

## VIRTUAL ROOM 2 POSTERS

Faculty Moderators: W. Christopher Golden, MD & Scott Lifchez, MD

### **Poster 1: Skill Retention Following In-person vs Video Resuscitation Training of Filipino Nursing Students**

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**Background:** The Philippines has a high neonatal mortality rate (14 per 1,000 live births). Helping Babies Breathe (HBB) simulation training has been shown to reduce early neonatal mortality in low-resource settings. However, there is concern that resuscitation skills decay over time and the frequency of refresher training to ensure competence in skills such as time to initiate bag mask ventilation (BMV) is not well-described.

**Aim:** To assess the retention of resuscitation skills by Filipino nursing students in Mati, Philippines when refresher HBB coursework is delivered in-person vs remote tele-coaching over video.

**Methods:** Second year nursing students (n=49) were trained in HBB; pre- and post-training scores on a validated OSCE were documented, including time to initiate BMV. Participants were then divided into 2 month, 4 month, and 6 month follow-up and further divided within these time-based groups into video or in-person refresher training, for a total of 6 novel groups. OSCE was administered to test retention, with time to initiate BMV as the primary outcome.

**Results:** During pre-testing, no student successfully performed BMV prior to 1 minute. Immediately post-training, 73% of students performed BMV before 1 minute with an average time of 57.9 seconds. Students retested at 2 months averaged 83.7 seconds while students retested for the first time at 4 months averaged 90.2 seconds prior to BMV initiation, with no significant difference between groups ( $p = 0.198$ ). At 4 month follow-up of students retrained at 2 months, average time to BMV improved to 70.4 seconds. There was no difference in skill decay between in-person vs video groups at 4 month follow-up ( $p=0.77$ ). Due to COVID-19 restrictions, 6 month follow-up was unable to be completed.

**Conclusions:** Skill decay improves after single refresher at two months. Virtual training may be a reasonable alternative to in-person training as there was no difference in skill decay between these groups. This may be particularly important when considering educational modifications made necessary by pandemic restrictions. Further studies are necessary to assess retention of skills after initial training by telecoaching as well as long-term skill retention.

### **Poster 2: The Virtual PICU Rotation: A New Learning Platform for Residents and Medical Students**

**Authors:** Diana Angelika Steppan, MD, MPH, Julia Noether Ashworth, MD, Amanda Bettine Levin, MD

**Needs and Objectives:** Requirements for social distancing early in the COVID-19 pandemic forced us to minimize in-person staff, resulting in home call and self-directed learning for non-essential pediatric residents. To continue the educational opportunities for PICU residents despite very limited in-person teaching, we created a platform that combines self-directed learning with live and recorded Zoom educational sessions. Subsequently, this platform was expanded to include a virtual rotation for medical students and residents from partnering institutions.

**Setting and Participants:** The Virtual PICU Rotation participants were JHU medical students, JHU pediatric, anesthesia, and emergency room residents, and JH All Children's Hospital pediatric residents. The rotation occurred in the JHH PICU.

**Description:** The rotation was modified to accommodate remote rounding and educational participation. PICU rounds were already occurring via Zoom and use of an iPad on wheels to minimize team size and practice social distancing. Remote residents/students received morning handoff by phone, pre-rounded in the EMR, joined rounds via Zoom, and presented patients remotely. Their in-house resident counterpart presented a physical exam and the remote resident/student presented an

assessment and plan. A Sharepoint website was created that contained an educational calendar with Zoom links for all live teaching and for recorded educational sessions in addition to a compilation of web-based PICU-oriented learning modules from existing resources (OPENPediatrics and LearnICU) for self-directed learning. Given the ability to attend rounds via Zoom and have access to all live educational sessions and web-based content, we successfully piloted a virtual PICU rotation.

**Evaluation:** Learners provided informal feedback throughout the rotation and formally during a debrief session at the rotation's end and in written rotation evals. Feedback received has been positive from both virtual and in-person residents/students and cited by the pediatric residency as a model for other rotations.

**Lessons Learned:** A virtual rotation with participation in patient care, rounds, and multimodal learning enhances learning for both in-person and remote residents/students. It provides versatility while still accomplishing the rotation's objectives. We envision that this virtual PICU rotation is a step towards allowing trainees from outside institutions, perhaps even low-income countries to experience the JHH PICU without costly travel.

### **Poster 3: Implementation and evaluation of a simulation-based shock curriculum in Manila, Philippines**

**Authors:** Sarah E Gardner Yelton, MD, Cañete Ramos, MD, Carolyn J. Reuland, Paula Pilar G. Evangelista, MD, Nicole A. Shilkofski, MD, MEd

**Background:** Children in low- and middle-income countries are disproportionately affected by shock, resulting in high rates of mortality. Simulation has been successfully used in some low-resource settings as an educational tool for medical professionals.

