

# EDUCATION RESEARCH DAY



Icahn  
School of  
Medicine at  
**Mount  
Sinai**

*Institute for  
Medical Education*

**April 19, 2016**

**Sponsored by the Institute for Medical Education**

## Education Research Day 2016

Welcome to the Institute for Medical Education (IME) at the Icahn School of Medicine's thirteenth annual Education Research Day (ERD). It is exciting to see the breadth of innovative medical education scholarship developed by our faculty, trainees, students and staff. Each year we welcome an expanding group of educators from all disciplines and levels of training. We are proud to display the excellent work being done in education research at the Icahn School of Medicine at Mount Sinai and our affiliate institutions.

### There are three goals for ERD:

1. To highlight and disseminate the educational research and innovative curriculum development at Mount Sinai and its affiliate institutions.
2. To provide a forum for educators to learn from each other and collaborate.
3. To prepare authors for regional and national presentation and dissemination of their scholarly educational work.

All submitted abstracts were reviewed by a selection committee. Abstracts were blinded and evaluated based upon established criteria for scholarship in education: Clear Goals, Appropriate Methods, Measures of Quality/Effectiveness, Significant Results and Reflective Critique. Innovation and impact of the project were also considered.

This year, five abstracts were chosen from 59 submitted to receive Blue Ribbons. Blue Ribbon Winners represent outstanding examples of educational scholarship.

In addition, we are very pleased to continue the "Facilitated Poster Walk and Discussion" at ERD this year. This began in 2013 to allow authors the opportunity to present their work, obtain feedback and gain valuable ideas from colleagues and peers in a structured manner. Abstracts have been organized into thematic groups and we have invited distinguished faculty to lead a discussion of the posters in a group with authors and visitors. Please review the schedule of these walks and join in to learn more.

We wish to thank the Selection Committee, the Department of Medical Education, and the authors who submitted their work. Congratulations to all of our authors for their dedication to education research and for sharing their innovative work with our community.



Reena Karani, MD, MHPE  
Director, Institute for Medical Education  
Icahn School of Medicine at Mount Sinai



Robert Fallar, PhD  
Assistant Director, Institute for Medical Education  
Icahn School of Medicine at Mount Sinai

## Education Research Day Selection Committee

Selection committee members did not participate in the discussion or voting for abstracts in which they were involved.

### The 2016 Selection Committee:

|                           |   |
|---------------------------|---|
| Reena Karani, MD, MHPE    | Committee Chair,<br>Icahn School of Medicine at Mount Sinai |
| Joseph Blankush, BA       | Icahn School of Medicine at Mount Sinai                     |
| Linda DeCherrie, MD       | Icahn School of Medicine at Mount Sinai                     |
| Carrie Ernst, MD          | Icahn School of Medicine at Mount Sinai                     |
| Robert Fallar, PhD        | Icahn School of Medicine at Mount Sinai                     |
| Andrew Goldberg, MD       | Icahn School of Medicine at Mount Sinai                     |
| Joanne Hojsak, MD         | Icahn School of Medicine at Mount Sinai                     |
| Leora Mogilner, MD        | Icahn School of Medicine at Mount Sinai                     |
| Lauren Peccoralo, MD, MPH | Icahn School of Medicine at Mount Sinai                     |
| Jonathan Ripp, MD         | Icahn School of Medicine at Mount Sinai                     |
| Rainier Soriano, MD       | Icahn School of Medicine at Mount Sinai                     |
| David Thomas, MD, MHPE    | Icahn School of Medicine at Mount Sinai                     |
| Lindsey Waldman, MD, RD   | Icahn School of Medicine at Mount Sinai                     |

## **Education Research Day Program – April 19, 2016**

### **Poster Display**

10:00 am – 4:00 pm

Guggenheim Pavilion Atrium

### **Facilitated Poster Walk and Discussion Schedule**

|                          |   |
|--------------------------|---|
| <b>10:00 – 11:00 am</b>  | <b>David Thomas, MD, MHPE</b><br>Curriculum (GME) I (posters 12 – 17)         |
| <b>10:30 – 11:30 am</b>  | <b>Reena Karani, MD, MHPE</b><br>Professional Development (posters 42 – 48)   |
| <b>11:00 – 12 noon</b>   | <b>Shubhika Srivastava, MBBS</b><br>Milestones/Competencies (posters 30 – 33) |
| <b>11:30 – 12:30 pm</b>  | <b>Natasha Anandaraja, MD, MPH</b><br>Global Health (posters 34 – 36)         |
| <b>12 noon – 1:00 pm</b> | <b>Leora Mogilner, MD</b><br>Community Health (posters 6 – 11)                |
| <b>12:30 – 1:30 pm</b>   | <b>Kaushal Shah, MD</b><br>Curriculum (GME) II (posters 18 – 23)              |
| <b>1:00 – 2:00 pm</b>    | <b>Turandot Saul, MD</b><br>Simulation I (posters 49 – 54)                    |
| <b>1:30 – 2:30 pm</b>    | <b>Peter Gliatto, MD</b><br>Curriculum (UME) (posters 24 – 29)                |
| <b>2:00 – 3:00 pm</b>    | <b>Robert Fallar, PhD</b><br>Assessment (posters 1 – 5)                       |
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**Please join us congratulating the 2016 Blue Ribbon recipients:**

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**Helping Housestaff with Handoffs: Impact of a Novel Handoff Tool and Direct Observation on Resident Internal Medicine Handoff Performance**

Sarah Lieber MD, Eric Goodman MD, Leslie Lee MD, Julie Pearson MPH, Brijen Shah MD

Abstract #55

**Simulated Death Enhances Learner Attitudes Regarding Simulation**

Chang Park MD, Douglas Wetmore MD, Adam Levine MD, Samuel DeMaria MD, Andrew Goldberg MD

Abstract #9

**Recipe for a Healthy Lifestyle: Teaching Obesity Prevention to Hispanic Mothers of Young Children**

Lindsey Waldman MD, RD, Genna Ableman MD, Marilyn Figueroa EdD, Heather Mitchell LMSW, Robert Fallar PhD, Leora Mogilner MD

Abstract #37

**An Educational Intervention to Improve the Use and Monitoring of Vancomycin in Pediatric Patients**

Sejal Bhavsar MD, Gail Shust MD

Abstract #31

**Is Granny Really Safe on July 1? Evaluating the Impact of Medical Student Geriatric Competencies in Internal Medicine Residents**

Erica Chu MD, Christine Chang MD, William Hung MD

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# **ASSESSMENT**

## **ABSTRACTS 1 – 5**

## ABSTRACT 1

### Leadership Performance: Self vs. Expert Assessment of Trauma Team Leadership

**Authors:** Suzanne Bentley MD MPH, Alex Manini MD MS, Mariam Taraq MS, Kimberly Dorso BS, Stuart Kessler MD, Kaushal Shah MD

**Purpose:** There is growing evidence demonstrating the importance of team leadership on trauma team performance. Advanced Trauma Life Support (ATLS) training remains the standard for trauma education, however with emphasis on assessment and management of traumatized patients without inclusion of formal education on teamwork skills and leadership. Knowing how to be an effective leader cannot be assumed, especially given known importance of this role within medical teams. Leadership skills are essential during trauma resuscitation, however rarely taught as part of the curriculum. While the trauma leader must be expert in the diagnosis and treatment of the trauma patient, he or she must also excel at directing and being responsive to other team members. Valid self-assessment is recognized as fundamental to continuing professional competence and development of life-long learning and improvement practices but is an understudied skill for development of medical team leaders. Previous study of resident cardiac arrest team leaders demonstrated that self-assessed values of confidence as team leader did not correlate with actual leadership skills. The purpose of this project was to compare EM trauma team leader self-assessed performance to assessment of their performance by supervising attending EM physicians to elucidate deficiencies in leadership skills.

**Methods:** Convenience sample survey of 38 paired high acuity (trauma case requiring activation of EM and surgical trauma team) trauma team leader assessments: leader self-assessment vs. attending physician (expert) assessment of leader. Survey items were comprised of questions from Team STEPPs leadership survey and scored on Likert scale of 1-5 with 1 representing “very poor” and 6 representing “superior”.

**Results:** Areas of significantly higher score reporting on self-assessment compared to attending physician assessment included: overall team leader performance (4.8 vs. 4.36,  $p < 0.01$ ), leader maintains a bird’s eye view (4.9 vs 4,  $p < 0.01$ ), use of closed loop communication (4.3 vs 3.7,  $p = 0.02$ ), use of effective interpersonal communication skills (5.1 vs 4.6,  $p = 0.03$ ), and leader delegated tasks clearly and appropriately (4.8 vs 3.8,  $p < 0.01$ ). There were no categories in which leader self-assessment was lower than attending assessment of the leader.

**Conclusion:** We found significant overestimation of leadership with self-assessment when compared with expert assessment. Deficits in leadership performance as assessed by expert physicians, as well as differing areas of assessment between self and expert assessment, may be utilizable as a novel feedback tool to team leaders and ongoing study should evaluate specific areas of trauma leadership feedback in the future.

## ABSTRACT 2

### Are All Milestones Equal in the Eyes of Residents? A Multicenter Study of Emergency Medicine Residents

**Authors:** Kevin Hu MD, Joan Noelker MD, Anne Messman MD, Tiffany Moadel MD, Sorabh Khandelwal MD, Heather Streich MD, Suzanne Bentley MD

**Purpose:** Feedback, particularly real-time feedback, is critical to resident education. The emergency medicine (EM) milestones were developed in 2012 to enhance resident assessment and many programs utilize them to provide focused resident feedback. The purpose of this study was to evaluate EM residents' level of interest in receiving real-time feedback on each of the 23 milestones.

**Methods:** This was a multicenter cross sectional study of EM residents. Participants were surveyed on their level of interest in receiving real-time feedback on each of the 23 milestones. Anonymous paper or computerized surveys were distributed to residents at three 4-year training programs and one 3-year training program with a total of 116 resident respondents. Residents rated their level of interest in each milestone on a 6 point Likert-like scale. Average level of interest was calculated for each of the 23 milestones, both as an average of all 116 respondents as well as by individual postgraduate year (PGY) level of training.

**Results:** The survey response rate was 59%. Residents had greater interest in receiving feedback on certain milestones than others. Interest in some milestones was dependent on the resident PGY level, however all PGY levels had the overall greatest interest in receiving feedback on emergency stabilization (PC1) and the least overall interest in receiving feedback on technology/electronic health records (SBP3). These findings, as well as data for the other 21 milestones, are found in the attached graph.

**Conclusion:** Residents ascribe much more value to certain milestones than others. This may have consequences for what type of feedback is sought by residents as well the value they place on feedback received from faculty. Awareness of residents' milestone valuing needs to be considered when developing an assessment program that should ideally place equal importance on all 23 EM milestones.

### ABSTRACT 3

#### Retention of Pediatric Advanced Life Support Knowledge and Skills amongst Emergency Medicine and Pediatric Residents

**Authors:** Kimberly Kahne MD, Sylvia Garcia MD, Louis Spina MD, Sheemon Zackai MD, Christopher Strother MD

**Purpose:** Pediatric cardiopulmonary arrests are infrequent, yet high-stake events. Physicians in the emergency department are required to maintain pediatric advanced life support (PALS) certification, but despite this, outcomes from pre-hospital and in-hospital events are consistently poor. Initial PALS certification is required for interns in pediatric and emergency medicine (EM) residencies. Prior studies have shown a decline in performance of advanced cardiac life support (ACLS) and basic life support (BLS) skills among other healthcare workers after initial certification. There have been no studies comparing performance skills between emergency medicine residents and pediatric residents in PALS, nor did we find studies evaluating the retention of skills at specific time intervals since initial PALS certification.

**Methods:** This study assessed the retention of PALS skills among EM and categorical pediatric residents. First and second year residents were randomly assigned to be evaluated 6, 12, or 18 months after initial PALS certification. All residents were tested using the same two PALS scenarios: Respiratory Core Case 4 (respiratory arrest following seizure activity) and Cardiac Core Case 11 (asystole). A previously validated scoring sheet was used to grade performance. All residents completed a questionnaire quantifying how many real resuscitation codes and simulation resuscitation codes in which each had been involved.

**Results:** 41 residents were evaluated, 19 EM residents and 22 pediatric residents. No significant differences in the mean scores were observed at 6 versus 12 versus 18 months after initial PALS certification using ANOVA. There was no statistical difference in mean score for the respiratory arrest case between EM and pediatric residents. There was a statistically significant difference in mean scores for the asystole case. EM residents scored higher, with a mean score of  $8.42 \pm 1.805$  (95% CI: 7.55-9.29) compared with pediatric residents' mean score of  $5.64 \pm 2.237$  (95% CI: 4.64-6.63). A linear regression coefficient was found to be 2.785 ( $p=0.0001$  CI: 1.487-4.083).

**Conclusion:** None of the residents achieved perfect scores. There was no significant difference in performance at the set interval times in this study, however this could be due to a small sample size. Overall, EM residents performed better than pediatric residents in both cases, presumably from more experience with cardiopulmonary arrests.



## ABSTRACT 4

### Is Resident Self-Assessment of Teaching Skills an Accurate Measure of Skills Used?

**Authors:** Suzanne Friedman MD, Scott Moerdler MD, Alefiah Malbari MD, Benjamin Laitman MS, Kathleen Gibbs MD

**Purpose:** Resident as Teacher (RAT) training curricula are growing across residency programs as the role of the resident in teaching students and peers grows. Current research on these programs is limited by the availability and methodology of studies assessing outcomes after RAT training. The majority of studies performed use learner or self-assessment of teaching skills before and after teaching programs. While multiple studies have looked at the impact of resident teaching programs on resident or student perceptions of teaching before and after the program, few have evaluated the validity of resident self-assessment of their teaching skills when compared to their students' assessments.

**Methods:** The Mount Sinai pediatric residency has a rigorous RAT curriculum, in the form of required workshops and a 3rd year rotation as well as an optional longitudinal teaching program (Resident Teaching Group - RTG). At the completion of residency, outgoing Mount Sinai pediatric residents were asked to assess their frequency of using selected teaching skills including "Setting Goals", "Using Questioning as a Teaching Tool", "Bedside Teaching", "Positive Learning Climate" and "Providing Effective Feedback". The survey was based on a 5 point Likert scale ranging from never (1) to always (5). Residents who completed the longitudinal teaching program (RTG), which provides monthly workshops on teaching skills, completed the same assessment of their skills following participation in the program. In addition to the resident self-assessments, medical students who participated in a preclinical pediatrics training program were asked to assess the frequency with which their resident mentors used specific teaching skills. Differences between student and resident responses were analyzed by t-test.

**Results:** Twenty three students and twenty one residents, 9 from the RTG and 12 graduating non-RTG residents, completed the assessment surveys. RTG residents had higher self-assessment scores than the students' assessment for "Setting Goals" (4.1 vs 3.5,  $P < .05$ ) and "Using Questioning as a Teaching Tool" (4.5 vs 3.9,  $P < .05$ ). Non-RTG residents had lower self-assessment scores than the students' assessment for "Bedside Teaching" (3.1 vs 4.3,  $P < .05$ ). Scores for "Positive Learning Climate" and "Providing Effective Feedback" were similar among student assessments and self-assessments from RTG residents and non-RTG residents.

**Conclusion:** Resident self-assessments of teaching skills often do not correlate with students' perception of their use. Under and over estimation of skills by the residents occurred, depending on the skill. Given that residents who participated in the longitudinal teaching program (RTG) tended to overestimate their skills in comparison to other residents, OSTEs and direct observations would provide more accurate assessments of teaching skills acquired. Our future work looks at the use of standardized observed teaching evaluations to measure residents' use of skills.

## ABSTRACT 5

Effect of Clinical Overlap on Attending Comfort Evaluating Residents: A Multicenter Study

**Authors:** Elaine Rabin MD, Emily Taub MD, Chen He MD, Emily Eaglstein MD, Cameron Sweeney MD, Saadia Akhtar MD

**Purpose:** Obtaining resident evaluations from attending physicians is notoriously difficult. Lack of attending comfort evaluating residents may contribute if contact between attendings and residents is sporadic or rare. Objectives: 1. Determine the extent to which attendings and residents overlap clinically. 2. Determine if extent of overlap affects attendings' comfort evaluating residents.

**Methods:** The study was conducted at 4 sites with 3 residency programs. All attending and resident schedules for 2 scheduling blocks were mapped to each other to determine overlap hours noting “swing” shifts (resident presents to >1 attending) and “senior” shifts (resident presents to senior resident). After each of block, a convenience sample of attendings rated their comfort level evaluating each resident with whom they had worked on a 5-point Likert item. Kendall’s Tau was employed to determine correlation between comfort and 1.post-graduate year (PGY), 2. Total and within-PGY overlap, non-swing overlap and non-senior overlap.

**Results:** Schedule mapping was performed for 3924 episodes of overlap (mean 5.8 h, std dev 2.9 h) for 2623 attending-resident pairings. Table 1 provides data on per-block overlap for attending-resident pairs. 140 surveys were completed (99% response rate) representing 1696 pairings: In 43.8% of cases attendings felt “very comfortable”, 19.6% “somewhat comfortable”, 11.1% “neutral”, 11.2% “somewhat uncomfortable” and 11.4% “very uncomfortable”. PGY and comfort level had a highly-significant moderate correlation ( $z=10.9$ ,  $\tau=0.22$ ,  $P < 0.01$ ). Table 2 provides correlations between comfort level and overlap

**Conclusion:** As expected, attending-resident overlap is often minimal and compromised by not working 1-on-1. Attendings reported surprising comfort evaluating residents overall. However, comfort was more strongly linked to PGY than to clinical overlap (only consistently significant for PGY1s, and with a small effect). This raises the possibility that attending feedback for a block might really reflect aggregate experience with residents.

# **COMMUNITY HEALTH**

## **ABSTRACTS 6 – 11**

## ABSTRACT 6

### Novel Use of Virtual Reality for Cardiovascular Health Education

**Author:** Socrates Kakoulides MD

**Purpose:** Introduction: Lifestyle modifications such as healthy eating, weight control, physical activity and stress management favorably impact the prevention of cardiovascular disease. While physician counseling has been shown to be effective at improving patient adherence, physicians report significant obstacles to counseling such as lack of time, compensation, and resources. Virtual Reality (VR) is a novel communication tool that may make counseling between health providers and patients easier and more impactful.

**Methods:** We will offer the VR experience that model healthy lifestyle modifications to patients at-risk for coronary artery disease in the outpatient cardiology setting. A cohort of patients will complete a de-identified health and demographic survey, as well as knowledge, attitude and behavior questionnaires before and after viewing the VR experience. Patients will return to the clinic at twelve weeks to complete similar questionnaires.

