Objectives: Ultrasound (US) as a diagnostic tool has become invaluable to the care of a medically ill patient. In Internal Medicine (IM) Residency, there are multiple knowledge gaps with regards to teaching US. Some barriers to effective training include: 1) Time constraints; 2) Unfocused expectations; 3) Disjointed transition from Simulation (Sim) training to clinical application; 4) Loss of motivation in the adult professional learner; 5) Lack of a standardized approach. Successful learning leads to lasting change in practice. In the adult professional learner, we suggest that this practice modification is best achieved through Sim of high stakes events commonly seen by the learner. This paradigm sets a stage for standardized, effective, targeted and motivated learning, which can be applied to US education. We have developed a case-based Sim approach to teach our IM residents to integrate US into their clinical practice. These instructional resources/concepts are applied: 1) 5:1 learner: instructor ratio; 2) Skill stations; 3) Immediate feedback via Poll Everywhere audience participation; 4) Laerdal SimMan 3G; 5) Hands-on US; 6) Clear gel or water task trainer; 7) Opaque gel task trainer; 8) Standardized patient (SP); 9) US and echo view stations; and 10) Debrief sessions.

Discussion: Our instructional paradigm is exemplified by our Hemorrhagic Shock session. This is a scenario encountered often by our IM residents. Attaining confidence in management of this scenario is the motivation for these adult professional learners. The learners were divided into Lab Group 1 and 2. In Lab 1, a Sim Man scenario of a catastrophic Upper Gastro-Intestinal bleed is set up. As the case unfolds over 25 minutes (min), the learners are guided through focused learning objectives, outlined in Table 1. Audience- response questions, via Poll Everywhere web program, are displayed in real- time and are used at poignant moments during the case. This allows for immediate feedback and review of each of the learning objectives. The case concludes with a five min debrief session. In Lab 2, three skills stations are set up for task- based US training relevant to the Sim case: 1) Peripheral venous access training on clear and opaque gel trainer; 2) Central venous access and localization on SP; and 3) Inferior Vena Cava (IVC) image acquisition and interpretation on SP. The learners are introduced to the equipment and objectives at each station, then freely rotate for 25 min, participating in supervised practice with personalized feedback at each task.

Conclusion: Simulation training at the level of IM residency has proven effective for training in a wide spectrum of medical performance, from Advanced Cardiac Life Support management\(^1\) to cognitive decision making.\(^2\) Post-course survey data
revealed that our approach to US education was well received by the learners. There was an improvement in confidence levels for the management of these clinical cases presented. These learners were subsequently noted to utilize the learned skill sets during the care of real patients encountered on their clinical rotations. Thus, we conclude to have identified an efficient method for bedside US education within the constraints of a busy IM Residency: that is, a case-based paradigm which melds Sim-Man, task-trainer and SP training. We anticipate that our instructional paradigm will prove to be an educational approach that will allows the IM resident to retain skill sets for later use. Success hinges on laying an adherent groundwork of professional motivation by creating high stakes encounters commonly seen in their clinical work and addressing key learning objectives at the task-station level.

References
Objectives: Nowadays simulation is almost synonymous with interactive technology, whether it is screen-based or manikin-based, or using actors as standardized patients and relatives.\textsuperscript{1,2} It is important to remember that simulation covers a very wide spectrum and that what often matters most is the facilitation process rather than the technology used. Our innovation is a simple, low cost, yet interactive approach that we have developed to run clinical scenarios engaging learners in uni or multiprofessional groups into higher cognitive processes. It is followed by a debriefing as occurs in more traditional “physical” simulation sessions. Large groups of learners, limited access to patient simulators, simulation rooms, and medical equipment in general have encouraged us to look at other ways of delivering training that stretches learners “on their feet” but is also very educational. We have come up with an approach that we have named “Visually Enhanced Mental Modelling” (VEMM). The visual enhancements of this approach allows learners to join the scenario at different stages yet to see the “current situation” and receive a handover from current scenario participants.

