pace and getting to know my peers better! "I think one of the hardest cultural aspects of medicine to overcome sometimes is being vulnerable and this activity really made it easy to share all of our experiences that we've had. I got to learn so much more about my co-interns and share things from my experiences." "I loved how open and vulnerable everyone was in sharing their interpretations and experiences. I learned that my anxieties and apprehensions about residency are not felt just by me and that I have an amazing support group of co-interns around me."
This session helped me think about (name of city) in a different way. (Objective 2)	Strongly Disagree - 0% Disagree - 0% **Neutral - 40%** **Agree - 10%** **Strongly Agree - 50%**	
This session has encouraged me to engage more with the arts and humanities in (name of city). (Objective 2)	Strongly Disagree - 0% Disagree - 0% Neutral - 0% **Agree - 40%** **Strongly Agree - 60%**	"I will try to organize an art outing with our intern class once galleries and museums open back up." "When able to with COVID, I would love to continue to explore more of the art here."
This session allowed me to practice the skills of close looking and observation. (Objective 3)	Strongly Disagree - 0% Disagree - 0% Neutral - 0% **Agree - 30%** **Strongly Agree - 70%**	
I feel that the skills we practiced today will be useful to me in the future. (Objective 3)	Strongly Disagree - 0% Disagree - 0% Neutral - 0% **Agree - 20%** **Strongly Agree - 80%**	"I think that this exercise will remind me to be more open minded to consider others' perspective when looking at a situation." "Not just taking patients and their chief complaints for face value but taking a moment to take a step back and look deeper" "It was a good exercise in listening to others, taking in their different perspectives on the same thing." "I learned that I'm quick to make judgments based on first impressions and if just take the time to stop and take a longer look I will often see something I did not see before."
This session encouraged me to think about my own biases or assumptions. (Objective 4)	Strongly Disagree - 0% Disagree - 0% Neutral - 0% **Agree - 30%** **Strongly Agree - 70%**	"I will try to listen before speaking myself as I know I sometimes get too eager and can miss out on another's perspective." "Looking at the painting we all discussed together made me reflect on my tendency to look at positives before negatives and how sometimes that can be good, while other times could block me from understanding a situation as a whole."
Participating in this session will change the way I think about or interact with patients in the future. (Objective 4)	Strongly Disagree - 0% Disagree - 0% Neutral - 0% **Agree - 30%** **Strongly Agree - 70%**	"It was a nice reminder to take a step back and try to view patients as a whole rather than a diagnosis or room number on my list."
Participating in this session will change the way I think about or interact with colleagues in the future. (Objective 4)	Strongly Disagree - 0% Disagree - 0% Neutral - 0% **Agree - 20%** **Strongly Agree - 80%**	"I learned that others' input and perspective enhances my own understanding and sparks ideas with the entire group." "Remembering that there are layers to us all and to be gentle with others."

53 Ultrasound Guided Intravenous Cannulation Training for Medical Students - A Team Based Learning Curriculum

Sean Burns, MD; Diandra Escamilla, MD; Stephanie Stapleton, MD; Kelly Mayo, MD; Laura Welsh, MD,

Learning Objectives: To develop an ultrasound guided IV curriculum utilizing a team-based learning session for third- and fourth-year medical students rotating through the emergency department.

Abstract:

Introduction/Background: Ultrasound guided IV (USIV) placement is an increasingly utilized skill among trainees in EM. Despite an increased integration of U/S teaching into undergraduate medical education, currently there is no published curriculum for USIV placement for medical students.

Educational Objectives: This curriculum sought to improve the USIV skills of medical students, specifically addressing safety, equipment, site identification, image acquisition, vein cannulation, and troubleshooting. Ultimately, participants should feel empowered to perform USIVs with resident supervision during their rotation.

Curricular Design: We created a two-hour interactive small group session for third- and fourth-year EM clerkship students rotating at Boston Medical Center. A comprehensive literature review and a needs assessment of graduating Boston University medical students who matched into EM informed our curriculum. Specific content was based off of the ACEP policy on US education and consensus from EM education and U/S faculty.

This project employed a Team Based Learning approach. A short instructional video was created by the authors and was required viewing for students prior to the teaching session (available at Youtu.be/yXZN-7UFn_E). During the session, individual readiness assurance tests assessed students' understanding of the content in the video. They were then divided into groups where they completed a team readiness assessment test. Following these tests, each team applied this knowledge utilizing a high fidelity, low cost USIV model prepared from a chicken breast and penrose drain (Image 1).