**Results:** We will assess user, safety, acceptance and satisfaction of the virtual reality technology. We will also measure retention of knowledge and impact on patients' behavioral health practices. We will use health and demographic data to identify groups that may have benefited most from the virtual reality technology.

**Conclusion:** This is a pilot and feasibility study testing user safety, acceptance, and satisfaction of virtual reality technology in the clinical setting. It is the first phase of a multilevel project investigating the impact of immersive media on cardiovascular behavioral health interventions.

## ABSTRACT 7

### Quality Improvement (QI) in an East Harlem Student Run Free Clinic: Medication Adherence among Patients on Oral Diabetic Medication Therapy

**Authors:** Robert Arao BA, Emily Leven BA, Thomas Barrett BA, Farrah Khan BS, Benjamin Shuham BA, Brijen Shah MD, David Thomas MD, Yasmin Meah MD

**Purpose:** EHHOP is a student-run free clinic serving uninsured adults in East Harlem. The majority of patients speak Spanish only. Type II diabetes is highly prevalent among this population, and poor medication adherence remains a significant barrier to health management. EHHOP prescriptions are all processed through the Mount Sinai Employee Pharmacy. In this QI project, we aimed to achieve a satisfactory level of medication adherence to oral diabetic therapy in 100% of EHHOP's diabetic patients by March, 2016 as measured by self-reported and pharmacy record data.

**Methods:** EHHOP medication audits were performed using Mount Sinai's electronic medical record (EMR) system. Two tools were used to measure adherence. EMR pharmacy data was used to calculate the Proportion of Days Covered (PDC), referring to the percentage of days in a given month in which a patient satisfactorily adheres to her prescribed medication regimen. The self-report Morisky Medication Adherence Scale (MMAS-8) was administered to patients in clinic. Baseline data was collected from June 2015 to January, 2016. Adherence was defined as  $\geq 80\%$  PDC and an MMAS score of "medium" or "high." Interventions (October-December 2015): 1. Clinicians were encouraged to take steps to simplify medication use for their patients by including translated Spanish language instructions on all medication orders. Our team worked with the Mount Sinai pharmacy to develop standardized translations for common medication instructions. These translations were incorporated into EMR protocols for clinician prescribing practices. 2. Clinicians received education on performing EMR medication audits and were encouraged to verify their patients' adherence status at clinic visits. Clinicians received "report cards" of their patients' PDC-measured adherence to metformin and/or glimepiride. 3. Patients received automated text message reminders in English or Spanish with instructions for requesting pharmacy refills. Reminders were sent three days prior to refill due date in order to help adherence to their scheduled medication regimen.

**Results:** The study population included 28 patients (15 women, 13 men). Twenty-four spoke primarily Spanish. All new metformin and glimepiride prescriptions for Spanish speaking patients included Spanish language instructions on the bottle (n=11). Average PDC for all 28 patients was 78.6% pre-intervention and 72% post-intervention (range: 29.9%--100%). The average post-intervention period for all patients was 96 days. Data collection will continue throughout February 2016.

**Conclusion:** Medication non-adherence places a significant cost on the healthcare system, particularly in the setting of clinic that spends a large portion of its budget on providing patients with free access to medications. When medications are not taken as prescribed, individual patients suffer health complications and healthcare systems incur greater financial costs in caring for these patients over the long term. Patient "report cards" were a useful tool for identifying patients struggling with adherence and prompting clinicians to discuss and address their patients' barriers to adherence.

## ABSTRACT 8

Inaugural Implementation of a Free Clinic Consultative Service: The EHHOPSchoTCH Program

**Authors:** Zachary Feldman MSc, Kathryn Taylor BA, David Thomas MD, Yasmin Meah MD

**Purpose:** Over 180 student-run free clinics (SRFCs) deliver healthcare to the nation's uninsured, providing unique service experiences for health professions students. Launching and sustaining SRFCs is challenging, particularly in the first years. Established SRFCs can provide valuable advisory services to evolving free clinics. We describe the implementation of an East Harlem Health Outreach Partnership (EHHOP) consulting program to educate new SRFCs in development and sustainability.

**Methods:** In 2015, EHHOP directors developed three arms of a consulting program: the EHHOP Scholarship Training, Consulting and Healthcare Advocacy Program or EHHOPSchoTCH. Arm one provides sponsorships to health professions students from US medical schools to attend the National Society of Student-Run Free Clinics (SSRFC) conference in January 2016, which fosters information sharing among SRFCs. Preference among a competitive applicant pool was given to SRFCs within 2 years of launch and located in states with poor Medicaid expansion. Awardees will complete a reflection questionnaire, providing qualitative data on needs of nascent SRFCs and the conference's impact on development. Arm two is a training program for ISMMS students to disseminate SRFC healthcare delivery models. In June 2015, seven students were selected develop a training curriculum for future consultants. They captured EHHOP's history through document reviews and oral histories and researched the histories and models of established SRFCs via virtual and live interviews. Students studied the variable qualifications for Medicaid across states and the regional impact of the ACA on SRFCs. A training manual and curriculum will be developed for use in the consulting arm of this program. Arm three provides a free student consulting service that launches in fall 2016. Consultants will provide phone, digital, and live support to new and existing SRFCs facing hurdles in implementation and sustainability.

**Results:** Nine medical students were selected from an applicant pool of 64 to attend the SSRFC conference in January 2016. Reflection questionnaire data will be collected in February 2016. EHHOPSchoTCH students developed a digital training and consulting compendium to train six ISMMS students as national SRFC consultants. They have also developed a repository for SRFC best-practices that will be accessible through the ISMMS and the SSRFC websites without charge. Over 30 evolving and established SRFCs visited the EHHOPSchoTCH table at the SSRFC conference interested in consulting services or collaborations to supplement our training and consulting compendium.

**Conclusion:** Established SRFCs can provide valuable outreach to SRFCs in development. The uptake of the EHHOPSchoTCH program will depend on visible promotion of services that meet variable SRFC needs and collaboration with established SRFCs to synthesize best-practices and changing care models. Consultative services must be provided at nominal cost because of financial strains on SRFCs. Cost considerations include travel monies, protecting time for EHHOPSchoTCH trainees to provide consultations and creating and updating digital resources.

## ABSTRACT 9

### Recipe for a Healthy Lifestyle: Teaching Obesity Prevention to Hispanic Mothers of Young Children

**Authors:** Lindsey Waldman MD, RD, Genna Ableman MD, Marilyn Figueroa EdD, Heather Mitchell LMSW, Robert Fallar PhD, Leora Mogilner MD

**Purpose:** More than 1 in 4 children in Head Start and elementary school in East Harlem are obese and more than 4 in 10 are overweight or obese. Little exists in the literature about obesity in this very young age group. Our objective was to assess the impact of an obesity prevention program on knowledge, attitudes and behaviors in Hispanic mothers of children ages 0-5 years.

**Methods:** With a grant from the American Academy of Pediatrics, we developed an obesity prevention program for parents of children ages 0-5 years. After reviewing the literature, pediatric residents worked with a certified nutritionist to create a 10-week curriculum which included topics such as feeding practices, fruit/vegetable consumption, and exercise. Each class was held in Spanish, included recipe preparation and exercise. After analyzing data from pilot programs in 2014, the curriculum was revised and run again, with the results presented below. Pre and post surveys were administered; the post included open-ended and retrospective pre/post questions to assess changes in knowledge, attitude and practices. We incorporated a modified version of Photovoice, a group analysis method where participants are asked to express their points of view by photographing scenes that highlight research themes, such as barriers in their community to living healthy lives. We analyzed textual responses using qualitative methods and compared and contrasted responses to identify themes. T-tests were used to analyze data.

**Results:** Two rounds of the course were held; 31 mother-child dyads enrolled and 25 completed the course. All families were Hispanic with Spanish as their primary language, 97% participated in WIC and 58% of mothers did not complete high school. Upon completion of the course, in the retrospective pre/post survey, parents reported an improved ability to recognize when their child is hungry, when their child is satisfied, feeling better able to provide a balanced diet for their child and know what their child needs to be healthy (all with  $p < 0.001$ ). They reported learning that reading and sharing books help their child's development and that it is not important for their child to finish their plate of food ( $p \leq 0.02$ ). At the end of the program, the majority reported that they had made changes to their eating habits: cooking more healthy foods and decreasing sugary beverages. The photos that the participants displayed led to discussion on how to overcome obstacles to living healthy lives.

**Conclusion:** After participation in this program, parents reported feeling better prepared and more knowledgeable about their children's diets and eating habits and reported making positive changes to their family's diet. Using photographs as a tool generated positive discussion and we plan to further develop the use of this technique. The curriculum is currently being formalized with the goal of dissemination to other sites.

## ABSTRACT 10

### Promoting Value-based Care in a Student-Run Clinic: An Application of Mobile-Based Decision Aids

**Authors:** Leela Chockalingam BS, Anirudh Kumar BA, Andrew Leader BE, Michelle O'Connor BS, John Power BS, Robert Rifkin BS, Brijen Shah MD, David Thomas MD, Yasmin Meah MD

**Purpose:** Rising medication costs threaten the limited budget of student-run clinics. Encouraging medical students to practice value-conscious decision making has the potential to decrease pharmacy-related expenditures while preserving quality of patient care. The East Harlem Health Outreach Partnership (EHHOP), Mount Sinai's student-run clinic, serves 25 patients per week on average. At EHHOP, use of a mobile knowledge repository lists drugs on formulary and their associated costs is encouraged. The utility of this mobile application as a cost-reduction tool has not been explored. Here, we describe three interventions aimed at promoting cost-consciousness among medical student care providers.

**Methods:** Sources of high prescription costs were identified from EHHOP 2014 invoices. Lower-cost, high-quality alternatives were selected using evidence-based guidelines. Specifically, high-cost statins (rosuvastatin) and proton-pump inhibitors (PPI) (esomeprazole) contributed significantly to expenditures. As such, both rosuvastatin and esomeprazole were targeted for our interventions. For intervention-1, rosuvastatin was blacklisted on the mobile formulary with "do not prescribe" text added. For intervention-2, providers were asked to re-evaluate the management of patients with gastro-esophageal reflux disease (GERD) using a paper-based decision tree, which directed providers away from more costly PPIs such as esomeprazole, and towards evidence-based lower-cost alternatives. For intervention-3, this PPI multi-step decision tree was moved to our mobile application. Each intervention spanned five clinic days. Data were collected from patients' electronic medical records.

**Results:** After intervention-1, 100% (2/2) of patients with standing rosuvastatin prescriptions were switched to more cost-effective alternatives. Zero new rosuvastatin prescriptions were written in the following weeks. During intervention-2, 42% (5/12) of patients with GERD had their reflux management re-evaluated via the paper-based decision tree. Four of these 5 were switched from a PPI to an antacid or H2-blocker and 1 was maintained on an H2-blocker. For intervention-3, the mobile-based decision tree was used for 2 out of 2 eligible patients: 1 patient's prescription was switched to a more cost-effective PPI (pantoprazole), while the second patient was able to be switched off of PPIs altogether.

**Conclusion:** Intervention-1 demonstrated that formulary modification can change prescription habits. When providers completed the paper- and mobile-based decision tree, all patients inappropriately receiving PPIs were switched to more cost-effective alternatives. These findings suggest that decision trees may be effective as point-of-care provider education when prescription decisions hinge on complex patient profiles and value considerations. As response was limited by uptake of the interventions by providers, similar future interventions should make uptake mandatory. Overall, our data suggest that provider prescription habits can be successfully influenced with evidence-based decision trees. Furthermore, the projected cost savings of \$5,768 from all three interventions represents a sizable 10.7% of prescription costs from the annual budget. Future efforts should utilize a multi-pronged approach to foster a value conscious prescribing culture amongst medical trainees.



## ABSTRACT 11

### Improving Student Clinicians' Documentation of Lifestyle Modification

**Authors:** Donna Jin BS, Iris Chen BS, Rae Dong BA, Brijen Shah MD, David Thomas MD, Yasmin Meah MD

**Purpose:** Student clinicians at the East Harlem Health Outreach Partnership (EHHOP) provide care for a patient population with a high prevalence of chronic disease. Discussing lifestyle modification and patient health goals is important but not always a priority for student clinicians. A patient survey (n=39) in 2015 indicated patients have high levels of confidence in achieving health goals, but face numerous barriers including cost and lack of knowledge. One-on-one discussion with a clinician was the top resource patients indicated would help them achieve their health goals. Following a discussion, high-quality documentation is essential, particularly in a trainee clinic where clinicians vary weekly and frequent handoffs are standard. Encouraging student clinicians to prioritize discussion and documentation of lifestyle modification may improve patient satisfaction and longitudinal management of chronic disease. Our aim was to increase the percentage of visits in which student clinician's document patient diet, exercise and health goals by 20% among all patients at EHHOP.

**Methods:** For Intervention 1, we created two documentation templates within the clinic's electronic medical record (one for diet and exercise, one for health goals) and provided in-clinic reminders for 3rd year student clinicians to use them. For Intervention 2, we integrated two additional features into clinic protocol. First, the 4th year student clinician leader added lifestyle modification discussion and documentation to the task list for 3rd year student clinicians, based on patient needs. Second, Nutrition Corps members (trained 1st and 2nd year student clinicians) were available in clinic to provide counseling and document discussions. We measured documentation rates by reviewing all student notes from the four consecutive clinic days within each period (Baseline, Intervention 1, Intervention 2).

**Results:** From Baseline (n=54) to Intervention 2 (n=57) among all patients, diet documentation increased from 48% to 68%, exercise documentation increased from 35% to 53%, and health goal documentation increased from 22% to 39%. Student clinicians responded more positively to template-based Intervention 1 for patients with no diabetes, but responded more positively to referral-based Intervention 2 for patients with pre-diabetes or diabetes. The highest rates of documentation were seen with Intervention 2 for pre-diabetes patients: documentation reached 92% for diet, 75% for exercise, and 58% for health goals.

**Conclusion:** Student clinicians may perceive lifestyle modification to be a low priority due to more immediate medical concerns, decision to manage chronic disease with medications alone, limited time or insufficient training. Our results demonstrate that documentation templates provide a mechanism for standardizing and improving the quality of lifestyle modification documentation, but multi-pronged systemic efforts are required to facilitate execution. Future studies will examine the effect of increased discussion and documentation of lifestyle modification on patient satisfaction, quality of handoffs and health outcomes.

# **CURRICULUM (GME) I**

**ABSTRACTS 12 – 17**

## ABSTRACT 12

### Creation of a Digital I-book Curriculum for Anesthesiology Residents

**Authors:** David Berman MD, Adam Levine MD

**Purpose:** Today's resident is a product of the millennial generation, a group notorious for the reliance on digital technology and the utilization of social networks and online resources in order to learn new things, share content and produce original work. This poses challenges for residency programs, as these learners challenge the existing paradigms for education that have been in place for decades. Residency programs have responded by instituting daily lectures, simulation sessions, case discussion and problem-based learning. While these serve an excellent purpose, they largely do not utilize technology pervasive throughout the rest of the millennial's life. Among the most stressful periods in an anesthesiology resident's career is the beginning of the introduction to residency; this period is marked by a steep learning curve, the introduction of an entirely new set of agents and techniques and the first time residents will be left alone with patients undergoing anesthesia. There is no standardized curriculum; training programs around the country use their own individual lecture series, usually alongside pairing with faculty. This experience predisposes residents to have varied experiences depending on their attending preceptor and case mix.

**Methods:** Our team's aim was to create a curriculum using the iPad to encourage resident self-education. This resource was hand-coded from scratch, covering the basics of anesthesiology using our curriculum as a framework. This resource contains interactive, rich media allowing for self-evaluation and further study and is flexible to the learner. It includes a number of different features to allow residents to quiz themselves and review material. In total, the resource contains greater than 200 pages of original content, over 180,000 lines of code and a number of novel features.

**Results:** While data is still being collected, our residents averaged approximately 18 hours of studying with the book over the first two weeks of July (and a total of 31 hours by the time our study concluded 6 weeks into PGY-2) and report a high satisfaction with the product. Attending preceptors have reported that the residents' knowledge base seems to be above the level of prior residents. We are currently awaiting objective data (in-training exam results and anesthesia knowledge test scores) as an objective measure of comparison, but subjectively the residents rated this resource highly and reported they wanted more resources of the sort.

**Conclusion:** The presence of an iBook curriculum for the beginning of residency served to augment clinical learning, and was favorably received by residents and their attending preceptors alike. Further directions include expanding this curriculum to other programs or areas of anesthesiology education.

## ABSTRACT 13

### Examining Outcomes of Minority vs. Non-Minority Applicants to a Large, Urban Academic Pediatric Residency Program

**Authors:** Anthony Bui BS, Gaber Badran BS, Frank Basloe BS, Scott Barnett MD, Joel Forman MD, David C. Thomas MD, Gary Butts MD, I. Michael Leitman MD

**Purpose:** Racially and ethnically diverse residency training programs enhance the learning environment and may improve the provision of healthcare to urban, multicultural patient populations. Despite that, underrepresentation of minority groups among trainees persists and continues to have an impact upon the physician workforce. As such, there is a need to understand barriers to improving this trend, which may in part relate to the stages of recruitment into graduate medical education (GME) where significant underrepresentation might occur. The aim of this study was to examine the process and results of underrepresented minority (URM) and non-URM applicants to a pediatric residency program based at a large, urban academic medical center during the 2014-2015 application cycle. The program made specific efforts to increase the recruitment of URMs that included discussions about diversity as part of the interview process over the past years.

**Methods:** Data from the 2014-2015 residency application cycle at the Icahn School of Medicine at Mount Sinai Pediatrics Program (ISMMS MSPP) was analyzed. The following data points were noted: whether the program reviewed the candidate's application and invited the candidate to interview, the candidate attended the interview, the program ranked the candidate, the candidate was ranked to match, and the candidate matched into the program. Race and ethnic information were recorded when self-identified by the candidate. URM was defined as African American, Hispanic, or Native American. Fisher's exact tests were used to examine relationships between the candidates' URM designation and the data points of interest during the application process; p-values less than 0.05 were considered significant.