Discussion: As opposed to full-scale clinical scenarios, case studies are usually narrated by an educator according to a predetermined set of events and outcome with regular interactions with learners.\textsuperscript{3} During our VEMM scenarios learners are required to verbalize their thoughts and actions as they respond to the case. Instead of a “physical” patient, a poster represents the patient with any important cues that correspond to the start of the scenario (e.g. wounds, marks...). A facilitator records important aspects of the discussion, timing, and provides information about the patient condition as the case progresses and according to the assessment verbalised by the learners (e.g. 10:22am chest auscultation; equal and normal bilaterally). Equipment labels are attached to the patient poster (e.g. oxygen mask, giving set/fluids...) by the facilitator and physiological parameters written on the whiteboard as procedures are performed in a verbal manner. This approach engages learners on their feet and can be run with multiprofessional teams. We have used it in several programs including the evaluation of new clinical practice guidelines, new clinical staff orientation and evaluation, as we well as prior to the launch of a new acute care patient retrieval program.

Conclusion: The briefing and clarification of expectations of learners, the educators’ facilitation style, the presentation of information to learners about the patient during the scenario (e.g. writing vital signs, describing response, displaying
monitoring applied) and how clarifications are sought by educators with regards to equipment use and settings made by learners (i.e. clarifying ventilator parameters selected to decide on the effect on the patient condition) is critical to the realism and success of this type of activity to test the understanding of their actions and the proper course of treatment. VEMM requires the same levels of scenario preparation than high-fidelity simulation, but instead of planning for physical pieces of equipment and instruments, laminated photos are used and the patient is replaced by a poster. The debriefing process can be identical to a traditional session. This activity has allowed us to observe the same type of clinical or human factor errors that are committed during actual or simulated patient care interventions. Our use of VEMM scenarios has been highly praised by learners and external faculty. The additional feedback received from candidates is that it is an activity they particularly welcome prior to any full-scale simulation session.

References
**Evaluation of Novel Esophageal Stent Placement Simulator** (10034)

Monday, January 12, 2015, 3:54 - 4:06 PM  
Presenter: George Alyateem  
Professor: Dena Higbee, MS, CHSE

**Objectives:** Esophageal strictures can have profoundly negative effects on a patient’s well-being, and lead to complications such as dysphagia, malnutrition, aspiration, pain, and respiratory failure. These strictures can present difficulty in management and may require intervention to relieve the stricture-related complications. While there are multiple avenues for intervention, including brachytherapy, radiotherapy, and surgery, esophageal stent placement is a commonly used approach for treating dysphagia, presumably due to its minimal risk of patient morbidity in comparison to alternative treatment modalities and long-term effectiveness compared to balloon dilation. Fluoroscopy has become the conventional approach for guiding stent placement. There is a learning curve associated with stent placement, and physicians must be trained to properly deploy the stent in the desired location. The use of fluoroscopy in this training increases the physician’s exposure to harmful radiation. A novel solution developed by the Center for Cardiothoracic Simulation at UNC-Chapel Hill allows for fluoroscopic guidance to be simulated without the negative effects of radiation exposure. Modifications of the simulator would allow for a radiation-free training environment for esophageal stent placement.  

**Discussion:** The purpose of this study is to evaluate a novel esophageal stent placement model under simulated fluoroscopy in terms of face, content, and construct validity. The following are specific aims: 1) Design and fabricate a model esophagus that will be used to simulate a fluoroscopically guided esophageal stent placement; 2) Recruit participants from various skill levels (novice, intermediate, and expert) to participate in the simulation; 3) Evaluate simulation in terms of face, construct, and content validity. Face validity: subjects will be asked to quantify the similarity of the simulation to fluoroscopy-guided esophageal stent placement in the clinical setting. Content validity: subjects will be asked to determine the usefulness of the simulation as a training tool for esophageal stent placement. Construct validity: performance metrics (time of procedure, accuracy of placement, time under fluoroscopy, etc.) of subjects will be compared across the board.