Impact/Effectiveness: In a post-survey given to the participants, 86% (13/15) of participants felt "comfortable/very comfortable" attempting an USIV on a patient in the future and approaching a resident to supervise them. 93% (14/15) of the participants "Strongly agreed" that the online pre-session video and the simulation model were useful.

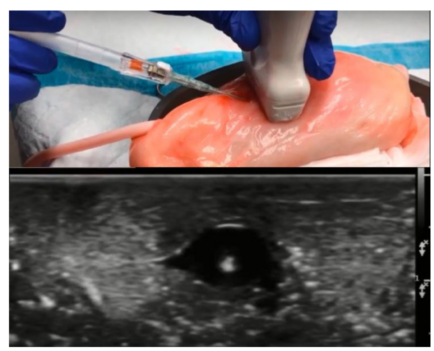

Image 1. Ultrasound Guided IV Training Video. A representative image from the training video illustrating use of the simulation model under dynamic ultrasounds.

54 Use of EBEM to Drive Quality Improvement Resident Projects

Maria Moreira, MD; Stacy Trent, MD; Maria Moreira, MD; W. Gannon Sungar, DO; Jennie Buchanan, MD; Christy Angerhofer, Miss; Richard Byyny, MD

Learning Objectives: We aimed to develop a system allowing for introspection and systematic changes providing residents with an understanding of QI principles.

Abstract:

Introduction/Background: The ACGME requires residents "demonstrate the ability to analyze the care they provide" and "play an active role in system improvement processes". Our residents satisfy quality improvement (QI) requirements by assessing their practice pattern comparing it with evidence based medicine (EBM). While allowing for introspection, this method rarely results in systematic change.

Curricular Design: After identifying practice variation and performing literature appraisal at conference, residents and faculty draft a guideline. Residents perform chart reviews and data abstraction to quantify variation in practice and potential implications of the proposed guideline. Collaboration with relevant specialties results in finalization of guidelines and implementation. Pre and post implementation data collection and analysis is performed to assess policy effect.

Impact/Effectiveness: Practice variation was identified in acute coronary syndrome (ACS) evaluation. After literature review, the HEART score was selected to risk stratify patients. Chart abstraction identified variability in care and demonstrated the HEART score accurately predicted risk of major adverse cardiac events (MACE). After implementing the HEART score pathway, data abstraction was performed for 12 weeks and showed the HEART score accurately predicted the prevalence of MACE: 0% (95% CI 0-1%) for low risk group, 10% (95% CI 8-14%) for moderate risk, and 55% (95% CI 41-68%) for high risk. Implementation of an institution specific HEART score pathway increased admission for the moderate risk group by 38% (95% CI 29-47%), decreased median ED length of stay by 37 minutes (95% CI 17-58 min), and increased objective cardiac testing among moderate and high risk patients by 10% (95% CI 0-19%). The impact on resource utilization lead to increased access for ED patients with a HEART score of 4 to ED and rapid outpatient stress testing.

55 Virtual Morning Report: A COVID-Era Innovation with Advantages over Traditional Models

Trevor Pour, MD; Samantha Ledonne, MD; Arjun Prabhu, MD; David Cisewski, MD; Elaine Rabin, MD; Andy Jagoda, MD

Learning Objectives: Virtual Morning Reports was created as a practical replacement for traditional morning report, in order to create a space for interactive case based learning. Multiple additional benefits were realized after our one-year pilot.

Abstract:

Introduction/Background: The requirement for physical distancing during COVID has led to challenges in education. Emergency Medicine (EM) residencies pivoted to online educational conferences, however a need for interactive education previously met through Morning Report remained. Third-year Teaching Residents (TRs), who historically supervised these sessions, also lost this opportunity for faculty-observed peer teaching.

Educational Objectives: VMR aims to fill the gap left by the cancellation of in-person educational activities. These goals are as follows: Allow for a venue for interactive discussion between students and faculty in a non-clinical space. Create an opportunity for TRs to hone teaching skills during their block. Create a model which is easily accessible to learners.