**Results:** Of the 1,304 candidates who applied to the ISMMS MSPP in 2014-2015, 18% (234) identified as URM and 82% (1,070) non-URM. The program reviewed 48% (112) of the URM and 46% (490) of the non-URM applicants; the difference between these rates was not significant. Among those whose application was reviewed, the program invited 46% (51) of the URM and 57% (278) of the non-URM candidates to interview; these rates were significantly different ( $p < 0.04$ ). Of those who matched to the program, four of the 14 residents (29%) were URM. This rate improved from the previous year (17%) and is higher than the national match rate of URMs into pediatric programs (10%). There were no significant differences between URM and non-URM candidates in their interview attendance rates, likelihood that the program ranked them to match, nor the rate in which they matched into the program.

**Conclusion:** More work needs to be done to promote recruitment of URM candidates into GME. Although this association was not specifically examined, discussions focused on diversity during the interviews may enhance URM recruitment. Greater efforts by the program during the review and interview process might result in improved URM representation in GME programs.

## ABSTRACT 14

### Implementation of a PCMH Curriculum: Keeping the Finger on the Pulse (Evaluating and Reevaluating the Outcomes)

**Author:** Andreas Cahrssen MD

**Purpose:** Teach the relatively new concepts of Patient Centered Medical Home (PCMH) to Family Medicine residents as they will graduate into an environment where PCMH is part of the fabric of care, and their practice will be assessed for adherence to PCMH standards. Residents need to know the resources available and understand the barriers to comprehensive care.

**Methods:** We chose to start a dedicated rotation called the PCMH that focuses on transitions between the inpatient and outpatient setting. The rotation includes: a) Warm hand-off from the hospital on discharge day to follow-up in the outpatient clinic with the same provider. b) Focused review of literature with faculty support on potential barriers (finances, medication adherence, systems and personal barriers to follow-up). c) Visit to collaborating community sites (Community Health Center, Alcoholics Anonymous, homeless sites), home visits. d) Participation in currently used innovative chronic care models (multidisciplinary team for HIV, diabetes and mental health, Care navigators) e) Use of a unique documentation template in EMR that allows reviewing important aspects of transitions from hospital to outpatient setting. f) Monitoring feedback to the curriculum via self-assessment using survey monkey. Tracking of patient outcomes examined how this curriculum alongside with other PCMH efforts in our clinic affected the clinic's patient outcomes: Follow up 1 week post discharge, integration of a discharge summary from inpatient to outpatient EMR within 2 days, and 30 day readmission rates.

**Results:** In the course of 2 1/2 years a total of 23 residents finished the curriculum. The second year of the rotation was shortened from a 4 to 2 week rotation. We found that residents with the 2 week rotation had less exposure to case management. They also saw 2/3 fewer patients post-discharge. All residents reported the rotation was valuable and increased their understanding of PCMH. Patient outcomes showed no difference in likelihood that a discharge summary was integrated into the outpatient EMR within 7 days. The results did show that 30 days readmission rates were decreased after the start of the PCMH rotation versus prior to the existence of the rotation. Medication reconciliation rates went up.

**Conclusion:** After the first year of the rotation we identified that although we had assigned focus faculty as resources for bibliography, there was inconsistency in the actual contact being made. We since made a change to reflective writing, which increased the meaningful review of the literature. We identified the barriers in successful scheduling on patients at risk in the outpatient setting and have since made adjustments in our templates to allow for easier scheduling. Residents have been consistently appreciative of the opportunity to work with community partners. Connection with PCMH staff members is challenged by the change in personnel and expansion of programs.

## ABSTRACT 15

Development of a Wellness Curriculum to Combat Burnout, Isolation and Compassion Fatigue

**Authors:** Sangita Goel MD, Krishna Chokshi MD, Shelly Latte MD, Vani Gandhi MD, Erica Vero MD

**Purpose:** Recent data suggest that nearly half of all physicians in the United States experience burnout and Internal Medicine residents are amongst the most affected. Practices that foster the ability to reflect meaningfully on clinical experiences as well as mindfulness based interventions and relaxation techniques have been widely used in the healthcare setting with promising results in alleviation and prevention of burnout. Currently there is no forum within our program for exposure of residents to these practices.

**Methods:** We developed a comprehensive Wellness Curriculum that currently encompasses three components: medical humanities, Mindfulness training, and evidence based Integrative Medicine. We conduct these sessions in intimate groups, during protected time and ensure exposure of the entire housestaff program. In “Reflection Rounds” residents discuss key themes such as, “Experiencing Loss,” “Grappling with Burnout,” and “Promoting Empathy”. We utilize techniques of collaborative writing, discursive methods and discussions of relevant articles, prose, and poetry. In our Mindfulness sessions, residents are exposed to relaxation techniques such as the “body scan”, mindful communication, yoga and stress awareness techniques. Each session offers a safe space for introspection and expression in an effort to develop successful habits for coping and growth. In addition to attendings, we have utilized our peers, residents and interns, who are trained in these wellness methods to lead many our sessions.

**Results:** To date, in a few short months we have successfully held twenty wellness sessions with many more scheduled. Our preliminary surveying of residents with the Maslach Burnout Inventory established a high prevalence of burnout. To date, preliminary anecdotal feedback on the Wellness Curriculum has been overwhelmingly positive. Residents have expressed the need for and appreciation of a forum in which they can share their thoughts and experiences and develop practices to cope with the inherent challenges of our field. They have also expressed the positive impact of yoga and mindfulness activities on their resilience at work and on their empathy while caring for patients. By creating a safe space and community, residents have come forth seeking additional support and counseling. We will continue to survey our residents to determine the impact of this curriculum.

**Conclusion:** The core tenet of reflective medicine maintains that fostering emotional intelligence offers a powerful cognitive resource for providing better medical care. Mindfulness based tools have been shown to improve stress awareness, compassion, communication and quality of life in health care providers. We are hoping that through a varied wellness curriculum we can improve resident well-being and alleviate or prevent burn-out. These methods when integrated into medical education can also cultivate residents’ ability to derive meaning and fulfillment from one’s professional work and deliver more empathic care.

## ABSTRACT 16

### If You Build It They Will Come: An Innovative, Systematic, Multi-Faceted Approach to Creating a Successful, Well-Attended Noon Conference

**Authors:** Sangita Goel MD, Alejandro Diaz MD, Tejas Patel MD

**Purpose:** The ACGME recommends that residents attend teaching conferences on a regular basis. The multitude of clinical responsibilities and competing demands on residents has made it challenging to attend daily educational activities. At our institution, noon conference has historically been poorly attended. We hypothesized the following reasons for this: 1) Lack of a formalized structure: the conference topics were randomly scheduled and there was no schedule provided in advance. 2) Lack of Accessibility: our hospital spans six sites and the conference is only available at two. 3) Inadequate Faculty Participation: on average, faculty led only 20-30% of lectures.

**Methods:** We developed an innovative multifaceted approach to systematically address each of these issues. 1) Creating a formalized structure: we organized our conference by subspecialty topic, with the number of lectures weighted based on the ABIM blueprints. We cover each major topic over the course of 1-2 months. This allows residents to study one subspecialty at a time and compound their learning. To ensure the curriculum is well rounded, we incorporate lectures on general medicine, healthcare, ethics and wellness. This lecture schedule with associated MKSAP questions is collated in an online syllabus. 2) Accessibility: to address access issues for our off-site residents, lectures are recorded and made available via cloud-based video sharing; house-staff can watch from home or on their mobile device. 3) Recruitment of faculty: presenting an organized new curriculum with the guarantee of house-staff attendance enabled the support of division chiefs and thus faculty.

**Results:** After initiating these changes in September 2015, we achieved a fourfold increase in faculty-led didactics, with faculty participation in 70-80% of all conference. Resident attendance to conference has averaged about 80% (CI60-100%) since the onset of the new curriculum and continues to improve. Attendance has remained stable throughout busy floor month (e.g. winter months) when census is high.

**Conclusion:** Through a targeted needs assessment of our noon conference, we developed a feasible, high-yield intervention for improving resident attendance. By creating in advance a structured and electronically accessible curriculum based on ABIM blueprints, we subsequently improved buy-in from residents and attending faculty. These changes have significantly shifted the culture wherein residents prioritize conference. The adage stands true “if you build it, they will come.”

## ABSTRACT 17

### Incorporating Robotic-Assisted Surgery Training into Integrated Thoracic Surgery Residency Programs

**Authors:** Chyun-Yin Huang MD, Adil Ayub MD, Ahmad Al-Taweel MD, Wissam Raad MD, Faiz Bhora MD

**Purpose:** With increased usage of robotic techniques across surgical fields, there is a need for residents in Integrated Thoracic Surgery (I6) programs to have early exposure and familiarity with the robotic platform. Various curricula for robotic-assisted surgery have been published for general surgery but there are no standardized curricula for training residents in robotic-assisted thoracic surgery. We propose a curriculum that can be incorporated into I6 programs to increase resident competency.

**Methods:** We surveyed I6 program directors in the United States and performed a PubMed search using the following keywords: “robotic surgery,” “robotic curriculum,” “robotic thoracic surgery,” and “resident education”. We reviewed various robotic surgery training curricula and evaluation tools currently being used in the training of general surgery residents. We then designed a framework adapted towards I6 residents based off our review and program directors’ survey consensus.

**Results:** Used in nearly 400,000 total surgical cases in 2013, the role of robotic assistance has also been expanding in the field of thoracic surgery. Additionally, there is an increase in resident interest for formal training in robotic surgery. We have designed a graduated curriculum that facilitates resident competency in robotic assisted thoracic surgery. This curriculum is integrated during PGY2-6 years and is divided into preclinical (PGY2-3) and clinical (PGY4-6) stages (Table 1). In the preclinical stage, residents are required to complete introductory online modules, virtual reality (VR) and simulator training, as well as in-house workshops. During clinical stage, the resident will serve as a supervised bedside assistant (SBA) and progress to a console surgeon. Each case will have defined steps that the resident must demonstrate competency. Evaluation will be based on guidelines set by Global Evaluative Assessment of Robotic Skills (GEARS). For programs that do not meet robotic case volumes for resident training, we recommend collaboration with a high volume center performing robotic surgery.

**Conclusion:** Expansion and utilization of robotic assistance in thoracic surgery has increased. Our curriculum enables thoracic residents in I6 programs to have increased exposure to robotic platform and to master basic skills required in robotic assisted thoracic surgeries.



# **CURRICULUM (GME) II**

**ABSTRACTS 18 – 23**

## ABSTRACT 18

### Assessing Formative Feedback after Table Conferences in the Icahn School of Medicine's Structures Course

**Authors:** Patrick Maffucci BA, Benjamin Laitman MS, Jeffrey Laitman PhD

**Purpose:** The Structures course at the ISMMS is a combination of three courses taken by first year medical students: Gross Anatomy, Histology, and Embryology. This course allows integration of these three areas to enhance student learning and offer a unique perspective for medical students. We have previously reported our efforts to increase Teaching Assistant (TA) involvement in the course. Senior TAs (4th year medical students, scholarly year medical students, or PhD phase MD/PhD students) have become responsible for a broad range of activities in the course, notably organizing and presenting content at a variety of review sessions and proctoring table conferences. Table conferences (TCs), a substitute for practical exams that have normally been conducted by faculty members, were transitioned entirely to Senior TAs last year. These conferences are an oral assessment of students' practical and conceptual knowledge, meant to model interactions students have with residents or attendings in their medical education. It is our hope that students become comfortable with this format in preparation for these future interactions. TCs are conducted by Senior TAs four times during the course and result in a group grade of 6 (below average), 8 (average), or 10 (above average). After each conference, TAs record the table's grade and then give formative feedback about the group's performance. This year, we seek to explore the dynamics of post-table conference formative feedback. This feedback is meant to give students a chance to reflect on their TC performance and analyze their strengths and weaknesses. TAs give students a chance to explain how they felt about a conference before discussing their own thoughts. Students do not receive their grade on the day of the conference so as to avoid discussions focusing on quantitative grades rather than qualitative feedback.

**Methods:** To assess the effectiveness of feedback, we have surveyed the TAs that have led TCs, and in addition, are conducting group sessions with first year medical students to solicit their opinions about conferences.

**Results:** Overall, response to TCs and conference feedback from students and TAs has been very positive. However, some responses we have already obtained indicate that the withholding of grades during post-conference feedback may actually have an opposite effect than desired, leaving students to "read into" TA feedback to determine the grade instead of qualitatively critiquing their own performance. In addition, when giving feedback to a table who has received a grade of "6", TAs have noted difficulty with finding a balance between being too upbeat, giving a false sense of optimism, and being too negative.

**Conclusion:** Regardless, the act of giving table conferences and formative feedback to students is excellent preparation for future medical education and TAs often feel better prepared for other teaching positions having been a TA for Structures.

## ABSTRACT 19

### Community Pediatrics and Advocacy Training in New York State: Where We Are and Where We Want To Be

**Authors:** Leora Mogilner MD, Wee Chua MD, Dodi Meyer MD, Anne Armstrong-Coben MD, Collins Cappy MD, Laurie Gordon MD, MA

**Purpose:** Current ACGME guidelines mandate that pediatric residency programs must include two educational units of 'ambulatory experiences to include elements of community pediatrics and child advocacy.' New York State (NYS) is home to 30 of the 200 pediatric residency training programs in the United States, many in close proximity to one another. The NYS Pediatric Advocacy Coalition (NYSPAC) was created to enable pediatric residency programs to share community pediatrics and advocacy curricular resources, offer a platform for joint training opportunities and create a unified voice to advocate for child health issues in NYS. Our objective was to investigate the current state of resident training in community pediatrics and advocacy in NYS and identify barriers to creating successful training programs.

**Methods:** The faculty members responsible for resident training in community pediatrics/advocacy at each NYS pediatric residency program were contacted. A phone survey was administered with structured questions about training and available resources and open-ended questions about programs' strengths and challenges. Qualitative analysis was performed by 2 readers to identify domains and ensure inter-rater reliability. IRB approval was obtained from the authors' institutions.

**Results:** Twenty-one (70%) of the 30 community pediatrics/advocacy course directors were surveyed. 100% of programs offer community pediatrics/advocacy training. 9 (43%) have a stand-alone rotation, 6 (29%) have community pediatrics/advocacy training integrated into other rotations and 6 (29%) have a mixture of both. Residents spend an average of 4 weeks on their community pediatrics/advocacy training during residency. 10 (48%) of course directors surveyed have protected time to oversee their programs, ranging from 5-50% FTE. 15 (71%) of course directors have no administrative support. 100% of respondents were interested in collaborating with other pediatric residency programs, participating in joint faculty development and sharing curricula. 90% were interested in joint resident training. The greatest barriers identified were not enough protected faculty time and lack of administrative support.

**Conclusion:** Community pediatrics/advocacy training directors in NYS uniformly welcome collaboration between residency programs. They identify lack of faculty time and lack of administrative support as the main barriers to creating successful programs. Sharing resources and creating opportunities for joint faculty development and resident training can mitigate these barriers. Future plans involve creating a platform to share curricula and continuing to collaborate on community-based projects with the goal of creating a network of future pediatric leaders who can advocate collectively on behalf of children in NYS.

## ABSTRACT 20

### Assessing the Efficacy of Transthoracic Echocardiography Simulator Training and Bedside Teaching for Anesthesiology Residents

**Authors:** Nandini Palaniappa MD, Muoi Trinh MD

**Purpose:** The use of transthoracic echocardiography (TTE) has increasingly played a larger role in the management of critically ill patients during the perioperative period. However, anesthesiologists have yet to formally incorporate the use of TTE into clinical practice. As such, currently there are no established curriculums to most effectively teach anesthesiology residents basic TTE skills. The objective of this study is to identify the most efficient method of basic TTE training for anesthesiology residents.

**Methods:** Anesthesiology residents rotating through their post anesthesia care unit (PACU) rotation in 2016 and 2017 will be randomly assigned to either cohort A or cohort B. The expected number of residents is 24. Prior to starting their PACU rotation, residents from both cohorts will take a baseline assessment test, comprised of 45 multiple-choice questions consisting of still images, TTE video loops, and standard word based knowledge questions. The endpoint will be the percentage correct of the questions answered. The residents in cohort A will then be provided with an instructional video teaching session covering basic cardiac anatomy, coronary artery anatomy, TTE probe transducer manipulation, and the six basic TTE views. Subsequently, the residents will be taught using the Heartworks TTE simulator how to obtain the same six views. Conversely, the residents in cohort B will take the baseline assessment test but will not be provided with any of the teaching sessions using the simulator as initial exposure to TTE. Instead, cohort B residents will be trained on live patients on the PACU using the same views and for the same duration as those in cohort A. After this initial training, the subjects will re-take the written assessment (on week two of the rotation). In week 3 of the rotation, subjects in cohort A will undergo training on live patients and subjects in cohort B will undergo the simulator training session. Upon the end of the PACU rotation, the participants in both cohorts will be asked to obtain the six views on a healthy standardized volunteer subject and will be evaluated on time to image acquisition and quality of images acquired. The proposed method of assessment of image acquisition: 1. The subject will be asked to acquire 6 basic TTE views: Parasternal short axis, parasternal long axis, parasternal aortic valve short axis, apical four-chamber, apical two-chamber, and subcostal IVC. 2. Time to image acquisition will begin once TTE probe makes contact with standardized patient and end the subject presses the "acquire" button and the image clip is stored.

**Results:** Our results have yet to be collected and analyzed. We hope to identify the most efficient way to train anesthesiology residents on performing and interpreting basic TTE to aid in the management of clinically unstable patients.

**Conclusion:** None thus far.

## ABSTRACT 21

### Food for Thought - A Hands-On Approach to Unveiling Allusions of Culinary Terms in Medicine

**Authors:** Megan Rau MD, Helen Fernandez MD

**Purpose:** Culinary terms are widely used in the field of medicine from pediatrics to pathology. These terms provide a common and relatable description of classic disease manifestations and allow physicians across the world to speak the same language. However, as time progresses the once common and relatable description named after a food item is no longer common. This curriculum was designed to provide physical examples of classic culinary terms commonly used to in medical literature to describe clinical exam, radiological signs, and pathological findings in medicine because the first step in making the diagnosis is being able to recognize the key features. This approach has the ability to transform medical textbook jargon off the page and into the hands of the adult learner.

**Methods:** The curriculum is designed for third year medical students completing their Internal Medicine clinical rotation. The lecture is designed to be one hour in duration. After a brief introduction the students are provided with a blank answer sheet and given 30 minutes to examine 25 food items. They are encouraged to touch, smell and look closely at the items, then try to identify the clinical exam, radiological sign, or pathological finding represented by each item. Furthermore, students are then asked to correlate their findings to specific diseases and list the treatment approach to that disease. The remaining 30 minutes is presented in the form of a discussion where the food and drink items are displayed alongside the actual finding represented.