**Hypotheses/Aim:** The objective of this study was to develop and evaluate a simulation-based pediatric shock curriculum for pediatric residents in Manila, Philippines. We hypothesized that implementation of this curriculum would decrease time to administration of first bolus on a simulated mannequin, in addition to improve resident comfort and knowledge with respect to shock recognition and management.

**Methods:** In this prospective pre/post cohort study, we assessed a shock curriculum consisting of a written pre/post-test and a videotaped simulation-based objective standardized clinical examination conducted before and after the intervention. The curriculum was implemented in March 2020 with 24 Filipino pediatric residents. The primary outcome was time to initiation of fluid resuscitation. Secondary outcomes included improvement in confidence, knowledge on a written assessment, and performance in simulation, which was measured with a checklist.

**Results:** The time to initiation of fluids did not change between the baseline simulation (median [interquartile range] = 71.5 seconds [52-116.5]) and the final simulation (68 seconds [52.5-89];  $P = 0.42$ ). Confidence in identifying shock, identifying malnutrition, managing hypovolemic shock, managing septic shock, and placing intraosseous access all increased ( $P < 0.01$ ) post-intervention. Written test scores showed no improvement, but the total score on the checklist improved from 10 [8.5-11] to 15 [13-16] ( $P < 0.01$ ).

**Conclusions:** In our study of a simulation-based shock education program for pediatric residents in Manila, Philippines, we showed improvement in confidence and knowledge with respect to shock concepts. Through international collaboration, it is feasible to establish a successful simulation-based education program in a low-resource setting.

### **Poster 4: Implementing a Volume-based Feeding Protocol to Optimize Enteral Nutrition Delivery in a Neurosciences Critical Care Unit**

**Authors:** Gimmie Vallanca I,2 , Linda Costa I , and Valentina Goularte I | School of Nursing, University of Maryland Baltimore 2 Neurosciences Critical Care Unit, The Johns Hopkins Hospital

**Background:** Patients in a neurosciences critical care unit (NCCU) receive tube feeding (TF) at a fixed hourly rate through rate-based feeding (RBF). They are at a higher risk of underfeeding and malnutrition due to increased caloric requirements and frequent feeding interruptions. Recent studies about volume-based feeding (VBF) demonstrate higher efficiency in meeting patients' nutritional goals than RBF.

**Aim:** To optimize TF delivery, this quality improvement (QI) project aims to integrate VBF into routine practice involving nurse-driven TF rate adjustments to compensate for feeding interruptions and to meet daily TF volume goals.

**Methods:** A pre- and post-study design was conducted in a 24-bed NCCU with approval from institutional review boards. The implementation team provided in-services to multidisciplinary teams virtually, nurses demonstrated competency through an online quiz, and champions provided just-in-time education sessions. Sustainability measures included policy adoption, poster display, and delivery of timely feedback. The primary outcome was the proportion of TF-days meeting 80% of the volume goal. Secondary outcomes were protocol compliance, feeding intolerance, and hypoglycemia.

**Results:** From a total of 104 patients (RBF=57, VBF=47), there were 194 episodes of TF (RBF=97, VBF=97). Each episode denotes at least a day of receiving TF in a defined seven-day period. An independent t-test revealed more patients received TF-days meeting the 80% volume goal ( $p < 0.001$ ) and fewer hypoglycemic episodes ( $p = 0.03$ ). T-test also showed no significant difference in feeding intolerance episodes ( $p = 0.83$ ). Provider and nursing staff compliance rates during the 12-week implementation period were 72% and 68% respectively. Weekly compliance rates were threatened by staff turnover in the setting of the COVID-19 pandemic. However, the weekly average TF-days meeting 80% of the volume goal does not appear to be significantly affected (FI 1,85=1.72;  $p = 0.08$ ).

**Conclusion:** Implementation of VBF delivered more TF volume than the previous feeding modality through RBF. The QI project posed some sustainability challenges due to the complexity of the intervention and competing unit priorities during the ongoing COVID-19 pandemic. However, implementing a unit-based policy with multidisciplinary commitment, deploying champions, providing timely feedback, and employing multimodal education strategies may explain sustained effective TF delivery during the implementation period.