Curricular Design: VMR is held twice weekly using Zoom software, for strictly 30 minutes. The end time was enacted to ensure that participants can reliably schedule around VMR and see the entire presentation. Cases are presented by the TR, except for one monthly case by a pediatric EM fellow and one by a toxicology resident. Presentations encourage participation from the audience to develop a differential and discuss management. Residents on shifts have this half-hour protected and are expected to join, but sessions are optional for other residents. Individual feedback on session design is given by core faculty to the TR at the conclusion sessions.

Impact/Effectiveness: The first VMR occurred on May 12 and has continued without interruption all year. Participation ranges between 20-60 learners. VMR allows for off-service residents to stay in touch with our department. Faculty from multiple sites, who previously would not have venue to interact, discuss management with learners. Student participation includes pre-clinical as well as EM-bound students. "Virtual" clerkship students and interviewees are invited to VMR engage with our residency. This model is easily reproducible.

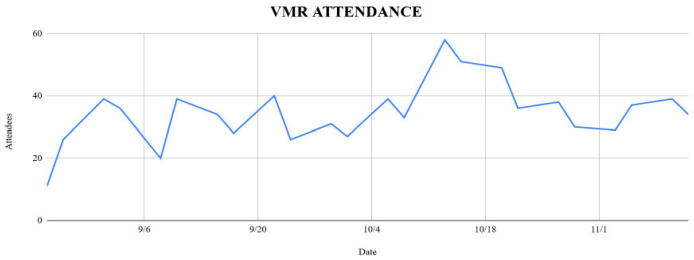

Figure.

56 Virtual Resuscitation Curriculum and Testing

Zachary Aust, MD; Jedidiah Leaf, MD; Robert Barnes, MD; Shane Jennings, MD; Shelly Saha, MD

Learning Objectives: Educational Objectives: Design a virtual critical care curriculum providing individualized education and formative evaluation to assess learner knowledge and address deficiencies.

Abstract:

Introduction/Background: Resuscitation is a cornerstone of EM. As our residents transition into the second year, they run our critical care/trauma pod. Prior to this they undergo

focused resuscitation education. This culminates with a high fidelity simulation and written test they must pass to be a pod leader. The prior written test was not an effective measure of learner knowledge.

Educational Objectives: Design a virtual critical care curriculum providing individualized education and formative evaluation to assess learner knowledge and address deficiencies.

Curricular Design: We designed an asynchronous curriculum consisting of podcasts and videos followed by a test. Topics deemed crucial for success in resuscitation were chosen. The test was designed to be given over Zoom as a PowerPoint presentation of 10 patient scenarios covering key concepts from the curriculum, followed by a more in depth review of the topic. Learners then took the test one on one with faculty. They were given a vignette with accompanying media (vitals, ECG, ultrasound video) and asked what next critical steps to perform. After each vignette, faculty gave real-time feedback to the learners on their answers and thought processes. This allowed for deliberate practice in a virtual environment. At the end, they were scored on specific strengths/weaknesses based on a standardized rubric.

Impact/Effectiveness: The curriculum was completed by 22 residents. Three faculty administered the test. After testing, all residents were surveyed anonymously. All stated the test was beneficial to their education and preferred to a written format. Learners also highly rated the objective scoring system. Overall, the test reinforced the topics where our learners were most uncomfortable. We would like to apply this format to multiple areas of the EM curriculum. Next year, we will increase the number and variety of patient scenarios in addition to refining the format of questions and scoring system.

Patient 1 (Unstable Vtach)	(One point each unless stated otherwise)
Recoginze Unstable Vtach	
Place Pad	
Synchronized Cardioversion	
Appropriate Joules	
Repeat EKG	
STEMI Yes or No	
Patient 2 (Cardiogenic Shock)	
STEMI Yes or No	
ECHO/RUSH Assesment	
Recognize Cardiogenic Shock	
Start Norepinephrine	
Patient 3	
STEMI Yes or No	
Patient 4 (Code Fast)	
Correct Labs	

Arrythmia		Possible
Recognition	0	3
Management	0	8
Airway		
Preox	0	4
Meds	0	3
Approach/Troubleshooting	0	6
Surgical Airway	0	9
Management of Extremisis	0	19

General Assessment/Reassesment	
STEMI Criteria	
Stroke	
Trauma	
Exam	
Management	

Figure 1. Scoring for virtual test.