**Results:** The session was offered to students completing their Internal Medicine rotation. At the completion of the session participants were given a survey composed of 12 questions rated on a 4-point Likert scale. A convenience sample of 53 surveys was collected from four one-hour sessions held in 2014. 85% of students “strongly agreed” the information would be useful for boards and 70% “strongly agreed” they gained new knowledge. 92% of students “strongly agree” they would recommend the presentation to other medical students and 92% gave the workshop an overall rating of “excellent”.

**Conclusion:** Culinary terminology in medicine will continue to be used as descriptors of disease manifestations. The Food for Thought interactive curriculum provides medical trainees the hands-on ability to explore the realm of culinary terms in medicine, moving beyond just the memorization of buzzwords. The next step will be to broaden the reach of the interactive educational session through integration into the Internal Medicine curriculum. Surveys would be given before the session, immediately after the session, and at the completion of the Internal Medicine rotation to assess knowledge gained, retained, and applied. These steps will fulfill the goal of increased recognition of classic disease manifestations and translate into a quick, disease diagnosis for future patients.

## ABSTRACT 22

Standardized Pediatric Cardiology Evaluation Forms Allow For Simultaneous Assessment of Trainee Performance and Program Curriculum Needed To Achieve Entrustable Professional Activities

**Authors:** Frank Lowell MD, Robert Fallar PhD, Srivastava Shubhika MBBS

**Purpose:** Pediatric cardiology fellowships have six defined subspecialty-specific Entrustable Professional Activities (EPAs). Training guidelines published in 2005 and 2015 have defined these EPAs and curriculum but there is no uniform method of assessing fellow's progress and components that will allow achieving these EPAs. To incorporate assessment of EPAs and ACGME/ABP subcompetencies, a national working group was organized through the Society of Pediatric Cardiology Training Program Directors to develop standardized clinical evaluations. This study reports the development, implementation and utility of standardized evaluation forms across all pediatric cardiology programs for better assessment of EPAs, sub-competencies existing curricula components.

**Methods:** Evaluation forms were developed during in concordance with the training guidelines. Six working groups were created: cardiac critical care, acute care and consultation, outpatient care, non-invasive imaging, electrophysiology, and cardiac catheterization. These comprised 24 faculty members from 21 programs. Each form would correlate with a specific EPA; each question would reflect observable behaviors, skills, or knowledge that could be mapped to sub-competencies required by ABP and ACGME. These forms were then incorporated into residency management systems (RMS) and made available to programs for use before the first milestone reporting cycle in fall of 2014. Subsequently, a survey was sent to all programs to assess the quality and utility of the forms.

**Results:** Twenty-five programs responded to the survey. 20% of programs had fewer than 3 trainees, 52% 3-6 trainees, and 28% > 6 trainees. 64% of the programs used the forms. 75% agreed or strongly agreed that the forms were practical and easy for faculty to use and provided useful feedback to the trainees (25% were neutral). 67% responded that the forms were appropriate in length and detail. 44% of the programs responded that there was no existing process in the program that would allow for assessment of certain trainee attributes and behaviors. 65% used their RMS-generated milestone reports with little or no modification; 24% were unaware of this functionality. Survey comments suggested that many programs felt these were an improvement over their previous forms for both milestone assessment and general usefulness. Limitations included difficulty in incorporating the forms into the RMS, incomplete dissemination or adoption amongst the 57 pediatric cardiology fellowships, and lack of utilization of RMS features.

**Conclusion:** Development of standardized evaluation forms allowed for ease of faculty use, useful feedback to trainees, and identification of gaps in the curriculum. To our knowledge, this is the first time there has been a unified effort in developing standardized evaluation tools within a subspecialty. This process will also allow for standardization of the curriculum components and processes across pediatric cardiology training programs. Further revisions of these tools and incorporation into RMS will allow wider acceptance and use.

## ABSTRACT 23

Are we pushing too hard? Resident Satisfaction and Faculty Clinical Productivity

**Authors:** E. Hope Weissler BA, Brijen Shah MD, Peter Taub MD

**Purpose:** The development of clinical productivity-based compensation in academic medical centers has raised concerns about the effects of faculty productivity pressure on graduate medical education. Research on the topic has been limited to single specialties, with mixed results. The authors aimed to explore the effects of formal relative value unit (RVU) targets on graduate medical education across multiple specialties in a single academic medical center.

**Methods:** Department chairs or clinical chiefs from each specialty were queried as to whether physician compensation in their specialty relies on formal RVU goals, whether there are incentives or penalties associated with this goal, and whether there are informal RVU targets of partially or fully productivity-based bonuses. We used the resident responses on the 2014-2015 ACGME survey, which had a 5-point Likert scale. Noncompliance in this tool is defined by the ACGME for each item such that no question has more than 2 noncompliant responses. The faculty supervision and educational content domains were analyzed using independent t-tests with groups defined by whether specialties had formal targets or not, as well as by whether specialties had productivity-based penalties or not.

**Results:** The medicine, pediatrics, general surgery, plastic surgery, anesthesiology, and emergency medicine residencies were included, encompassing 404 resident responses. Three specialties had formal RVU targets, two of which had compensation penalties for faculty not meeting RVU goals. Two of the three specialties without formal RVU goals had potential bonus compensation based off RVUs. 87.78% of residents in programs without formal RVU targets rated their programs as providing sufficient faculty supervision and teaching and 92.56% rated their programs as providing sufficient educational content versus 84.33% and 78.33% respectively in programs with formal productivity targets. There were no differences in these percentages for either faculty supervision and training ( $p=0.779$ ) or educational content ( $p=0.149$ ). When programs were divided by whether there was a penalty for faculty failing to meet productivity goals, there were also no differences in faculty supervision and teaching (83.97% versus 90.83%,  $p=0.852$ ) or educational content (85.83% versus 84.67%,  $p=0.883$ ) domains.

**Conclusion:** Concerns about negative effects of productivity-based compensation on graduate medical education were not born out in this study based on ACGME survey responses. Given the small number of residencies included, it is likely that the study was underpowered, and more residencies will be included in the future. Next steps would be to triangulate this data with the faculty surveys from these programs. Finally, the results of this study do not obviate the need for ongoing discussion of the positive and negative effects of productivity-based compensation on graduate medical education.

# **CURRICULUM (UMIE)**

**ABSTRACTS 24 – 29**



## ABSTRACT 24

### Designing and Implementing a Medical School Elective to Enhance Student Understanding of Gender Identity, Sexual Orientation, and Sexual Health

**Authors:** Elizabeth Tarras BA, Scott Jelinek MPH

**Purpose:** The median number of teaching hours dedicated to LGBT content during pre-clinical and clinical medical education is only 5 hours. When medical schools do attempt to teach LGBT content, it is often one-dimensional and non-intersectional. Teaching sexual health in the context of sexual and gender minority health is even more challenging given the layers of stigma attached not only to identity, but also to expression and behavior. Current medical school curricula are inadequate at assuring students are competent and comfortable addressing topics of gender identity, sexual orientation, and sexual health with their patients. We thus designed a specialized sexual health elective, 'Sex and Health,' to enhance understanding of sexual health issues in sexual and gender minority communities and to help students identify their attitudes and biases on various sexual health topics in order to promote healthy sexualities and provide the knowledge and skills to manage sexual concerns of their patients. This elective was successfully implemented at the Icahn School of Medicine at Mount Sinai during 2014 and 2015 as a Nexus course.

**Methods:** The elective consisted of ten 90-minute sessions. The topics included: providing healthcare for LGBTQ people involved in the sex trade; providing healthcare for transgender and gender nonconforming individuals; the history of racism and sexuality in the United States; sex and (dis)ability; kink, BDSM and sex; sex toys and pleasure; and providing inclusive sexual health education for people who are asexual. The format included expert presentations, small group discussions, workshops, and optional field assignments. Key sessions were developed as large lectures opened up to the entire Mount Sinai community to pilot content to maximize exposure to neglected topics and to develop general curriculum materials.

**Results:** The elective has been successful at increasing students' knowledge about gender identity, sexual orientation, and sexual health in a dynamic and intersectional manner beyond the education received in the formal medical school curriculum. Currently, we are working to adapt and integrate some sessions into the traditional pre-clinical and clinical medical curricula to ensure that all students are exposed to these important concepts.

**Conclusion:** Increasing medical students' exposure to, and critical engagement with, issues of sex, sexuality, and gender identity and expression is critical to building the next generation of competent, knowledgeable, and affirming physicians. Current medical school curricula does not adequately address these topics and so students have developed outside options for students to learn about these issues. Moving forward, it is important that Medical Education departments partner with students and healthcare leaders to integrate this material from outside the classroom into the classroom.

## ABSTRACT 25

### Comparing Clinical Diagnostic Inference and Statistical Inference among Medical Students

**Authors:** Mohsin Ali MPhil, Kipp Johnson BS, Sheiry G. Dhillon BHSc, Christina M. Wyatt MD MS, Robert Fallar PhD

**Purpose:** Interpreting a statistical test of a research study is analogous to interpreting a clinical diagnostic test of a patient, as both involve Bayesian reasoning. Our objective was to investigate whether medical students differentially interpret results of clinical diagnostic tests versus statistical tests.

**Methods:** From September through October 2015, we surveyed medical students at our institution with an online questionnaire. Using multiple-choice questions, we assessed students' understanding of clinical diagnostic and statistical concepts; this included four scenario-based questions to assess inference—two for clinical diagnostic inference, and two for statistical inference. Demographic and educational variables were analyzed as predictors of higher clinical diagnostic and statistical inference scores using ordinal logistic regression. In addition, we conducted semi-structured interviews of students whose clinical diagnostic and statistical inference scores represented their year's most common response in order to understand their reasoning process.

**Results:** A total of 259 of 565 (46%) medical students completed the survey. Among respondents, median age was 25 years (range, 21–36 years), and 124 (48%) were female. There were 64 MS1, 109 MS2, 39 MS3, and 46 MS4 students. A total of 164 (63%) students reported prior training in epidemiology, biostatistics, or evidence-based medicine, and 63 (24%) students already had, or were concurrently obtaining, an advanced degree. A total of 150 (58%) students correctly interpreted the positive predictive value, and 177 (68%) students correctly interpreted the p-value. A total of 121 (47%) students correctly answered both clinical diagnostic inference questions, whereas 47 (18%) correctly answered both statistical inference questions. Medical school year was the only significant predictor in our analyses; upper-year students were more likely to answer clinical diagnostic inference questions correctly ( $P_{\text{trend}} < 0.001$ ), but there was no significant trend observed between medical school year and correctly answering statistical inference questions ( $P_{\text{trend}} = 0.054$ ). Confidence in understanding concepts of clinical diagnostic concepts was higher among students who answered more clinical diagnostic questions correctly ( $P < 0.0001$ ), whereas confidence in understanding concepts of statistical inference was not associated with answering more statistical questions correctly ( $P = 0.059$ ). A total of 51 (20%) respondents agreed to the follow-up interview. Fifteen students have been contacted to date, among whom 13 students have to date been interviewed. Students with higher clinical diagnostic inference scores have referred to the Bayesian prior (“clinical context”) in describing their reasoning.

**Conclusion:** Upper-year medical students were better at answering clinical diagnostic inference questions, but there was no correspondingly significant improvement by year for statistical inference. This improvement may relate to increased clinical exposure predisposing students toward Bayesian reasoning. Further interviewing and qualitative analysis may help elucidate why this difference between clinical diagnostic and statistical inference exists, which in turn may inform whether emphasizing the similarities between clinical diagnosis and statistics could be a useful addition to the medical curriculum.

## ABSTRACT 26

### Health and Human Rights: An Introductory Curriculum for Second-Year Medical Students

**Authors:** Holly Atkinson MD, Salina Bakshi MD, Megan Sacco BA, Reena Karani MD, MHPE

**Purpose:** There have been numerous calls in the medical literature for formal curricular instruction on health and human rights and how these underpin the social determinants of health and influence health outcomes. We aimed to provide second year medical students with the knowledge and skills to analyze, explore, and appraise the ideas and conflicts in health and human rights that are encountered in the practice of medicine today.

**Methods:** “InFocus” is a series of eight weeklong educational experiences that are part of the formal curriculum. The third InFocus week, Health and Human Rights (H&HR), is taught in the fall of second year to all 140 medical students and comprises 12 hours of instruction. Using Kern’s principles of curriculum design, we focused the H & HR curriculum on four key areas: 1) a basic introduction to human rights; 2) the ethical problem of dual loyalty; 3) the role of research in documenting HR violations; and 4) clinical skills for medically evaluating asylum seekers. Instructional methods included didactic sessions, clinical exposures and breakout workshops to engage adult learners and stimulate experiential learning. We evaluated the first offering of the course through quantitative and qualitative assessment of student satisfaction (Kirkpatrick level 1) via an electronic survey in six key domains.

**Results:** Overall, 137 of 140 students completed the course evaluation. Ratings of domains were on a scale of 1-5 (1=very dissatisfied to 5=very satisfied). Quantitative ratings were as follows: 1) clarity of course objectives: 3.73; 2) quality of teaching: 3.72; 3) quality of lectures in facilitating learning: 3.71; 4) amount of instructional content to allow mastery of core knowledge: 3.67; 5) course organization: 3.51; and 6) overall course quality: 3.50. Qualitative results from open-ended queries were analyzed and coded to reveal the following: 47% commented on the overall course (clear and well-defined objectives, well-organized, interesting and important topics); 34% on the faculty (choice was excellent, interesting and engaging, dynamic and diverse); 24% on the breakout workshops (range of fascinating topics, excellent, informative and interactive, great discussions with classmates); 15% on the lectures (interesting and informative, knowledgeable and engaging); 14% offered general comments (very good job, interesting, much improved from previous InFocus weeks); 14% on the overall curriculum (good balance of small groups and lecture, variety in instructional format.)

**Conclusion:** The H&HR curriculum received positive feedback from students. A weeklong immersion course appears to be a successful method for introducing pre-clinical medical students to the field of health and human rights. We will use students’ feedback from this course offering to enhance the next offering of the H&HR experience and to further develop subsequent programming for the InFocus week centered on translating global health and human rights issues into advocacy and action.

## ABSTRACT 27

### Student High Value Care Committee: A Model for Student-Led Implementation

**Authors:** Hyung (Harry) Cho MD, Celine Goetz MD, Andrew Dunn MD, John Di Capua MHS, Irene Lee BS, Sonya Makhni BS, Deborah Korenstein MD

**Purpose:** Formal curricula for teaching medical students high value care are lacking, and there is little investigation to identify strategies that can effectively impact the knowledge and skills of students. Research is needed to develop models for student-led HVC implementation in healthcare settings.

**Methods:** We created a Student High Value Care (sHVC) Committee, led by two student Co-Chairs paired with two faculty Co-Directors. All medical students at Icahn School of Medicine were invited to apply to join the committee. The sHVC longitudinal initiative focused on six core elements: (1) Student leadership (2) Peer learning group, (3) Faculty mentorship, (4) Institutional and data support, (5) Curriculum for value improvement, and (6) Scholarship.

**Results:** Twenty-one students were accepted to the committee. The students were divided into three teams, each paired with a faculty mentor. Small team brainstorming sessions enabled student-led selection of a topic related to overuse (e.g. reducing “daily labs”) and development of innovative ideas for implementation of a project to reduce overuse. Committee time is split between reporting on progress, and also for delivery of a formal Student Value Improvement Curriculum (sVIC). The curriculum encompasses objectives in (1) Scholarship, (2) Leadership, and (3) Value and Safety Improvement. Scholarship objectives include: frame a practical value improvement project, write an abstract, deliver an oral presentation of a poster, submit exempt and expedited protocol review to IRB and understand the basics of survey design. Leadership objectives include: deliver a presentation to faculty and administration, build a relationship with a mentor, work in multidisciplinary teams and utilize principles of change management. Value and Safety Improvement objectives include: understand and use Plan-Do-Study-Act cycles for change, use tools of QI (fishbone, process map, run chart, etc.), set SMART (Specific, Measurable, Achievable, Realistic, Time-bound) goals, identify the drivers of overuse, define value, quality and cost and apply principles of just culture in safety. After four months of meetings, groups presented their projects at the “sHVC Innovations Pitch Day” and faculty offered feedback. The sHVC Committee has led to creation of a sHVC website, social media outreach efforts, and obtaining an official Icahn School of Medicine student organization status. We are currently formalizing this initiative into a medical school elective.

**Conclusion:** The sHVC Committee and sVIC allowed for student-led experiential learning on high value care and created the structure and support for implementation of meaningful projects at our institution.

## ABSTRACT 28

### Medical Students' Reflections of a Post-Hospital Discharge Patient Visit

**Authors:** Linda Pang MD, Reena Karani MD MHPE, Sara Bradley MD

**Purpose:** Transitions across care settings are common and often a vulnerable time for patients, especially older adults. Communicating the key components of a safe discharge plan is one of the AAMC Geriatric Competencies for medical students. Our prior study evaluated the effectiveness of a transitions of care curriculum for medical students on their knowledge, skills, and attitudes. The aim of this study is to identify lessons learned by third year medical students on a post-discharge visit.

**Methods:** Third year medical students at one academic institution completing their Internal Medicine-Geriatrics Clerkship between 2012 and 2014 completed post-discharge visits of patients they cared for in the hospital. Afterwards, students participated in a small group debriefing of their experience facilitated by two physicians and completed an individual reflection exercise. Debriefing sessions were recorded and transcribed verbatim. Qualitative analysis was used to extract themes from student discussions guided by several reflective questions.

**Results:** 262 students participated in the debriefing sessions and contributed 451 comments. The authors characterized their responses into 7 domains and 29 themes within those domains. Major domains identified included problems related to hospitalization, discharge transition, factors which helped or hindered transition, patients' experience at home, skilled nursing facilities, readmissions, and potential solutions. Within the domain of hospitalization, students noted a major theme of a fragmented healthcare system resulting in care inefficiencies. Within the domain of discharge transition, students noted 3 major themes including medication errors, problems with the written discharge summary, and lack of understanding by the patient of parts or all of the hospitalization. Within the domain of factors which helped or hindered transition, students identified major themes of caregiver support, health literacy, and home services. Within the domain of patients' experience at home, students noted patients' increased independence and change in power dynamic. Within the domain of skilled nursing facilities, students noted the setting to be similar to a hospital. Within the domain of readmissions, students noted a theme of unavoidable readmissions for some serious conditions. Within the domain potential solutions, main themes students identified included strategies to enhance patient education during hospitalization, increase clarity in the written discharge summary, and improve medication adherence on discharge.