### **Poster 5: Role for an extracurricular vision screening service-learning program in medical education**

**Authors:** Eleanor Burton, BA, Lama Assi, MD, Fasika A Woreta, MD, MPH, Bonnielin K Swenor, MPH, P PhD, Thomas V Johnson, MD, PhD

**Background:** Although more than 90 million U.S. adults are at risk of serious vision loss, medical school curricular hours dedicated to ophthalmology are low and declining. Lack of exposure to ophthalmology in medical school is problematic for recruiting medical students to pursue a career in ophthalmology and for adequately training general practitioners to perform basic eye examinations, recognize common eye problems, and know when to refer patients for ophthalmic specialty care. Extracurricular ophthalmology activities, such as participation in community vision screenings, may serve an important adjunctive role in medical school curricula through exposure to the field and opportunities for skills training. The JHU **V**ision **S**creening **I**n **O**ur **N**eighborhoods (ViSION) Program (formerly Student Sight Savers) is an example of a voluntary medical student-directed community service-learning program. Characterizing the role of such initiatives in medical education is an important first step in closing the gaps within medical school ophthalmology education.

**Aim:** We aimed to describe the characteristics, interests, and ophthalmology experiences of medical students who participated in ViSION compared with those who did not.

**Methods:** We conducted a cross-sectional survey of all Johns Hopkins University School of Medicine students actively enrolled in the MD program during the 2019-20 academic year. Survey respondents answered questions regarding demographics, career and service interests, involvement in ophthalmology-related activities, and confidence with ophthalmology-related exam content and clinical skills. Responses were compared between JHU ViSION Program volunteers and non-volunteers using Fisher's exact chi-square test.

**Results:** There were 118 respondents (~25% response rate), of which 26 (22%) were ViSION volunteers. Overall, ViSION participants reported greater involvement in ophthalmology-related research (42% vs. 4%,  $p < 0.001$ ), and a significantly greater percentage of ViSION participants planned to apply to ophthalmology residency programs (34.6% vs. 1.1%,  $p = 0.001$ ). ViSION participants also reported greater confidence with their ophthalmology knowledge and clinical skills, including feeling at least fairly confident with ophthalmology content on clinical shelf exams (62.6% vs 21%,  $p = 0.003$ ) and having at least some confidence assessing visual acuity (61.6% vs. 29.4%,  $p = 0.002$ ) and estimating intraocular pressure (54% vs. 8%,  $p < 0.001$ ).

**Conclusion:** Student-led community vision screening programs may provide a useful adjunct to medical school ophthalmology curricula.

## **Poster 6: Innovation and Education in Healthcare Disparities**

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In a virtually modified, collaborative “design-a-thon” setting, this initiative has hosted high school students from across the United States for a 48-hour long virtual program. By developing a unique model that integrates teamwork, problem-solving, and mentorship, we hope to increase education regarding healthcare disparities and equity, engender positive feelings regarding engaging healthcare professions, and increase students’ curiosity and motivation to develop and promote community-based interventions to allow them to address healthcare disparities in their own communities.

We ran our most recent “sprint” in mid-August, virtually. We utilized programs like Zoom and Slack to facilitate group activities. In our past event, we included challenge areas that focused on healthcare disparities that pertained to COVID-19, such as testing in underserved communities, in addition to other challenge areas that dealt with environmental justice. For each challenge area, students will be prepared with a mentor and craft a potential solution. We plan to use a similar, virtual format for our upcoming event.

We have measured students' engagement with our program and how their knowledge has grown in areas of social determinants of health via utilization of before and after surveys. Among our 38 responses, 97.4% (37 v. 1) felt high schools did not sufficiently address social determinants of health within their curriculum. On a survey provided before and after the event, participants were asked to rate their general knowledge of healthcare disparities (0 = not at all familiar and 5 = extremely familiar), our participants demonstrated an increased knowledge of healthcare disparities (3.85 v. 4.08). We additionally found that 92.1% (35 v. 3) of our participants felt an increased interest towards a career revolving around such a subject.

We conclude that the utilization of high school design-a-thon programs specializing in healthcare disparities can allow an earlier and broader understanding of structural and sociological factors that impact health as well as foster an increased interest in the subject.

## **Poster 7: At an Arm’s Length; Creation of a Virtual Casting Workshop**

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**Needs and Objectives:** The COVID-19 Pandemic required physical distancing and pushed learning into a virtual platform. Family Medicine Accelerated Track (FAMTI) students receive 8 weeks of education in June/July intentionally designed as hands-on education. Virtual learning required innovation

to keep students engaged and provide hands-on experience for the FMAT I musculoskeletal (MSK) week. The broad goals for MSK week curriculum design were: interaction, active learning, and flipping the classroom. The objective for the short arm cast workshop was to maintain an interactive learning environment while introducing a specific skill.

**Setting and Participants:** Nineteen FMAT I students on four teams were tasked for a team name, colors and mascot to enhance interaction during virtual learning. Methods for active learning included student presentation of integrative medicine topics, an end of the week OSCE, and the hands-on casting workshop. Collaboration occurred between the sports medicine physicians, methodology lab, and Department of Medical Education to print and distribute nineteen 3D printed short arms and casting supplies.