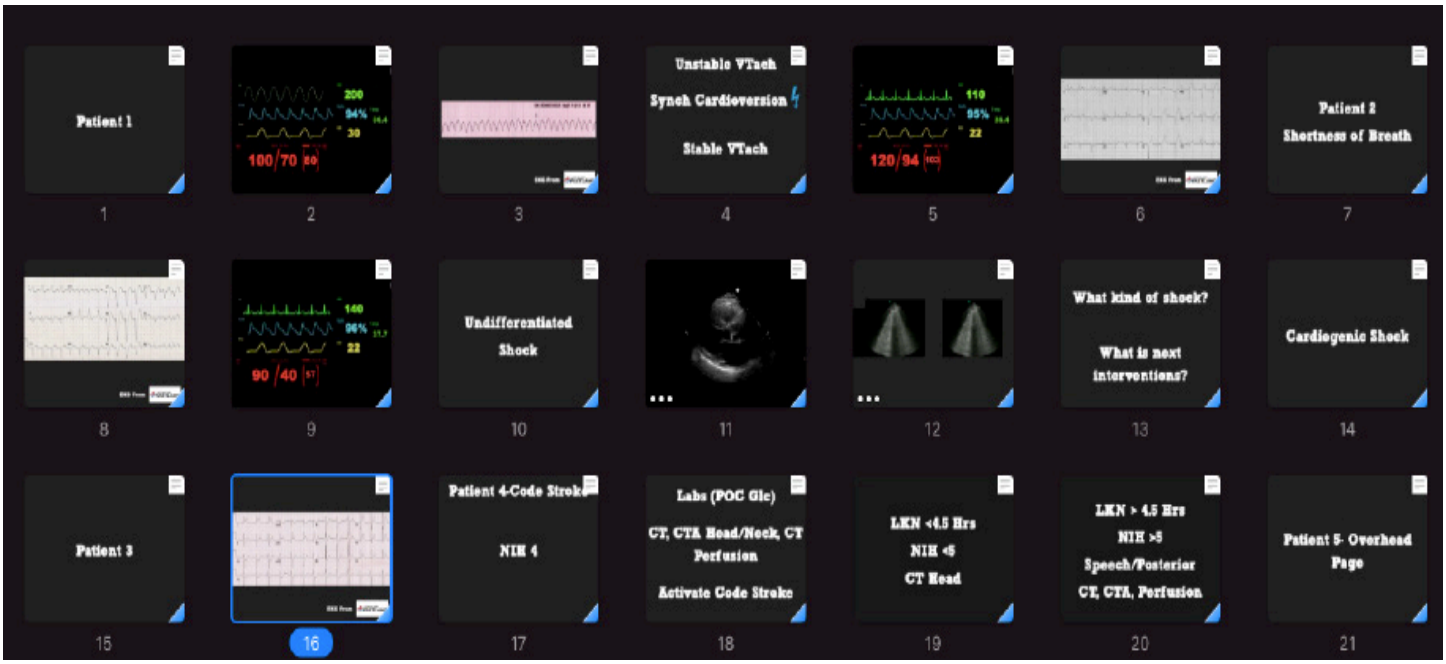

Figure 2.

57 Virtual Shadowing as an Effective Approach to Gaining Exposure to the Field of Emergency Medicine

John C. Wheelwright, BS; Riley Pence, BS; Boyd Richards, PhD; Robert Stephen, MD; Susan Stroud, MD; Megan Fix, MD

Learning Objectives: Expose students to the field of EM during the COVID-19 pandemic in a virtual setting.

Facilitate mentor-mentee relationships between EM staff and students.

Foster a peer-to-peer support network among similarly interested students.

Abstract:

Introduction: Shadowing is an important part of the education of medical students. The COVID-19 pandemic has limited medical students' hospital access during their first two years. In response, we implemented a novel virtual shadowing system to provide students with convenient and safe exposure to the ED.

Curricular Design: Six EM faculty hosted 2-hour virtual shadowing experiences. Up to 10 students per shift signed up via signupgenius.com. Before each shift, students were given a chapter from the EMRA/CORD student advising guide about EM. Virtual shadowing was conducted using a HIPAA-compliant Zoom account on an ED issued mobile telehealth iPad. The physician would bring the iPad into the room, obtain consent from patients, and ensure students were able to see the encounter. Between visits, students were encouraged to ask questions using the chat function. A short de-briefing followed each shift. Students were sent a post-encounter survey via Google Forms.