**Conclusion:** Medical students were able to identify multiple problems surrounding patients' discharges and factors that contribute to making a transition successful. The issues identified are consistent with problems noted in patient safety literature. The students were also able to articulate solutions to these barriers. This study shows that a model combining reflection with experiential learning can be used to teach medical students about key components of safe transitions of care.

## ABSTRACT 29

### The Future of Plastic Surgery: Student Interest in Plastic Surgery in the Early Medical School Years

**Authors:** E. Hope Weissler BA, Peter Taub MD

**Purpose:** Though applicants and residents have been surveyed about their motivations in pursuing plastic surgery, little is known about first and second year students' interest and concerns. The authors sought to characterize younger students' motivations and concerns.

**Methods:** An electronic survey was distributed through the plastic surgery interest group (or general surgery interest group if necessary) at seven schools in the New York area. The survey consisted of a demographic survey, a series of Likert-type questions assessing agreement with positive and negative statements about plastic surgery, and an item assessing personality traits and attributes students associate with plastic surgeons.

**Results:** Fifty-seven students completed the survey. Forty-six were interested in plastic surgery as a career, of which 83% were first years. Among these 46 students, participation in plastic surgery-related activities was low (0.61 average activities participated in) regardless of whether the student's medical school had a plastic surgery residency. The 12 students who rated their interest  $\geq 4$  out of 5 were similar to less-interested students in terms of gender, year in school and presence or absence of plastic surgery residency at their school. The most agreed-with reasons for pursuing plastic surgery were the opportunity to use one's hands (average 4.42/5). The most agreed-with reason to not pursue plastic surgery was the competitiveness of the match (3.95/5). 32 students (70%) ranked fine motor skills among the top three most important attributes of a successful plastic surgeon, 24 ranked creativity (52%), and 12 ranked reliability (26%). Only 6 students thought honesty, and 1 leadership skills, were among the top three most important attributes.

**Conclusion:** Continued innovation and excellence in plastic surgery require the best possible applicants. The low levels of plastic surgery-related activity and pervasive student anxiety about the competitiveness of the Match suggest that more effective outreach could be targeted towards young students. Future steps include a more complete accounting of interest in plastic surgery among a broader population of medical students and a better understanding of how this interest changes with time.

# **MILESTONES/ COMPETENCIES**

**ABSTRACTS 30 – 33**

## ABSTRACT 30

### Development of a Tool to Assess Outpatient Handoffs as an Entrustable Professional Activity: A Pilot Project

**Authors:** Lisa Auerbach MD, Christina Cruz MD, Desiree Chow MD, A.J. Guarino PhD

**Purpose:** Each year, thousands of internal medicine residents graduate and responsibility for their primary care patients is transferred to junior residents. These transfers of care, or handoffs, are often unstructured, and carry inherent risk for patients. Both the Accreditation Council of Graduate Medical Education (ACGME) and the Alliance for Academic Internal Medicine (AAIM) have mandated competence in patient handoffs. Additionally, the Society for General Internal Medicine's (SGIM) competency work group has included safe handoffs in their list of 25 key Primary Care Medical Home Entrustable Professional Activities (EPA) for internal medicine residents. However, there are no published curricula or systems to facilitate these transfers of care. Easy to use assessment tools are needed to aid residency programs in the direct observation of their residents. Our aim was to develop a direct observation assessment tool for end of residency handoffs in the ambulatory setting.

**Methods:** We developed an observation tool for end of residency handoffs by adapting a tool developed for inpatient pediatric handoffs using the ABIM milestone frameworks along with AAIM milestones and EPAs. The eight assessment items include Patient Summary, Medical Problems, Social Problems, Health Maintenance, Pending Studies, Follow-up Recommendations, Interactive Questioning and Transfer of responsibility. For the grading rubric, we used a Likert scale with five categories, with a score from 1-5 for each category, modeled after ten Cate's Levels of Entrustment. We piloted a new handoff protocol with 10 pairs of internal medicine residents. Graduating residents were paired up with current interns. Each handoff was observed by two trained raters, using our tool to assess the residents. A total of 100 handoffs were observed. The observers scored each resident on the 8 different items. The primary statistical analysis was guided by Generalizability Theory (G-theory), using the following variance components, (a) resident (b) rater, (c) item, (d) Resident by Rater, (e) Resident by Item, (f) Rater by Item, and (g) Resident by Rater by Item.

**Results:** We found that our raters demonstrated impressive overall consistency in grading the residents. Although resident performance varied for different assessment items, the standard error for any given item was less than 0.1, corroborating rater consistency. We used the Generalizability Theory statistical framework to evaluate sources of variance and the interactions between them. There was little variance among the raters, as well as in their interactions with residents and the performance items. The performance items were the primary source of variance.

**Conclusion:** These results showed that our raters were able to consistently observe and assess residents performing an important entrustable professional activity using an anchored assessment tool. Future work needs to be done to validate this observation tool and mitigate variance.



## ABSTRACT 31

### Is Granny Really Safe on July 1? Evaluating the Impact of Medical Student Geriatric Competencies in Internal Medicine Residents

**Authors:** Erica Chu MD, Christine Chang MD, William Hung MD

**Purpose:** The Minimum Geriatric Competencies for medical students were published in 2009 to ensure competent care to older patients by new interns. Despite the introduction of these competencies, it remains unclear if changes in medical school curricula to achieve these goals are bearing fruit. In this study, internal medicine (IM) residents were surveyed to determine if the shifts in medical student education are leading to a greater appreciation for geriatrics specialty knowledge and an improved level of preparedness to care for the older adult.

**Methods:** From December 2005 to 2015, all second-year IM residents were administered a survey evaluating their ability to diagnose and manage patients with dementia, falls, and urinary incontinence. This survey included a 28-item questionnaire examining attitudes (e.g. “It is important for me to learn how to workup and manage dementia”), fund of knowledge (e.g. “I can list the reversible causes of dementia”), and comfort with management (e.g. “I feel comfortable treating dementia”). Each item was graded on a 5-item Likert scale ranging from strongly agree to strongly disagree. We examined the frequency of responses and performed a non-parametric trend test (nptrend) similar to the Wilcoxon rank-sum test to evaluate the trend of responses across academic years. Stata Version 12.1 was utilized for analyses.

**Results:** 376 residents completed the survey between 2005 and 2015 with a mean of 37.6 residents [SD=6.5] per academic year. 48.5% were male with a mean age of 28.7 years [SD=2.1]. Overall, 35.8% of residents completed a clinical geriatrics rotation during medical school with no statistically significant trend of change over time ( $p=0.97$ ). Responses to the majority (78.6%) of the questionnaire items had no significant change over time, but responses to 6 of the 28 self-efficacy questions yielded a statistically significant trend over time from positive proficiency (strongly agree or agree) to negative proficiency (not sure, disagree, or strongly disagree). These questions involved diagnosis of dementia ( $p=0.036$ ), pharmacologic therapy (for cognitive symptoms of dementia,  $p=0.020$ ; behavioral symptoms of dementia,  $p=0.023$ ; urinary incontinence,  $p=0.028$ ), and management of falls (when to refer to specialists,  $p=0.006$ ; formulating a treatment plan,  $p=0.021$ ).

**Conclusion:** Significant gaps in the self-reported knowledge of our IM residents suggest that medical schools have not yet succeeded in teaching the medical student geriatric competencies. Data from this survey over the past decade reveal responses that are largely unchanged but with some items indicating a worsening trend in perceived expertise. Limitations of this study include the single center design and small study population comprised only of IM residents, which may reduce generalizability. Further studies are needed to elucidate the reasons for this trend and ensure that the geriatrics education of our students and residents becomes reality.

## ABSTRACT 32

### Development of a Comprehensive Quality and Patient Safety Curriculum

**Authors:** Brian Markoff MD, Jonathan Arend MD, Lauren Peccoralo MD, Brijen Shah MD

**Purpose:** The rapidly changing U.S. healthcare system requires an equally rapid change in how we educate future clinicians. In recognition of this, the ACGME has implemented the Clinical Learning Environment Review (CLER) program and the Milestone Project as a part of its Next Accreditation System. Three major aspects of the CLER program are resident education in and involvement with patient safety, healthcare quality, and care transitions. In addition to those areas, we felt a working overview of new payment structures and population health, as well as an introduction to the principles of leadership, were key aspects missing in our curriculum. Therefore, we developed a new curriculum to teach the key concepts of clinical quality and patient safety to all Internal Medicine residents to prepare them for practice in a value-based healthcare system. The purpose of our study is to assess the impact of this curriculum on resident knowledge, skills and attitudes about healthcare quality and safety as well as on their future clinical practice.

**Methods:** Building on existing resident curriculum at Mount Sinai, curriculum at other institutions, and the CLER objectives, we instituted a new, more comprehensive curriculum for 2015-2016 designed around five fundamental components of care critical to a physician in a future-state, value-oriented healthcare system: 1. Fundamentals of Quality Improvement; 2. Errors and Systems Analysis; 3. Care Transitions; 4. Health Systems; and 5. Leadership. The curriculum is comprised of didactics, practical exercises and clinical exposures delivered during outpatient and inpatient blocks and are spread across the first, second, and third year of residency, with each year building on the prior. Building on existing resident curriculum at Mount Sinai, curriculum at other institutions, and the CLER objectives, we instituted a new, more comprehensive curriculum for 2015-2016 designed around five fundamental components of care critical to a physician in a future-state, value-oriented healthcare system: 1. Fundamentals of Quality Improvement; 2. Errors and Systems Analysis; 3. Care Transitions; 4. Health Systems; and 5. Leadership. The curriculum is comprised of didactics, practical exercises and clinical exposures delivered during outpatient and inpatient blocks and are spread across the first, second, and third year of residency, with each year building on the prior.

**Results:** We are currently working on our evaluation of the program as above but do not have data to report as yet. The aspects of the curriculum prior to this academic year all received high marks in end of year surveys of the residents.

**Conclusion:** Teaching quality improvement, error analysis, systems analysis, care transitions, health system fundamentals, and leadership skills during residency is no longer optional. We hope our curriculum will be effective in improving resident knowledge, skills and attitudes about healthcare quality and safety as well as impact their future clinical practice.

## ABSTRACT 33

### Self-Assessed Confidence in Residency Training Programs

**Authors:** Joel Idowu MD, Saira Pasha MD, Lalanthica Yogendran MD, Simarpreet Kaur MD

**Purpose:** A resident physician's level of academic achievement and confidence in their respective field guides departments in conducting appropriate interventions in the residency education process. These levels can be measured by personal evaluation of self-esteem, or the feeling of having being secure in one's own abilities, as well as self-efficacy, defined the belief in a person's capacity to execute behaviors necessary to produce specific performance attainments. The aim of this study was to conduct a survey across all graduate medical education specialties at Richmond University Medical Center (RUMC), and correlate residents' self-esteem and self-efficacy with their year of training, field of study, and demographics.

**Methods:** The general self-efficacy scale and the Rosenberg self-esteem scale (RSE) were used to create the survey. The General Self-Efficacy Scale (GSE) is a 10-item psychometric scale that is designed to assess optimistic self-beliefs to cope with a variety of difficult demands in life. The RSE Scale is a 10-item scale that measures global self-worth by measuring both positive and negative feelings about self. The survey questions were modified to be specific for the resident training population and an anonymous survey was created using Survey Monkey. The self-efficacy and self-esteem surveys were scored and correlated to the demographic and psychosocial data points to determine impact.

**Results:** The general self-efficacy scale and the Rosenberg self-esteem scale (RSE) were used to create the survey. The General Self-Efficacy Scale (GSE) is a 10-item psychometric scale that is designed to assess optimistic self-beliefs to cope with a variety of difficult demands in life. The RSE Scale is a 10-item scale that measures global self-worth by measuring both positive and negative feelings about self. The survey questions were modified to be specific for the resident training population and an anonymous survey was created using Survey Monkey. The self-efficacy and self-esteem surveys were scored and correlated to the demographic and psychosocial data points to determine impact.

**Conclusion:** There is a significant increase in self-esteem and self-efficacy in the fourth year of training. This supports the hypothesis that stated there is a linear increase in self-esteem as residents progress through their training, and can reflect their increased effectiveness and ability to perform independently. A variety of factors such as the level of residents' stress in the higher risk specialties, and quality of the training program may explain the higher scores reported by Psychiatry residents, and the lowest in Radiology and potentially Obstetrics.

# **GLOBAL HEALTH**

## **ABSTRACTS 34 – 36**

## ABSTRACT 34

### Introducing Global Health as a Core Component of First-Year Medical Education

**Authors:** Renee Bischoff MPH, Natasha Anandaraja MD, Darinka Gadikota-Klumpers PhD, Megan Sacco BA, Reena Karani MD, MHPE

**Purpose:** The Icahn School of Medicine at Mount Sinai is one of only few medical schools nationwide that has committed core curricular time to teaching global health and social justice content. This reflects Mount Sinai's longstanding commitment to these areas and our beliefs that all medical graduates should be aware of global disparities in healthcare access and health outcomes, must be conscious of the populations that are disproportionately vulnerable to disparities, and need to appreciate their role in improving health globally. To achieve this, we provided first year medical students with an introduction to the major issues and approaches relevant to global health today.

**Methods:** “InFocus” (IF) is a series of eight weeklong educational experiences that are part of the formal curriculum. The second InFocus week, Global Health, is taught in the winter of the first year to all 140 medical students and comprises 15 hours of instruction. The course was launched in 2014 and is now in its third iteration. Instructional methods include didactic sessions and breakout workshops to engage adult learners and foster experiential learning. We evaluated the course in 2014 and 2015 through quantitative and qualitative assessment of student satisfaction (Kirkpatrick level 1) via an electronic survey in six key domains.

**Results:** In 2014 and 2015, 140 and 138 of 140 students completed the course evaluation respectively. Ratings of six key domains were on a scale of 1-5 (1=very dissatisfied to 5=very satisfied). Quantitative ratings in 2014 and 2015 respectively are as follows: 1) clarity of course objectives: 3.90 and 3.96; 2) quality of teaching: 4.02 and 3.83; 3) quality of lecture in facilitating learning: 4.01 and 3.97; 4) amount of instructional content to allow mastery of core knowledge: 4.08 and 3.87; 5) course organization: 4.09 and 3.75; and 6) overall course quality: 3.90 and 3.70.

**Conclusion:** In its first two years, Global Health InFocus received strong positive feedback from participants. Based on feedback, the curriculum has evolved to include opportunities for field visits to global health-related organizations around New York City as well as more small group interactive sessions.

## ABSTRACT 35

### Near-Peer Teaching for Sustainable Capacity Building of Basic Life Support Training in Haiti: Feasibility of a Training the Trainers Model

**Authors:** James Murphy MPH, Vivian Nguyen MPH, Alisse Hannaford BS, Allison Lockwood BA, Leela Chockalingam BS, Brett Marinelli BA, Randy Sorge MD, Benjamin Schnapp MD, Dinali Fernando MD

**Purpose:** In 2013, Medical Students for Haiti (MS4H) developed a 'near-peer' teaching module for Universite Quisqueya in Port-au-Prince, Haiti. Each year, American medical students and emergency medicine residents, certified by the AHA as Basic Life Support (BLS) instructors, train and certify Haitian medical students as BLS providers. The program was designed to complement medical education at Universite Quisqueya where BLS is not taught to students, despite student desire for the certification and the need for improved first responder capacity in Haiti. This year a 'Training the Trainers' model, designed to enhance sustainable capacity-building, was piloted.

**Methods:** Six previously BLS-certified Haitian students were trained as BLS instructors. Then, mean BLS certification-exam scores of students new to BLS taught by Haitian peers (12) were compared to new students taught by MS4H (39) using an unpaired t-test.

**Results:** Haitian-taught students' mean scores were 90.0% (SD=10%), compared to 87.6% (SD=11%) for MS4H-taught students. Of those taught by Haitian peers, two students (16.7%) required remediation compared to 9 students (23.1%) who were taught by MS4H. An unpaired t-test yielded no significant differences between the two groups' scores ( $p=0.67$ ). Demographic data to control for confounders was unavailable, but all students tested were being trained in BLS for the first time.

**Conclusion:** Our results demonstrate that a "Training the Trainers" model, where we train Haitian medical students as BLS instructors, may be feasible and equivalent to direct BLS training by American medical students and residents trained by the AHA as BLS instructors. In future years, larger scale studies need to be done to validate this pilot study. If validated, this teaching method can advance further sustainable BLS teaching programs at Université Quisqueya and other medical centers in Haiti.

## ABSTRACT 36

### Expectations and Outcomes for the Development of an Ultrasound Curriculum in a Resource-limited Environment

**Authors:** Rachel Berkowitz MD, James Mangan MD, Gabriel Rose DO, Sebastian Siadecki MD, Kyle Cramer MD, Ramona Sunderwirth MD, Kajal Chhaganlal MD, Turandot Saul MD

**Purpose:** Point-of-care U/S can be an invaluable tool in resource-limited settings. EM physicians from developed countries are increasingly traveling to these areas to teach U/S courses or establish U/S programs. However, how to best perform a needs assessment and develop a curriculum can be unclear when entering an unfamiliar environment. Our objective was to determine if course directors could design appropriate didactics based on limited knowledge of Mozambican medical students' backgrounds and needs, and if surveying novice learners beforehand would be instructive.

**Methods:** A group of American EM physicians traveled to Mozambique to teach a 3-day U/S course for 20 5th-year medical students, and to spend time as observers in their hospital. The curriculum included lectures on 12 topics followed by hands-on practice. It was developed by 4 U/S-trained physicians based on experience conducting courses in developed countries and research on regional disease patterns and medical education. A survey was administered to these instructors before and after the course. Students were given a similar survey at the same times and one month later. The survey collected information about perceptions of local morbidity and the utility of different U/S modalities.

**Results:** Overall, instructors accurately identified the diseases perceived by students as most prevalent and deadly; however they overestimated the extent of OB complications, trauma, and infectious diseases other than HIV, TB, and malaria. Instructors rated FASH, OB, and IV access as the most useful U/S modalities before the course, and thoracic and procedural guidance highest after the course. Students rated cardiac and late OB highest before the course. Afterwards, answers were more evenly distributed, but one month later, they again favored cardiac and OB. No students rated IV access or procedural guidance highly at any time. 33% recommended adding transcranial U/S.

**Conclusion:** Based on limited knowledge, instructors designed a course for medical students that was well-received; however, on comparison of instructors' pre-course answers to students' and their own post-course answers, the curriculum could have been improved. It may be appropriate to consider students' input before training. This and other methods of needs assessment need further investigation.