**Description:** Computed tomography DICOM data was utilized for segmentation to print the arms. With the campus closed, methodology lab printers were moved to the unit manager's house with each arm requiring ten hours to print. Introduction to the workshop included a newly created video demonstrating how to "cast" the 3D printed arms. The workshop was then conducted through four virtual breakout rooms with one physician leading each group.

**Evaluation:** Free-text student evaluations showed uniformly positive activity assessment, with one suggestion for improvement; efforts for interaction despite virtual learning were notably appreciated.

**Lessons Learned:** This teamwork approach allowed for successful student interaction despite a virtual distanced format. Timely and collaborative communication was crucial given a tight timeline. Adequate description of the prototype was needed to allow extraction of appropriate volumetric data. The initial printing needed modifications to increase the web space between the thumb and forefinger, requiring changes in the segmentation. Future modifications would include standardized stabilization of the arm during casting, an arm provided to each instructor, and further modification of the hand portion of the arm model.

### **Poster 8: Evaluating rapid-cycle deliberate practice vs. mastery learning in training nurse anesthetists on the Universal Anaesthesia Machine ventilator in Sierra Leone.**

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**Background/Aim:** Underserved sub-Saharan countries have 0.1-1.4 anesthesia providers per 100,000 citizens, below the Lancet Commission's target of 20 per 100,000 needed for safe surgery. Most of these anesthesia providers are nurse anesthetists, with anesthesiologists numbering as few as zero in some nations and 2 per 7 million in others, such as Sierra Leone. In this study, we compared two simulation based techniques for training nurse anesthetists on the Universal Anaesthesia Machine Ventilator—rapid cycle deliberate practice (RCDP) and mastery learning (ML).

**Methods:** A 2-week Universal Anaesthesia Machine Ventilator course was administered to 17 nurse anesthetists in Sierra Leone. Seven were randomized to the RCDP group and 10 to the ML group. Participants underwent baseline and post-training evaluations in three scenarios: general anesthesia, intraoperative power failure, and postoperative pulmonary edema. Performance was analyzed based on checklist performance scores and the number of times participants were stopped for a mistake. Statistical significance to 0.05 was determined with the Mann-Whitney U Test.

**Results:** Checklist performance scores did not differ significantly between the two groups. When the groups were combined, simulation-based training resulted in a statistically significant improvement in performance. The highest-frequency problem areas were pre-oxygenation, switching from spontaneous

to mechanical ventilation, and executing appropriate treatment interventions for a postoperative emergency.

**Conclusion:** Both RCDP and ML are effective methods for simulation-based training to improve nurse anesthetist performance with the Universal Anaesthesia Machine Ventilator in three separate scenarios. The data did not indicate any difference between these methods; however, a larger sample size may support or refute our findings.

### **Poster 9: The Case for Human Trafficking Curriculum in Undergraduate Medical Education: A Student Perspective Needs Assessment Survey**

Authors: Michelle E. Darko, MS, Eric Helm, BS, MS3, Florida International University Herbert Wertheim College of Medicine

**Background:** Human trafficking is defined by the US Department of Homeland Security as “the use of force, fraud, or coercion to obtain...labor or commercial sex [acts].” Among trafficking survivors, over 80% have reported having contact with the healthcare system during their victimization, yet only 2% reported being identified as trafficking victims during a clinical encounter. To date, only four U.S. medical schools incorporate human trafficking into their academic curriculum. Furthermore, almost no studies identifying the need for human trafficking training in undergraduate medical education (UME) exist to date.

**Hypotheses/Aim:** This study aims to identify the most salient knowledge gaps among medical students in how to identify and use the tenants of trauma informed care to treat victims of human trafficking.

**Methods:** An anonymous, classroom-based questionnaire was developed and administered to second-year medical students at a public allopathic medical school in Miami. The questionnaire was composed of multiple choice and free response questions designed to identify potential gaps in students’ knowledge of human trafficking and trauma-informed care.

**Results:** Data collected from a total of 106 medical students indicate that 59% of survey respondents either disagreed or were neutral to being knowledgeable about human trafficking. Of those who reported having knowledge about human trafficking, only 5.2% reported learning about trafficking within a structured curriculum. When asked to provide a free-text care plan if approached by a trafficking victim, 25% of respondents reported they did not know, 15% reported that would contact law enforcement without patient consent, and 8.5% knew to use a human trafficking hotline.

**Conclusion:** Information on human trafficking in medical school curricula across the United States remains suboptimal. This survey demonstrates the need for human trafficking training among a group of US medical trainees to ensure that victims are referred to appropriate resources and further harm to this vulnerable community is not done. If physicians are to support victims/survivors of human trafficking, adequate training is necessary. To obtain a more comprehensive needs assessment, this survey is currently being extended to medical school educators at three other medical schools in Florida.