Impact/effectiveness: Survey responses were collected between October 20, 2020 and November 20, 2020. The overall response rate was 96.6% (56/58 surveys completed). Of respondents, 46 (82.1%) rated the experience as "effective" or "very effective" at providing exposure to EM. 53 (94.6%) said they would participate in virtual shadowing in the ED again, and 48 (85.7%) would do virtual shadowing in another specialty were it available. Further results are included in Table 1. Themed feedback from students is shown in Table 2.

We found virtual shadowing to be an easy to implement and effective way for students to shadow physicians in the ED. Even in post-pandemic times, virtual shadowing should be explored as an accessible and effective way to expose students to a broad array of specialties.

Table 1.

Focus of Question	Response Frequencies Across 5-point Scales				
	Very effective	Effective	Not sure	Ineffective	Very ineffective
Effectiveness as exposure to EM	10.7%	71.4%	10.7%	5.4%	1.8%
	Much more satisfied	More satisfied	Equally satisfied	Less satisfied	Much less satisfied
Satisfaction with virtual compared to in-person	1.8%	1.8%	26.8%	60.7%	8.9%
	Definitely yes	Likely yes	Unsure	Likely no	Definitely no
Would participate again?	71.4%	23.2%	3.6%	1.8%	0.0%
Participate in another specialty?	66.1%	19.6%	10.7%	3.6%	0.0%
	Much more likely with virtual	More likely with virtual	Equally likely	Less likely with virtual	Much less likely with virtual
Find faculty mentor	1.8%	10.7%	26.8%	41.1%	19.6%
Build rapport with peers	10.7%	19.6%	17.9%	44.6%	7.1%

Table 2. Student feedback (positives/critiques).

Positive Feedback	Critiques
Convenient with exposure to wide variety of cases *"Getting to see some of what goes on in the ED while avoiding COVID exposure; small time commitment."* – Student	Various technology issues (audio, video, etc.) *"It was a bit difficult to hear during the experience when we were not in a patient room…[maybe] the attending physician could use a microphone."* - Student
Real time discussions about cases *"We were able to ask questions and get prompt answers."* - Student	Meaningful relationships *"…I wish I could have connected more with the people on the Zoom as well as with personnel in the ED."* - Student
Easy first introduction to EM *"I thought that the virtual shadowing was helpful to get a better feel for what it is like to work in the ED, which I greatly appreciated."* - Student	Extra work for physicians *"…to have someone worrying about a laptop every second… isn't realistic, so I understand why at times the [iPad] was pushed to the side."* - Student

58 Virtual Simulation Going Live, a Feasible Option for Clinical Evaluation During the COVID-19 Pandemic

Jared Kilpatrick; Kelly Kehm, MD; Xiao Chi Zhang, MD; Dimitrios Papanagnou, MD

Learning Objectives: Demonstrate the ability of commercially available simulation software as an effective student assessment tool in lieu of live simulation during the COVID-19 pandemic.

Abstract:

Background: In-person simulation is often used as a tool for instruction and assessment in Emergency Medicine (EM). The COVID-19 pandemic, however, has necessitated

shifting simulation online. It is unknown if online simulation software, such as Full Code, represents an appropriate tool for simulation-based training.

Objective: We aim to assess Full Code, a commercial virtual simulation program, as an objective assessment of medical student performance in an EM Clerkship and Sub-Internship (Sub-I).

Design: Third-year (MS-3s) and fourth-year medical students (MS-4s) completed Full Code assessments during their EM clerkships and Sub-I during the pandemic. Full Code is a virtual simulation offered by Minerva Medical (https://full-code.com/). Our institution purchased a 1-year software license. Students had access to >100 virtual cases and participated in faculty-facilitated practice session, in lieu of in-person simulation. Students completed 3 Full Code cases as part of their clerkship grade, each of which aligned with course objectives. The grade the for cases was calculated using Full Code's internal scoring system and counted for 15% of the overall course grade.