# **PATIENT SAFETY**

## **ABSTRACTS 37 – 41**



## ABSTRACT 37

### An Educational Intervention to Improve the Use and Monitoring of Vancomycin in Pediatric Patients

**Author:** Sejal Bhavsar MD, Gail Shust, MD

**Purpose:** In 2009, recommendations for monitoring vancomycin were published based on consensus from the American Society of Health-System Pharmacists, the Infectious Disease Society of America and the Society of Infectious Diseases Pharmacists. We have observed variable adherence to these recommendations at Kravis Children's Hospital at Mount Sinai, in part, due to a gap in knowledge by our pediatric residents regarding appropriate monitoring and dose adjustment in response to vancomycin trough levels. We aim to improve the monitoring and dose adjustment of vancomycin through an educational intervention for pediatric residents.

**Methods:** A presentation regarding vancomycin monitoring and dosing was presented at noon conference and emailed to those unable to attend. Residents were asked to complete pre- and post-intervention surveys with clinical scenarios and questions regarding their comfort level with vancomycin monitoring and dose adjustment. Charts of patients admitted to the PICU, P4 or P5 were reviewed 6 months prior to the intervention and data was collected, including timing of baseline creatinine levels and vancomycin troughs. Dose adjustments were also reviewed. We are in the process of monitoring vancomycin administration for 6 months post-intervention.

**Results:** 22 pre-test and 14 post-test surveys were completed. On pre-test, 5% of residents reported feeling uncomfortable with adjusting vancomycin doses based on subtherapeutic troughs and 27% reported feeling uncomfortable adjusting for suprathreshold levels. On the post-test, 100% of participating residents reported feeling somewhat or very comfortable adjusting vancomycin doses based on subtherapeutic levels and 3% felt uncomfortable adjusting dosing based for suprathreshold levels ( $p < 0.05$ ). 115 patients were included pre-intervention, and thus far, 34 patients are included in our post-intervention analysis. Baseline creatinine levels were obtained in 87% of patients pre- and 100% of patients post-intervention ( $p < 0.05$ ). Vancomycin troughs were obtained prior to the 4th dose in 65% of patients pre- and 88% post-intervention ( $p < 0.05$ ). In the pre-intervention group, of the 73 patients who had vancomycin troughs obtained appropriately, 34% had therapeutic levels, 55% had subtherapeutic levels with doses changed accordingly, and 11% with subtherapeutic levels had no change despite its indication. In the post-intervention group, of the 27 patients who had vancomycin troughs obtained appropriately, 52% had therapeutic levels, 41% had their doses changed due to subtherapeutic levels, and 7% should have had their doses adjusted but did not ( $p = 1$ ). In the pre-intervention group, 5 patients had suprathreshold troughs ( $> 20$ ). 3/5 had their next dose held. In the post-intervention group, 3 patients had troughs  $> 20$ . 2/3 had their next dose held ( $p = 1$ ).

**Conclusion:** We are continuing our post-intervention analysis through April 2016. The first two months of post-intervention data have shown a statistically significant improvement in obtaining baseline creatinine levels and vancomycin troughs at appropriate times. There is no significant difference between dose adjustment based on troughs pre- and post- intervention.

## ABSTRACT 38

### Helping Housestaff with Handoffs: Impact of a Novel Handoff Tool and Direct Observation on Resident Internal Medicine Handoff Performance

**Authors:** Sarah Lieber MD, Eric Goodman MD, Leslie Lee MD, Julie Pearson MPH, Brijen Shah MD

**Purpose:** Day-to-night inpatient handoffs are high-risk clinical moments with potential for miscommunication and error. Historically, handoffs performed by Internal Medicine residents at our institution were not standardized and there was little workplace-based performance feedback. The primary goal of this study was to evaluate the impact of a novel standardized handoff tool, direct handoff observation, and performance feedback on handoff quality. We also investigated the impact of team and environmental factors such as number of patients, handoff pace, and handoff location on the quality of handoff encounters.

**Methods:** Inpatient medical teams were observed performing day-to-night handoffs during the baseline (January-April 2015) and intervention (April-June 2015) periods. The intervention consisted of an electronic handoff tool that prompted providers to write a patient summary, to-do list, and critical take-home messages, and provided system-specific anticipatory guidance for potential overnight events. Feedback was provided on an ad-hoc basis during the baseline period and uniformly during the intervention period. Team performance was evaluated for 11 behaviorally-anchored domains based on best practices, and each behavior was rated on a 4-point scale (behavior exhibited for all, most, some, or no patients on the team) using a rubric adapted from the literature. The primary outcome was each team's composite score, expressed as a percentage of 44 possible points. The impact of the handoff intervention and categorical factors (service type, handoff location, handoff pace) were assessed using ANOVA/T-tests. Continuous predictors (number of patients/team, number of providers/team, patient-to-provider ratio) were assessed by generalized linear models. Multivariate generalized linear models were used to assess the impact of significant univariate predictors.

**Results:** Observations included 99 teams during the baseline period and 52 teams during the intervention period. Feedback was provided to 55% of teams at baseline, and 100% of teams during the intervention. The composite performance score increased from 72.5% at baseline to 92.3% during the intervention ( $p < 0.0001$ ). The number of patients per team was inversely related to performance, with each additional patient associated with a 1.73% decrease in score ( $p = 0.0002$ ). Service type predicted performance ( $p = 0.05$ ); general medical teams performed worse than subspecialty or mixed general medical/subspecialty teams. Ideal handoff pace was associated with higher scores than slow or fast pace ( $p < 0.0001$ ), and handoffs performed in a dedicated room were associated with higher scores than those performed in the hallway ( $p < 0.0001$ ). In the multivariate model, implementation of the handoff intervention remained the strongest predictor of performance.

**Conclusion:** A novel intervention consisting of a structured handoff tool, direct observation, and feedback of resident handoffs improved handoff quality. Improvement was independent of team census, handoff location, and handoff pace. These results suggest that the tool in combination with direct observation may improve adherence to best practices. Further research is needed to evaluate whether this multimodal intervention decreases adverse events.

## ABSTRACT 39

### Insulin Prescribing Skills among Internal Medicine Residents during Transition of Care from the Hospital to Outpatient Setting

**Authors:** Medha Satyarengga MD, Esra Kalkan MD, Sylvaine Frances PA-C, Francisco Perez-Mata MD, Rodolfo J Galindo MD

**Purpose:** Errors in prescribing insulin and insulin-related supplies during transition-of-care from the hospital to outpatient settings have been associated with increased readmission, morbidity, and mortality. Accordingly, we assessed insulin prescribing skills among internal medicine (IM) residents when discharging patients with diabetes on insulin therapy.

**Methods:** An anonymous survey of multiple-choice questions was distributed among IM residents at an academic medical center in September 2015. Insulin prescribing skills were assessed by overall comfort level, whether prescriptions of insulin-related supplies (e.g. pen-needles, syringes, lancets, test strips) were given, whether insulin preparations (pen or vial) were specified in the prescription, and whether glucagon emergency kit was prescribed.

**Results:** Seventy-one residents (PGY-1 35%, PGY-2 30%, PGY-3 35%) completed the survey. 48% of PGY-1 reported feeling uncomfortable prescribing insulin and insulin-related supplies. This number decreased as the training level advances (PGY-2 19%, PGY-3 4%). Most residents (73%) reported that they prescribed insulin pen at discharge, but 32% were unaware that pen-needles and glucose testing supplies needed to be co-prescribed. Only 1% of residents reported that they consistently prescribe glucagon emergency kit while 83% were either unaware or never prescribed it. The main barriers in prescribing insulin were “multiple testing supplies to prescribe”, followed by “items not available in electronic medical record (EMR) discharge interface”, and “no formal training in prescribing insulin”.

**Conclusion:** Despite a large proportion of PGY-1 reported feeling uncomfortable prescribing insulin, residents' comfort level increases as their training level advances as 96% of PGY-3 reported feeling comfortable. We also identified that a large number of residents (32%) were unaware to co-prescribe pen-needles and glucose testing supplies when discharging patient on insulin pen which may lead to undesirable post-hospitalization outcome. Also, despite being potentially life-saving for some patients, 83% of residents were either unaware or never prescribed glucagon emergency kit. These findings, along with several barriers mentioned above may be modifiable and should be subject to future quality improvement project which include providing formal training in prescribing insulin and improving EMR discharge interface. In conclusion, avoiding insulin prescribing errors is essential to improve patient safety during transition-of-care from the hospital to outpatient settings. Focusing training and supervision towards PGY-1 while addressing modifiable barriers may reduce errors and cover current gaps in insulin prescribing skills of IM residents.

## ABSTRACT 40

### The Benefit of a Remote Learning and Quality Assurance Program on Limited Bedside Ultrasound Skills of Medical Students in Beira, Mozambique

**Authors:** James Mangan MD, David Terca MD, Gabriel Rose DO, Sebastian Siadecki MD, Turandot Saul MD

**Purpose:** Rigorous educational requirements and quality assurance (QA) measures have been established by the national organizations of emergency medicine in the United States to outline a uniform approach to point of care (POC) ultrasound (US) education. Many resource poor settings lack these standards, often because internal POC US educators do not exist. Most POC US courses provided by visiting doctors are short term, sporadic and do not include an ongoing, long-term component to build on and develop newly learned material. Our project explores the decay of POC US knowledge and skills with time after an introductory course and tests the benefits of a long-term educational curriculum and QA program on POC US skill retention. Our objectives were to 1) Evaluate how a lack of continuing education impacts POC US skill retention 2) Measure the impact of continuing remote education and periodic QA oversight on the retention and progress of POC US skills 3) Evaluate the feasibility of remote learning modalities and a QA program in an international setting.

**Methods:** After a three-day introductory POC US course that took place in March, 2015 in Mozambique, 20 fifth year medical students were not given any further structured education for a six month period to assess for decay in knowledge and skills. At that point, a remote curriculum was initiated including the viewing of recorded lectures, and the completion of worksheets and quizzes. Cardiac, thoracic and the FAST examination were the applications studied. Remote QA is being performed via digital transfer of images and clips and regular video conference. An objective standardized clinical exam (OSCE) was used for assessment after the introductory course, at the 6 month assessment and will be performed at the 12 month assessment in March, 2016. Student's scores at each point in the research protocol will be compared.

**Results:** OSCE testing was completed after the introductory course and after 6 months of the "no intervention" period. The students are currently completing the 6 month educational curriculum and quality assurance period of the research study. We are returning in March, 2016 to do the 12 month follow up OSCEs. We are currently in the process of data analysis.

**Conclusion:** POC US education in the US is robust, longitudinal and standardized. POC US education in resource poor countries may be due to a lack of internal exports to provide guidance and mentorship. Our project may prove that this continuous education and QA is necessary for POC US training and that it is possible for it to be provided remotely. We hope reporting our experiences may serve as a model for others with interest in extending POC US into the global community.

## ABSTRACT 41

### Improving the Organization, Efficiency, and Safety of Neurology Resident Handoffs

**Authors:** Laura Stein MD, Jonathan Gursky MD, Kyle Rossi MD

**Purpose:** In 2003 the ACGME issued mandates to limit resident work hours, and many resident training programs instituted a night float system. Because of the work hour restrictions, at many institutions resident handoff occurs daily on three separate occasions (AM, PM, and night). Ineffective handoffs have the potential to compromise patient safety. The purpose of this pilot study was to develop and assess a standardized electronic handoff to improve organization, efficiency, and safety of Neurology resident handoffs

**Methods:** At the end of the 2015 academic year, junior neurology residents were surveyed regarding the most important content for handoff materials they carry on call. They were asked for impressions of the current handoff process. Based on the results, smart phrases were created for the handoff section of the electronic medical record (Epic). In September 2015, after two months of call, new junior residents were surveyed on utilization of this standardized handoff and their impressions of the organization, efficiency, and safety of the handoff process.

**Results:** Of the 8 junior residents surveyed, 7 (87.5%) were using the standardized handoff all or most of the time and 6 (75%) knew how to generate the Epic handoff smart phrases. Four (50%) felt that the standardized handoff improved patient safety and handoff efficiency very much, and 4 (50%) felt that the standardized handoff did so somewhat. Five (62.5%) felt that the standardized smart phrases made the handoff process much better organized, and 3 (37.5%) felt that it did so somewhat. No residents evaluated the standardized handoff negatively. Additionally, 5 (62.5%) felt that handoff was somewhat well organized, compared to only 2 juniors (33.3 %) the previous year, prior to the initiation of the standardized handoff.

**Conclusion:** In this pilot study, a standardized handoff based upon resident input was highly utilized and perceived by residents to promote safety, organization, and efficiency.

# **PROFESSIONAL DEVELOPMENT**

**ABSTRACTS 42 – 48**

## ABSTRACT 42

### Teaching Medical Students to Cook: A Much Needed Skill

**Authors:** Sumedha Chablani BA, Robert Faller PhD, Karen Zier PhD

**Purpose:** Good health depends upon proper nutrition. Diets composed of vegetables, fruits, grains, low-fat dairy products, and lean sources of protein offer the greatest health benefits. Additionally, cooking food at home, compared to eating out or ordering in, is associated with an overall higher quality diet. We determined the eating behaviors of medical students, challenged to cook at home given the demands of their studies, and tested the hypothesis that time and poor cooking skills limit cooking.

**Methods:** The study population was first year medical students at Icahn School of Medicine at Mount Sinai in the classes of 2016 and 2017 (N = 280). We developed and administered an online, 38-item survey via Survey Monkey. The survey included questions regarding food preferences, cooking frequency, and interest in and perceived barriers to cooking. Attitudinal and behavioral questions were measured using a five-point scale ranging from strongly agree to strongly disagree. Statistical analysis was conducted using SAS. The study was deemed exempt by the Institutional Review Board.

**Results:** Ninety-seven percent strongly agreed or agreed it was important to eat nutritious food and 91% strongly agreed or agreed it was important to eat delicious food. Moreover, 88% were willing to invest effort to achieve these goals. To determine whether students' food preferences were consistent with a healthy diet, we asked which foods they liked to eat or would like to eat more of. The most popular foods included fruits (98%), vegetables (92%), and grains (87%). The majority of students were interested in eating even more vegetables (88%), fish (60%), and fruits (58%). Among those who do not frequently cook at home (n=56), 59% strongly agreed or agreed they would cook more if they were better cooks. Among those who do not consider themselves good cooks (n=53), 85% were willing to put in effort to eat nutritious, delicious food and 91% strongly agreed or agreed they would like to learn to cook better. The greatest deterrent to cooking at home was lack of time (82%) followed by skill (13%), cost (9%), and space (2%). Among those who strongly agreed or agreed that they enjoy cooking (n=71), the majority considered themselves outstanding, excellent, or good cooks. All of those who disagreed or strongly disagreed with this statement considered themselves poor cooks (P < .001). Students felt the most important factors influencing their interest in cooking were that the dish be quick (99%) and easy to prepare (96%).

**Conclusion:** Developing skills in cooking may encourage medical students to cook more at home. This could enhance their ability to counsel patients on consuming nutritious, home-cooked food, thereby helping themselves and their patients to eat a healthier diet.

## ABSTRACT 43

### A Structured Approach to Communication and Interpersonal Skills Remediation

**Authors:** Beverly Forsyth MD, Terry Sommer BFA, Rainier Soriano MD

**Purpose:** Effective physician communication and interpersonal skills (CIS) are essential to facilitating information-gathering, establishing patient partnerships, and promoting adherence; they are strongly linked to improved patient outcomes. The NBME recognizes the imperative for robust communication skills, and the USMLE Step 2 Clinical Skills (CS) exam has increased emphasis on CIS annually. To assess competence in clinical skills, most medical schools administer a summative assessment with a CIS domain. Typically, students who perform poorly on the exam are remediated. Yet, faculty report that CIS skills are amongst the most challenging to remediate and a gap remains in the availability of a structured experiential protocol for CIS remediation. Our program seeks to address this gap and provide remediation faculty with a concrete guide to CIS remediation.

**Methods:** At the end of their third year, our students participate in an OSCE emulating the Step 2 CS exam. Poor scorers are remediated. A physician and the director of the clinical skills center devised a uniquely structured Standardized Patient (SP) role-play to aid low CIS scorers. The facilitated approach is individualized and reproducible. We followed a 4-step process: 1) Review checklist/OSCE video 2) Identify learning goals with student 3) Facilitate role-play with student and SP 4) Debrief with student. Role-plays are chosen to address individual student needs and led by a trained faculty/facilitator. The time-in/time-out (TITO) technique is used. During TITOs, facilitator or learner may call “time-out” when guidance is needed; “time-in” resumes the encounter. The SPs are trained to give sensitive feedback “in character” during the TITO and only the SPs give feedback. The SP feedback provides students insight into patient emotions. It offers them multiple opportunities to adjust their behavior in the moment, and to forge a successful relationship with the SP. Students participating in CIS remediation complete two summative SP encounters following their TITO role-play. Remediation faculty review all encounter videos.

**Results:** 2015 qualitative data indicate improvement in the demonstrated CIS skills of students who participated in the structured remediation protocol, particularly in the areas of empathy and information-gathering. Of 65 students who participated in this CIS remediation protocol over the past 5 years, there were no CIS failures on the Step 2 CS exam.

**Conclusion:** Our experiential model is aligned with the established goals and objectives of CIS remediation and provides a practical way to implement them. Our structured process freed our facilitators to coach the encounter, and permitted skillful SPs to deliver difficult feedback. Within this framework, previously resistant students engaged with the SPs and changed behaviors. Future research goals are to apply this method to many levels of learner. In addition, we plan to survey the remediation faculty and students in order to evaluate and adapt the program.



## ABSTRACT 44

### Assessing the Impact of a One-Day Fracture Model Simulation to Increase Clinical Musculoskeletal Knowledge and Interest in Orthopaedics amongst Underrepresented Minorities and Women

**Authors:** Eliana Saltzman BA, Christian Pean MS, Hamadi Murphy MS, Sandra Fong BA, Michael Hausman MD, Toni McLaurin MD, Kenneth Egol MD, Bonnie Mason MD

**Purpose:** Orthopedic surgery remains one of the least racially and gender diversified surgical subspecialties. The lower rate of orthopedics applications amongst underrepresented minorities (URM) and women has been linked to a lack of exposure to musculoskeletal (MSK) topics in medical school. The purpose of this study was to assess the impact of a one-day fracture model simulation (FMS) on documented deficits in medical student MSK knowledge, and to increase interest in orthopedics.

**Methods:** 35 students attended an eight-hour workshop, which included didactic sessions, a mentoring panel, and four fracture simulation surgical skills stations. Demographics were recorded for all participants. A 40 item pre- and post-workshop questionnaire assessing student MSK confidence using a 5-point Likert scale was distributed. A 10- question subset of the previously validated Freedman and Bernstein MSK knowledge assessment was included as well. Paired student t-tests were used to assess continuous variables. Pearson's Chi-square and odds ratios were used for categorical variables.

**Results:** Twenty-one students completed the pre and post-workshop questionnaires for paired analysis. 43.4% were URM students and 65.2% were first year medical students. Significant increases in MSK physical exam confidence ( $1.67 \pm 0.97$  vs  $2.81 \pm 0.93$ ,  $p$ -value $<.001$ ), and percent correct questions on MSK clinical knowledge (24% vs 54%,  $p$ -value $<.001$ ) were observed. 100% of participants responded that they would attend a similar workshop in the future and 94% agreed that the workshop increased their interest in orthopedics.

**Conclusion:** Initial results suggest that the FMS workshop is a successful platform for increasing medical student MSK knowledge and interest in orthopedics. Results should be cautiously interpreted, with consideration of the self-selection bias inherent to the program's setup. This workshop may represent a viable method for increasing interest in orthopedics for URM. Further analysis is needed to discern the longitudinal impact of this program on participants' knowledge retention and specialty choices.

## ABSTRACT 45

### Development of an Online Narrative Medicine Journal for Ophthalmology and Optometry: The Journal of Narrative Visions

**Authors:** Kalla Gervasio BA, Kellie Gergoudis BA, Albert Wu MD, PhD

**Purpose:** Narrative medicine is a field that has risen in popularity over recent years, with the majority of journals and initiatives focusing on general medicine and specific fields like oncology. Few studies have explored the use of narrative medicine in the fields of ophthalmology and optometry. Visual loss is a devastating experience for patients, and one that can uniquely be communicated through writing and other creative venues. The purpose of this study was to develop an online literary ophthalmology journal, The Journal of Narrative Visions: JNV, and to assess the themes and characteristics of narrative medicine pieces submitted to this initiative. This project was made possible with a grant from the Arnold P. Gold Foundation.

**Methods:** Between January 1, 2015 and September 30th, 2015, healthcare workers including but not limited to physicians, residents/fellows, medical and pre-medical students, as well as patients and caregivers, were invited to contribute submissions to JNV through online advertisement. During this time, 12 submissions were received. Ten submissions were considered to fall into the categories of reflective essay, poetry, or artwork and were included for qualitative analysis. Each piece was analyzed for trends in theme, contributor characteristics, and differences in language used to describe visual loss.

**Results:** Contributors were predominantly male (70%) and either pre-medical, medical, or optometry students (60%). Ophthalmologists, optometrists, and vision scientists comprised 40% of contributors. The majority of pieces were reflective essays (60%), followed by poetry (20%), and artwork (30%) including paintings, drawings, and photography. The most popular topics in pieces of all categories were low vision/blindness (70%), followed by global health (30%), optics/vision science (30%), retina (30%), cataracts (30%), and ophthalmology or optometry education (30%). Other topics included ocular anatomy, cornea, pediatric ophthalmology, and refractive error. Amongst all submitted pieces, authors most commonly used the terms “blind”/“blindness” (average of 1.9 times per piece) or “vision” (1.5 times per piece) rather than “sight” (0.7 times per piece) or “perception” (0.5 times per piece) either in the body of the text or title of their work.

**Conclusion:** Results show that the application of narrative medicine in ophthalmology and optometry is most popular among students across multiple fields and levels rather than healthcare workers who have already completed their training. Creative work regarding ophthalmology or optometry most often revolves around the topic of low vision or blindness. Further data collection is being developed to survey contributors on whether or not the act of reflection on vision care serves to improve their communication skills and empathy toward patients.

## ABSTRACT 46

### Improving Clinical Feedback: A Dual Intervention among Residents and Attendings

**Author:** Felicia Hercules MD

**Purpose:** The importance of clinical feedback in medical education has been stressed for many years in the medical education literature. While this is a known fact, current literature still struggles to find ways to effectively fill this void. The purpose of this study is to implement a reproducible intervention that will improve feedback delivery and reception among attendings and residents in the emergency room setting.

**Methods:** The study population includes Emergency Medicine residents and attendings at Mt Sinai St. Luke's Hospital and Mt Sinai West Hospital in New York, NY. Initial needs assessment surveys will be conducted in order to demonstrate the need for increased feedback. Attendings and residents will receive an intervention in the form of a short lecture and laminated reference cards respectively. The attending intervention will focus on the delivery of quality feedback, while the resident interventions will focus on ways to seek out and accept feedback. After a defined intervention period, a post-intervention survey will be sent to both faculty and residents to assess whether they have changed their practice.

**Results:** The end-points of this study are the quantity of feedback given by attendings and improved feedback reception by residents. These measures will be assessed based on responses to a post-intervention survey.

**Conclusion:** Addressing the feedback void needs to be a collaborative effort by both residents and attendings alike. Similar to sports and music, as a weak task is practiced repetitively with the focus on improvement, it will become easier and more comfortable with time. Clinical feedback is no exception to this rule. As attendings increase the amount of feedback they give, they will become more comfortable with this cultural change. After an initial struggle, the task will become easier until it is ingrained and can be tapped into with minimal effort. The same applies to residents as they seek out feedback and open themselves to the reception of unbiased critique.

## ABSTRACT 47

### Comparative Investigation of Difference in Healthcare and Post-Graduate Education between the United States and Japan: A Qualitative Study

**Authors:** Hirotaka Kato MD, Burger Alfred MD, Robert Yanagisawa MD, Jenny Lin MD

**Purpose:** Medical education is often overlooked but an important factor to train future physicians with capabilities to meet increasing social needs. In an effort to elucidate problems in need of improvement in Japan's medical education, we sought to identify the differences in healthcare and post-graduate training from the perspective of Japanese international medical graduates, who train or have trained in both Japan and selected residency programs in New York City.

**Methods:** A cross-sectional online survey was conducted from July 2015 to September 2015. The questionnaire consisted of both open- and closed- ended questions related to differences between the US and Japan regarding post-graduate training, health insurance, approach to preventive care, and primary care clinic system. Grounded theory was used to analyze narrative scripts and identify themes.

**Results:** 118/152 (77.6%) completed the survey. Respondents consisted of 20 current residents (17%), 95 graduates (81%) and three no answers (2%). Of the graduates, 26% graduated within 5 years, 30% between 6 – 10 years ago, 24% >10 years ago. The most common specialties included internal medicine (67%) and pediatrics (18%). Themes regarding post-graduate training revealed that US training was more standardized, evidence based, and comprehensive, whereas Japan's training had more procedural exposures. Regarding health insurance, the respondents felt that the US insurance caused limited access and inequity due to medical decisions dictated by insurance, complexity of the system and unequal coverage. In contrast, the Japan's universal insurance enabled open access and affordable cost, but there was a concern about sustainability due to an aging society and abuse of the system. Prohibition of mixed billing was considered as a drawback, delaying access to state-of-the-art treatments. Themes regarding approach to preventive care revealed that the US was primary care- based, which was more tailored, evidence based/standardized with continuity but could miss more people without PCP, whereas Japan employed mass screening, which efficiently screened more people but was not tailored. Some respondents felt that immunizations and health maintenance were widely accepted in the US, whereas efforts towards preventive care were limited in Japan. Regarding primary care systems, the US was more physician-friendly with manageable patient flow and longer time for each encounter, but the access was limited, whereas Japan was more patient-friendly because of open access creating disorganized patient flow, short time for visits, and long waiting time. Some respondents mentioned that the clinic in Japan was incentivized to see more patients due to payment cut and it functioned in part as urgent care.

**Conclusion:** The study findings suggest several implications for medical education in Japan: (1) standardization of post-graduate training, (2) training in preventive medicine including immunization, (3) emphasis on outcome evaluation of preventive care, and (4) preparing trainees to provide primary care effectively in a limited encounter time.

## ABSTRACT 48

### The Impact of U.S. Clinical Training on International Medical Graduate's Career from Japan: A Qualitative Study

**Authors:** Hirotaka Kato MD, Burger Alfred MD, Yanagisawa Robert MD, Jenny Lin MD

**Purpose:** There is little data about longitudinal impact of U.S. clinical training on IMG's career. In order to shed light on academic contribution of IMGs, we sought to identify reasons pursuing U.S. clinical training from a high-income country, and its career impact among IMGs from Japan.

**Methods:** We used the Japanese IMGs' network, known as "N program scholars," consisting of current residents and graduates from selected New York City residency programs. A cross-sectional online survey was conducted from July 2015 to September 2015. The questionnaire included characteristics, current positions, reasons of US clinical training and its impacts on their careers. Grounded theory was used to analyze narrative scripts and identify themes.

**Results:** 118 out of 152 (77.6%) completed the survey. Respondents consisted of 20 current residents (17%), 95 graduates (81%) and 3 no answers (2%). Of the graduates, 26% graduated within the past 5 years, 30% between 6–10 years ago, 24% >10 years ago. At the start of their US residency, 45 (38%) were PGY 3 or less in Japan, 92 (78%) were PGY 6 or less. Twenty-nine (33%) have or are currently pursuing an advanced degree. The most common residencies included internal medicine (67%) and pediatrics (18%). The most common fellowships included infectious disease (13%), hematology/oncology (11%), cardiology (8%), and pulmonary/critical care (7%). One hundred respondents (85%) currently work in academic settings including university hospitals (52%) and tertiary medical centers (33%), either in the United States (67%) or in Japan (30%). Among the 64 attending physicians, 15 (23%) are currently either at the professor level or hold higher administrative titles (division chief, department chair, or president), 7 (11%) are associate professors, and 26 (40%) are assistant professors. Common themes regarding reasons for US training included standardized clinical/academic training, pursuing fellowship not available in Japan, broader career options, and diverse experience. In addition, inspiring professional networking was identified as advantages of US training in their careers, whereas estrangement from Japan including reverse culture shock, additional overlapping residency, financial burden, and limited procedural training were often seen as the drawback. As for career impact of US training, many respondents reported that their US residency was the game changer for their careers, and they were recognized as a leader and/or a pioneer in Japan. US residency also gave them the foundation for clinical/academic skills, broad perspectives and inspiring professional networks.

**Conclusion:** Many Japanese IMGs sought US residency for subspecialty training not available in Japan, and they have been academically successful in both the US and Japan over the long term. They report that training in the US gave them a wealth of experience, skills, broader views and expanded professional networks. N program graduates demonstrate significant academic commitment and contributions, both in the US and Japan.

# **SIMULATION I**

## **ABSTRACTS 49 – 54**

## ABSTRACT 49

### Is there a Pediatric Resident on Board? The Use of Simulation to Educate Pediatric Residents about In-Flight Medical Emergencies

**Authors:** Scott Moedler MD, Cecilia Thompson MD, Sheemon Zackai MD

**Purpose:** In-flight medical emergencies are a common occurrence. To our knowledge, there is currently no literature regarding education of pediatric residents on handling and assisting with pediatric in-flight emergencies. The purpose of this study was to expose residents to pediatric airplane medicine, develop a simulation intervention to meet the skill and knowledge deficit, and to evaluate its impact on resident self-perceived comfort.

**Methods:** The one hour session was done during a noontime academic conference. Prior to the start, a pretest survey was administered to all participating residents regarding their knowledge and comfort with airplane medicine. The session consisted of case based simulation scenarios including anaphylaxis and asthma exacerbation with development of a pneumothorax. Topics discussed included the concept of assisting in a medical emergency in-flight, the unique airplane physiology in-flight and its effects, and anticipatory guidance for different patient populations. At completion, a posttest survey was given to all who were present to reassess their comfort and knowledge.

**Results:** 21 residents completed the pretest and 25 residents completed the post test. At pretest, 0% of residents reported being extremely or very comfortable responding to inflight emergencies, while at posttest 40% (n=10) stated that they were. As seen in the Figure, there was a statistically significant increase in the mean comfort in responding to an in-flight emergency. In addition, there was a statistically significant improvement in resident comfort with providing families anticipatory guidance on air travel. Compared to prior to the intervention, residents' self-reported knowledge of available resources and relevant physiology of aviation medicine increased significantly (Figure). At post-test, 100% of residents reported that they 'strongly agree' or 'agree' that their comfort with pediatric in-flight emergencies and understanding of available resources increased.

**Conclusion:** Our study demonstrates that the use of simulation, a well-accepted education tool, improves pediatric resident comfort and knowledge in regards to pediatric in-flight emergencies. The results of the pretest survey indicate how currently unprepared residents are for problems in flight, when they may be called upon to assist or lead. With the prevalence of air travel, the importance of pediatricians being prepared and comfortable with assessing events during flights and preparing patients for possible problems cannot be underscored. This intervention was completed during a resident academic conference and highlights the feasibility of training residents on a short interactive session. Future work would include follow-up assessment and evaluation using standardized simulation check lists would be beneficial to assist in the analysis of the intervention.

## ABSTRACT 50

### Technology-Driven, Clinically-Focused Curriculum Reform: An Ultrasound Case Study

**Authors:** Naman Barman BA, Anirudh Kumar BA, Andrew McCullough MD, Martin Goldman MD

**Purpose:** The reality of the vast majority of curricula seen at US medical schools is that meaningful clinical exposure does not begin until the third year of one's education. Therefore, through our innovation, we seek to ameliorate the twin problems of: (a) lack of clinical integration into the medical curriculum and (b) poor understanding of abstract physiological and pathophysiological concepts that form the basis of clinical practice. In partnership with the Division of Cardiology at the Icahn School of Medicine at Mount Sinai, we developed an IRB-exempt pilot study that featured an echocardiography curriculum that would be appropriate for second-year medical students who would be concurrently studying relevant cardiac pathophysiology modules.

**Methods:** We modeled our instructional approach after the “A-F” paradigm<sup>2</sup>, emphasizing ultrasound technique, major structures and expected appearance, as well as major pathology and how & where to look for it. The curriculum was comprised of four modules that included basic ultrasound technique, identifying pathophysiological processes, dedicated time at the Mount Sinai Echocardiography Simulation Lab, and didactics integrated throughout the course of the sessions. We enrolled twenty second-year medical students into this pilot program via email outreach. We generated evaluation metrics through the use of a focused echocardiography OSCE completed before and after training. Additionally, surveys on the quality of training and the role of clinical ultrasound in medical education were conducted.

**Results:** Nineteen of the original twenty that enrolled into the program completed the sessions in full including the evaluation metrics outlined. Average age of the participants was 24.7 with the youngest participant aged 22 years and the oldest being 28. Of note, five of the students had already used an echocardiography machine on one or more occasion. Nevertheless, the Focused Echocardiography OSCE results showed marked improvement in echocardiography skills from baseline. A paired T-test showed an average of 45.2 percentage point improvement (Figure 1) in scores (95% CI [29.3, 61.2]) and the results were significantly different ( $p < 0.0001$ ). The medical education survey also yielded stunning insights regarding the impact the course had on the students: 89.5% of the students agreed or strongly agreed that the course enabled them to get more out of the cardiac pathophysiology curriculum and agreed or strongly agreed with the statement that “this course will make you a better and/or more competent physician.”

**Conclusion:** The students, both by objective measures and their own estimation, had clearly gained a skill and felt confident in their ability to use the skill of echocardiography. The overwhelming majority of students saw this course as enriching to their curriculum and study of cardiology and perhaps most compellingly, a course that would make them better doctors.



## ABSTRACT 51

### Sonographic Education: A Study on the best way to Simulate Deep Vein Thromboses

**Authors:** Patrick Olivieri MD, Michael Doctor MD, Aaran Drake MD, Melvin Ku MD, Gabriel Rose DO, Sebastian Siadecki MD, Turan Saul MD

**Purpose:** Multiple studies have concluded that simulation-based teaching enhances confidence and the ability of learners to complete various ultrasound guided protocols and diagnostic scans. To our knowledge, there have been no studies examining the ability of novice sonographers to learn how to perform a four part ultrasound examination to diagnose or rule out deep venous thrombosis (DVT) with simulation models. While models exist which mimic human anatomy for this purpose, they are expensive and cost several thousand dollars, which limits their use. We wish to create our own simulation mannequin based on human lower extremity vascular anatomy using low-cost materials, which would enable its widespread use and long-term use.

**Methods:** Two separate models were compared. Penrose drains were filled with a piece of a glue stick to simulate a thrombus. The drains were then filled with water and sealed to remove any air bubbles. These drains were suspended in containers. Knox gelatin was mixed to 10% concentration by adding half the amount of water in a cold form, then adding the appropriate amount of gelatin, then boiling the remainder of the water and mixing until it dissolved. The ballistic gelatin was bought and involved adding warm water (140 Fahrenheit) to a bag of ballistic gelatin, then adding a de-foamer, then adding more water of the same temperature and mixed. Each was poured into the respective model to fill the container to 2-3cm above the model vessel. Both solutions were refrigerated and brought into weekly conference. Residents were consented and pulled out one at a time to use our ultrasound and compare the two compositions by answering a brief survey.

**Results:** 20 emergency medicine residents participated in the study. 18/20 felt the ballistic gelatin allowed more clear visualization of the vessel ( $P < 0.05$ ). 15/20 for the Knox gelatin has a firmness more similar to human tissue ( $P < 0.05$ ) and 16/20 felt that the Knox gelatin had less distracting particles (0.05). Ballistic gelatin was favored over Knox gelatin in sonographic appearance (13/20, p-value 0.114), overall preference (13/20, p-value 0.114) and the group was even (10/20, p-value 0.752) for which product returned to baseline after compression.

**Conclusion:** This study gives support to the notion that ballistic gelatin is at least as good, if not better, than Knox gelatin for training emergency medicine house staff to diagnose DVTs via ultrasound. While the results were mixed and favored Knox gelatin in firmness and distracting particles, the ballistic gelatin was clearer to work with and there was a slight preference towards ballistic gelatin though not statistically significant. Given its ease to create, and better durability long-term and in room temperature, this group would recommend ballistic gelatin for DVT models going forward.