Impact: On review of 120 MS-3 and 24 MS-4 students, the average final scores were 81.99% and 81.37%, respectively. For MS-4 students, there was no statistical difference between average score on the Full Code assessment and other assessments (departmental clerkship exam, shift evaluations). For MS-3 students, average score on the Full Code assessment was statistically higher than other forms of assessment (EM NBME Subject Exam, shift evaluations). Full Code represents a feasible alternative to simulation experiences in EM student courses. Next steps will evaluate the Full Code scoring system to determine if assessing for only critical actions represents a reliable proxy for student knowledge and performance, and evaluating whether the number of practice cases completed correlates with exam performance.

59 Virtual Simulation-Based Workshop for Addressing Patient Discrimination Against Trainees

Kimberly Sokol, MD, MS, MACM; Lauren Bacon, MD

Learning Objectives:

1.State 4 communication strategies medical trainees can use when faced with patient discrimination.

2.Apply those 4 communication strategies to actual patient scenarios.

3.State the resources available to employees at their hospital when faced with discriminatory patients.

Abstract:

Introduction: Incidents of patient discrimination towards medical residents can present intense challenges for them as they go through their training. There is, however, little guidance provided to resident physicians when faced with these challenges. In an effort to address this, we instituted a virtual simulation-based workshop to help trainees better navigate such encounters as they occur in the moment.

Educational Objectives:

1.State 4 communication strategies medical trainees can use when faced with patient discrimination.

2.Apply those 4 communication strategies to actual patient scenarios.

3.State the resources available to employees at their hospital when faced with discriminatory patients.

Curricular Design: We created a workshop to address discrimination towards medical trainees. It was a single 2-hour session that involved resident physicians from several specialties including emergency medicine, core faculty members, and program coordinators. Learners went through two virtual simulation scenarios depicting discrimination against trainees. In between the scenarios, the learners underwent a lecture in which they learned 4 different communication strategies to help them more effectively manage the discrimination. The second scenario was therefore used to help the learners put their knowledge into practice. Pre- and post-session questionnaires were distributed to evaluate the workshop in terms of learning and satisfaction.

Impact/Effectiveness: The workshop was effective in teaching strategies for managing patient discrimination in real time. Attendees expressed the desire for us to create similar workshops to include discrimination by attending physicians and advised the broader incorporation of hospital personnel; we are currently working on these. While prevention of these situations would be the ultimate goal, in the meantime, we can at least place our attention on giving our residents the tools to better manage these situations.

60 Virtual Standardized Direct Observation Tool (v-SDOT)

Amber Billet, MD; Robert Clontz, MD; Hieger Michelle, DO

Learning Objectives:

1. For attending physicians to complete a virtual SDOT instead of an in-person SDOT. 2. To provide emergency medicine residents real time feedback at the completion of the v-SDOT.

Abstract:

Introduction/Background: Resident feedback is an ACGME common program requirement. Feedback serves to help identify a resident's strengths and areas for improvement. It also aids residency leadership in identifying those individuals who may need extra educational assistance. One of the most common ways residency programs evaluate residents is through a standardized direct observation tool (SDOT). Traditionally, these individual resident SDOTs are completed by attending physicians in person. During the covid-19 pandemic, virtual video-based SDOTs (v-SDOT) were performed.

Curricular design: At a community academic emergency medicine residency program, with approximately 86,000 visits per year, two board certified emergency medicine attending physicians performed v-SDOTs on ten EM-2 and EM-3 residents. These v-SDOTs were performed by utilizing a video conferencing software program (Zoom) installed on a portal electronic tablet. The average total v-SDOT duration was 2 hours.

Impact/Effectiveness: The innovation for a v-SDOT was implemented for the first time during the covid-19 pandemic from June 1, 2020 to November 1, 2020. The v-SDOT enabled residents to receive feedback without requiring attending physicians to be physically present in the department. This decreased the attending's possible covid-19 exposure and helped to conserve personal protective equipment.

Based on resident survey results, 2 preferred v-SDOTs compared to live, 3 preferred live compared to virtual, 2 had no preference and 3 did not reply. Residents felt that both virtual and live SDOTs were equally distracting. Utilizing v-SDOTs has the advantage of attending physicians being able to complete these remotely. There was a perceived advantage that the residents may be less likely to ask the attending for advice in the v-SDOT format, making it a more realistic patient encounter.

Potential limitations of v-SDOTs include poor internet connectivity, tablet limitations such as attending field of view and microphone clarity/range, and the resident not carrying the tablet with them for the entire observation period.

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