## ABSTRACT 52

### Sonographer Preference of Ballistic Gelatin Concentrations for Use in a Simulated Deep Venous Thrombosis Training Model

**Authors:** Michael Doctor MD, Patrick Olivieri MD, Aaran Drake MD, Sebastian D Siadecki MD, Gabriel Rose DO, Melvin Ku MD, Turandot Saul MD

**Purpose:** Hundreds of thousands of patients are diagnosed with deep venous thromboses (DVT) every year which causes pain, swelling, and can lead to a fatal pulmonary embolism. The literature has shown emergency physicians can perform a diagnostic ultrasound with high sensitivity and specificity, but many have not been trained to do so. Simulation models are available with the necessary anatomy of compressible blood vessels for training; however these models are very expensive. For many other applications of ultrasound, models of various mixture combinations have been used for different simulators. These generally use Knox gelatin which is cheap and readily available at most grocery stores, but has a very short shelf life and is too delicate for use in a DVT model as compressibility of simulated blood vessels with an ultrasound probe will puncture and ruin the model. A method for making a venipuncture model using ballistic gel has previously been described, but its ideal concentration has not yet been investigated. To identify the concentration of ballistic gel that best simulates diagnostic DVT sonography, we compare 5%, 10%, and 20% mixtures of ballistic gelatin with regard to emergency physician preferences.

**Methods:** This was a single-blinded prospective study of 25 Emergency physicians composed of residents and attendings. A model was created using 250 bloom ballistic gelatin (Custom Collagen, Addison, IL) as per the manufacturer's instructions to create 20 cups of a 10% solution. The volume of gelatin was then doubled and halved to create the 20% and 5% solutions respectively. 0.375in Penrose drains (Convivial, Minneapolis, MN) were placed in our molds approximately 1cm deep to the surface after being filled with water and a 10cm glue gun stick. These sticks were to prevent compressibility and simulate a DVT, but were sonographically translucent. Residents were individually asked to use a Sonosite M-turbo ultrasound system (Bothell, WA) with a L25 (13-6 MHz) linear probe compressing various parts of the vein using similar pressure as they would with a human. They rated the three gelatin materials in terms of clearest visualization, similarity to human firmness, similar sonographic appearance to human tissue, number of distracting particles, return to original shape after compression, and overall sonographer preference.

**Results:** The 10% ballistic gelatin mixture was clearly preferred in all categories except for the number of distracting particles. Subjects reported the 20% mixture had the least number of distracting particles compared with the 10% and 5% mixtures (10-8-6 respectively).

**Conclusion:** When using ballistic gelatin mixtures for simulation DVT models, emergency physicians prefer a 10% solution instead of 20% or 5% solutions. Although a 20% solution was thought to be more durable, it seemed to be too hard and not as compressible or realistic.

## ABSTRACT 53

### Simtubate: A Simulation-based Airway Curriculum

**Authors:** Jessica Leifer MD, Christopher Strother MD

**Purpose:** Like many emergency medicine (EM) training programs, residents at Mount Sinai Hospital begin managing patients' airways and performing intubations as PGY2s. During internship, our residents spend two weeks on an anesthesia rotation learning to intubate. Residents also supplement their education with reading. Airway management education among residents can be highly variable depending on individual experiences on the anesthesia rotation, number of intubations performed, and how much self-teaching a resident does. Adding a simulation based airway course will enhance procedural skills, allow deliberate practice, and ultimately lead to improved patient safety in the ED. Our objective is to assess the need for, then create and implement a simulation-based airway module for the EM PGY1s.

**Methods:** A needs assessment was begun by surveying senior residents and the residency director regarding content to include. Next, we conducted an assessment of current PGY2s' airway skills in the simulation center. The PGY2s performed a routine intubation on a simulated patient and are being scored using an established checklist by two raters. We will then design an airway course for the PGY1s based on those results as well as topics the senior residents and residency leadership feel are important. Topics to be covered include preparation, rapid sequence intubation, procedural details, management of a difficult airway, and post-intubation care. The course will be taught during the spring before residents are expected to manage airways in the ED. We plan to conduct a post-course evaluation in the simulation center by giving the PGY1s the same assessment that the PGY2s completed prior. We will also interview the participants to determine impact and areas of improvement for the course.

**Results:** Senior residents felt their internship was lacking in formal instruction on intubation and the opportunity to practice in a safe environment, as well as technical skills related to difficult airway management. Residency leadership felt that managing a difficult or failed airway was a deficiency and asked us to work that into our curriculum. At this time we are in the process of reviewing and scoring the intubations performed by the PGY2s. 12 PGY2s participated in the initial simulation. We plan to teach the airway module in April and conduct the post-module assessment of the PGY1s in June. Thus far, the PGY2s who have completed the initial assessment expressed positive feedback about the course and state they would have liked formal airway training when they were PGY1s.

**Conclusion:** In the future, we plan to offer the course to all residents. One future direction may be to implement an examination that PGY1s will need to pass before they are allowed to intubate in the ED. We hope that this curriculum will lead to improved patient outcomes and decreased complications due to emergency airway management.

## ABSTRACT 54

### The Room Where it Happens: A Low Fidelity in Situ, Interdisciplinary Simulation Course to Improve Trauma Team Performance

**Authors:** Shannon McNamara MD, Elyse Lavine MD, Deborah Travis RN

**Purpose:** Trauma resuscitation is a challenging clinical scenario in which physicians, nurses, and allied health professionals from both the departments of Emergency Medicine and Trauma Surgery must collaborate to provide safe and effective care to critically ill patients. In Situ Simulation in the clinical setting has been shown to be an effective strategy for improving team performance and detecting latent safety threats in an Emergency Department setting (Steinemann 2011).

**Methods:** From November 2015 to February 2016, eight training sessions were planned from 7:30am-8am in the Emergency Department resuscitation area. One session was canceled due to high patient acuity. Learners were Emergency Medicine residents, Trauma Surgery residents, Emergency nurses, and Emergency technicians that were working clinically during that time. This reflected the normal team composition during trauma resuscitation. The simulation scenario involved a pedestrian struck by a motor vehicle that presented with hypotension and altered mental status. A low-fidelity resuscitation manikin was used as the patient model. The “Simulation Monitor App” with an iPhone and iPad were used to display vital signs and project the patient’s voice. Each scenario lasted 5-10 minutes with 15-20 minutes for debriefing. Debriefing emphasized PPE compliance, role clarity, and team communication. Team members identified latent safety threats and discussed perceived barriers to efficient care that were documented and shared with EM and Trauma Surgery leadership. After each session, anonymous learner feedback was collected and identified latent safety threats were documented.

**Results:** Data collection and analysis is ongoing. To date, 51 participants have completed 6 training sessions.

**Conclusion:** Our hypothesis is that this low fidelity simulation scenario is an effective and easy to implement training tool for interdisciplinary trauma teams at a Level One Trauma Center. The in situ model is helpful strategy to identify latent safety threats in order to improve patient care. Next steps include integration of simulation training into existing nursing trauma training courses at our institution, continued in situ sessions, and after action review of clinical events.

1. Steinemann S, Berg B, Skinner A, et al. In Situ, Multidisciplinary, Simulation-Based Teamwork Training Improves Early Trauma Care. *JSURG*. 2011;68(6):472-477. doi:10.1016/j.jsurg.2011.05.009.

# **SIMULATION II**

## **ABSTRACTS 55 – 59**

## ABSTRACT 55

### Simulated Death Enhances Learner Attitudes Regarding Simulation

**Authors:** Chang Park MD, Douglas Wetmore MD, Adam Levine MD, Samuel DeMaria MD, Andrew Goldberg MD

**Purpose:** Despite the widespread use of simulated death in healthcare simulation, it can be viewed as a controversial learning tool given its potential psychological harm to the learner. There is little hard evidence that simulated death negatively affects practitioners but it is still a critique held by some. While there are some theoretical concerns regarding simulated mortality, we believe that allowing death during simulation maintains fidelity and enhances participant learning and performance without negatively affecting the learner. Currently there is sparse data in the literature about learner attitudes towards simulated death. Our objective is to establish a link between learner attitudes regarding simulation and exposure to simulated death. Our hypothesis is that exposure to simulated death will actually positively affect learner attitudes toward simulation.

**Methods:** Anonymous surveys were distributed to all participants of full environment simulations at the Human Emulation, Education, and Evaluation Lab for Patient Safety and Professional Study Simulation (HELPS) Center in the Department of Anesthesiology at Mt. Sinai Medical Center from 01/2014 – 12/2015. Participants included medical students, anesthesiology residents, and attending anesthesiologists from multiple institutions. Demographic data was collected for the learners' clinical level and number of years in practice. Simulation data was collected for number of scenarios, exposure to death, number of deaths experienced, if the simulation was helpful, if the simulation will change practice, and whether simulated death can enhance learning. Participants also rated the simulations on a Likert scale (1-5). Using the chi-square test, we compared demographic and simulation data for the group that experienced simulated death and the group that did not. Exposure to death and clinical level were included as predictor variables in logistic regressions using the simulator experience variables as outcomes.

**Results:** 250 survey responses were included in our analysis. 64% of participants were attendings. 82% experienced death during simulation. Those who experienced death in simulation gave significantly higher ratings (4.77 vs. 4.5,  $p=0.004$ ) and more maximum ratings on the Likert scale (83% vs. 59%,  $p=0.0002$ ). More participants who experienced death thought that simulated death can enhance learning (76% vs. 59%,  $p=0.021$ ). When adjusted for training level, those who experienced death in simulation were twice as likely to think that death can enhance learning ( $p=0.049$ ) and 133% more likely to give the simulation the highest rating ( $p=0.036$ ).

**Conclusion:** Survey participants who experienced simulated death were more likely to think that death can enhance learning and to give the simulation the highest rating, regardless of training level. Thus, our study demonstrates that exposure to simulated death positively affects learner attitudes regarding simulation.

## ABSTRACT 56

### Affect Self-Regulation Predicts Graded Performance in Real-Time Crisis Simulation

**Authors:** Stefan Samuelson MD, Andrew Goldberg MD, Philip Petrou AB, Anthony DeMaria PhD, Alan Weinberg MS, Samuel DeMaria Jr. MD

**Purpose:** In the field of simulation-based education and assessment, controversy persists regarding the role of emotional stress in augmenting or diminishing the benefit of simulation to participants. In the heightened emotional environment of the simulator, it is unclear why some participants seem to thrive, while others suffer. Using validated measures from the field of psychology it is possible to quantitatively assess a person's skill at affect management, which refers to the ability of an individual to regulate the intensity of his or her own emotional experience. This study investigates whether skill at affect regulation can be correlated with objectively assessed performance in a battery of high-stakes simulated exercises.

**Methods:** After IRB approval, PGY-2 anesthesia residents from our institution participated in a structured simulation-based series consisting of standardized simulated operating room crises designed to feature increasing clinical acuity and emotional intensity. Prior to participating in these scenarios all residents completed the Difficulties in Emotional Regulation Scale (DERS), in which a higher score indicates greater difficulty with emotional self-regulation. For the final four, most stressful scenarios, residents were assessed by blinded attending anesthesiologists using the Anesthesia Non-Technical Skills Scale (ANTS), in which a higher score indicates a superior performance using benchmarks such as task management, situation awareness, and decision-making. ANTS scores over all four scenarios were 1) combined and 2) averaged and linear regression was carried out to determine any effect of DERS score on objectively-assessed performance.

**Results:** Fifty anesthesia residents over two consecutive years were recruited to complete the simulated crisis series. All residents completed all scenarios. DERS score was strongly associated with ANTS cumulative score, with a higher DERS score correlating with poorer performance as measured by the ANTS ( $p < 0.0001$ ). This correlation persisted when ANTS score was taken as an average ( $p < 0.0001$ ).

**Conclusion:** Our study demonstrated that increasing difficulty with affect self-regulation as measured by a validated psychological scale correlated significantly with poorer graded performance in a series of stressful operating room simulations. Future studies may determine whether an "optimum stress level" can be defined in a manner specific to individual participants in order to maximize learning and optimize performance.

## ABSTRACT 57

### Outcome Predictability Influences Psychological Engagement and Performance in High-Stakes Simulation

**Authors:** Stefan Samuelson MD, Philip Petrou AB, Andrew Goldberg MD, Anthony DeMaria PhD, Alan Weinberg MS, Samuel DeMaria Jr. MD

**Purpose:** Recently in the field of anesthesiology, attention has been paid to learning theory and the influence of emotion on performance, especially as relating to simulation. It has been hypothesized that optimum learning and performance occurs within a discreet range of subjective emotional intensity, with very low and very high levels of emotion being less beneficial to learning and performance. In simulation, willingness of participants to 'believe in' simulated scenarios, and thus to psychologically 'engage', may be influenced by perceived ability to predict the outcome of the scenario. This study investigates whether deliberate unpredictability of outcome in simulated exercises could be correlated with objectively-scored performance.

**Methods:** After IRB approval, anesthesia residents from our institution participated in a standardized series of weekly simulated operating room scenarios. Prior to participation, each resident was randomly assigned to one of three cohorts regarding patient outcome: in cohort 1, the patient always died during the simulation; in cohort 2, the patient always lived; and in cohort 3, the patient died approximately 50% of the time in randomized, inconsistent order. Participants were not informed of their cohort assignment. After an acclimation period of eight weeks had passed, residents were scored on four subsequent scenarios using the Anesthesia Non-Technical Skills Scale (ANTS), in which a higher score indicates a superior performance. Multivariate analysis was carried out to determine the effect of group assignment on performance.

**Results:** 50 Anesthesiology residents were enrolled, of which 17 were assigned to the "patient never dies" cohort, 17 to the "patient always dies" cohort, and 16 to the "patient dies unpredictably" cohort. Inclusion in the "patient dies unpredictably" cohort was significantly associated with higher performance as measured by the ANTS ( $p=0.01$ ). Inclusion in the "patient always dies" and "patient never dies" cohorts showed no correlation with objective performance.

**Conclusion:** In this study, residents who experienced patient death unpredictably in the simulated scenarios performed better in non-technical skills assessments as measured by the ANTS. Residents who experienced patient death in a consistent manner (never or always) performed neither better nor worse. While further investigation may clarify these results, it may be that the element of unpredictability encouraged sustained psychological engagement in the simulated exercises and led to improved performance.



## ABSTRACT 58

### Prejudice or Perspective? Subjective Valuation of Simulation Correlates with Objective Performance

**Authors:** Stefan Samuelson MD, Andrew Goldberg MD, Philip Petrou AB, Anthony DeMaria PhD, Alan Weinberg MS, Samuel DeMaria Jr. MD

**Purpose:** As simulation has been incorporated increasingly into the field of anesthesiology, heated debate has arisen regarding its value as a tool for teaching and assessment. Strong opinions are evident both for and against simulation, but the basis of these opinions at times seems based in emotion more than on facts. Previous studies have demonstrated that measurable benefit from simulation is not uniform among all participants. This study seeks to determine if objectively scored performance on simulated exercises can be correlated with subjective assessment of the value of simulation.

**Methods:** After IRB approval, anesthesia residents from our institution participated in a structured simulation-based curriculum consisting of a series of twelve standardized simulated operating room scenarios. During the final four scenarios, individual resident performance was assessed by blinded attending anesthesiologists using the Anesthesia Non-Technical Skills Scale (ANTS), in which a higher score indicates a superior performance using benchmarks such as task management, situation awareness, and decision making. After completion of the simulated curriculum, participants were asked to complete a simple Likert scale regarding how helpful they felt the simulated curriculum had been, with 1 indicating “Not at all helpful” and 5 indicating “Extremely helpful”. Multivariate analysis was carried out to determine any correlation between ANTS scores (sum and average) and subjective assessment of simulation-associated benefit.

**Results:** Fifty anesthesia residents participated in the twelve-scenario simulation series. All residents completed all scenarios and were scored by 2 of 3 participating attending anesthesiologists. Subjective assessment of benefit from the simulated curriculum was significantly associated with higher ANTS scores taken cumulatively ( $p=0.05$ ) and as an average ( $p=0.05$ ).

**Conclusion:** In this study, residents who scored better via objective assessment were more likely to report that they had found the simulated exercises beneficial. Though this may initially seem self-explanatory, it is surprising considering that participants who performed better (and thus had less opportunity to “improve”) saw more value in the simulated curriculum they had just completed than those who had more room to grow. It may be that subjective assessment of the value of simulation is actually related to one’s own ability to benefit from it, and hence rooted in fact rather than emotion. Further studies should be carried out to determine if pre-existing bias regarding simulation can be similarly correlated with performance.

## ABSTRACT 59

### A Simulation Program for Emergency Medicine Faculty

**Authors:** Christopher Strother MD, Andreea Nemes MD, Michael Falk MD, Christine Preblich MD, Viral Patel MD, Thomas Nguyen MD, Shannon McNamara MD, Amish Aghera MD

**Purpose:** Practicing faculty get very little if any continued training in procedures. They are credentialed and supervise residents, but rarely get to do procedures themselves, much less get feedback on their performance in order to improve. We developed a simulation-based curriculum focused on high risk, low frequency procedures for the emergency medicine (EM) faculty at five hospitals. We will discuss joint development of the course, and the first completed module, video laryngoscopy (VL). We have also completed a tube thoracostomy module and are completing a sterile central line module, but they are not yet analyzed.

**Methods:** The curriculum was developed with feedback from simulation experts and departmental leadership at five hospitals (Mount Sinai Hospital, Mount Sinai West, Mount Sinai Beth Israel, Maimonides, and Montefiore). After initial discussion in the HIC ED Safety Committee, a needs assessment survey of ED leadership was done to decide the most important procedures to train first. We chose to start with procedures to introduce faculty to being simulation learners, with a long term goal to create team and communication sessions for faculty in the future. 250 EM faculty completed the VL module. In small groups, faculty watched a brief video, a live demonstration, discussion of tips for the procedure, and troubleshooting. Faculty were then given time to practice hands on with feedback for mastery. Faculty were assessed in a real time simulation. We measured performance using instruments we developed, through a modified Delphi method by EM and airway experts. It included a checklist, a psychomotor score, a Dreyfus novice to expert scale, and an adequate / inadequate rating. We then reassessed at 6 months.

**Results:** Average checklist score was 97% on initial assessment, and 94% at 6 months. Average psychomotor score as 84% initially, and 81% at 6 months. Evaluator scores were more favorable than faculty's self-ratings of their performance (low to moderate kappa). Years out of training did not affect initial scores, but was significant 6 months post course. Self-reported number of procedures done and number supervised in the past year did not correlate with performance. Pediatric sub specialists performed somewhat worse than general EM faculty. Faculty appreciated the course, found it helpful, reported practice changes and increased comfort with doing and supervising the procedure.

**Conclusion:** This was a novel simulation for faculty learners. It was helpful, well received, and we were able to document a level of performance in our faculty credentialed to do the procedure. Lessons learned included multi-site coordination, rigorous rater training, and the difficulty of trying to create a meaningful cut score. Combining the psychomotor and Dreyfus scales with the checklist was useful. This level of simulation training and assessment of EM faculty has not previously been described.