**Conclusion:** Total number of subjects: N=16 (five from each category of experienced, novice, and no experience, and one “expert” responsible for grading stent placement in construct validity). Construct validity will be analyzed by comparing the mean performance variables for the three groups (experienced, novice, and no experience), using a two-tailed independent samples t-test. Results from the questionnaire used to test face and content validity will be compiled in excel and presented in graph form with statistical averages for each category tested.
on the Likert scale. Expected outcomes: With ever-increasing pressures on surgical performance, the profession is in need of training systems that are both reproducible and validated. It is the expectation of the investigator that the proposed simulator is proven meet both of these requirements in terms of face, content, and construct validity. Ultimately, it is expected that the model is deemed realistic by the results of the questionnaire, and that it’s utility as a training tool is apparent. Alternatively, if the simulator does not meet these demands, the data collected can be used to improve upon the existing simulator for future iterations.

References
INNOVATIVE IDEA
WORK IN PROGRESS
ABSTRACTS
**Objectives:** Repeated applications of the Interprofessional Education (IPE) curriculum, using different simulation modalities, can enhance retention in learning. Manikin simulation has been shown to enhance teamwork and the addition of standardized patients can improve communication skills with healthcare providers, patients, and relatives in student participants. Virtual simulation has previously been used as a training modality by itself, but not as a prerequisite in preparing student participants for hands-on simulation. Simulation sessions with manikins or standardized patients are labor and cost intensive. To facilitate appropriate learning during these sessions, prior preparation of student participants is usually required. Preparation includes reading material and lectures, with a demonstration of what to expect during the simulation. Virtual Simulation is a new and unique tool in education that allows computer-aided simulation of virtual reality to introduce material and improve understanding of participants on a topic, in our case, the actual hands-on simulation. With the use of Virtual Simulation, in addition to reading material and lectures, we hope to improve our students’ knowledge, skillset, and performance during the actual simulation. **Discussion:** Fourteen Case Scenarios were designed for both the actual hands-on simulation and the Virtual Simulator (CliniSpace Virtual Simulator, http://www.clinispace.com/). Facilitators, Raters, Standardized Patients, and Manikin Operators received appropriate training on the clinical scenarios. Student participants, in addition to reading material and lectures, were each to receive a one hour virtual session on CliniSpace with a facilitator, which was to serve as their preparation for the IPE team-training simulation. Twenty seven out of 53 medical students received the virtual simulation training. Thirty three out of the 64 nursing students were able to participate in the virtual simulation training. The actual manikin and standardized patient simulation consisted of 12 scenarios with varying levels of complexity (four cases in acute care hospital setting and 2 emergency room settings with four cases each). Outcome measures included: 1) Post Virtual Simulation Survey; 2) Nontechnical Cognitive Skills (NTCS) Virtual Simulation Evaluation; 3) Pre and Post Inter-professional Education Perception Survey; 4) NTCS Student Self Reflection; 5) NTCS Rater Evaluation; 6) Evaluation of IPE Simulation Experience; and 7) Standardized Patient Evaluation of the Student’s IPE Simulation.

**Conclusion:** The cohort of students who participated in the virtual simulation scored higher in the NTCS evaluation during the IPE Simulation versus those that
did not have the virtual simulation. This is a work in progress and the final result will follow. In addition, those that did not participate in virtual simulation commented that they would have liked more education on what to expect during the simulation, that they were ill prepared for the simulation, and that they had not been exposed to IPE prior to the actual simulation, and therefore did not know how to effectively communicate during the simulation. Our preliminary results show that virtual simulation can improve the knowledge and skillset of students on IPE prior to the actual simulation exercise. Providing virtual simulation may be cost effective in improving the outcome of IPE performed with the use of simulation. The provision of virtual simulation requires appropriate investments and logistic planning due to the need for more sessions in order to provide the virtual simulation experience to students.

References
Objectives: First Debriefing Olympics took place during the Annual Meeting of the Society in Europe for Simulation Applied to Medicine (SESAM), 2011. This workshop is for improving individuals debriefing skills by comparing their own style with others. In this workshop, all debriefers saw a video-based scenario of the simulation and then debriefed the role-players who play the role of the video. The audience and judges were able to evaluate their debriefing styles and “best” debriefer was voted. Since 2011, it was held not only in SESAM but also in SimHealth and IMSH. Moreover, Debriefing Olympics were held in the Academic Meeting of the Japan Society for Instructional Systems in Healthcare (JSISH) in the local language. Debriefing Olympics in Japan started in 2013, and in 2014 we added some innovative approach for making more interactive workshop to improve participants learning effectiveness and satisfaction by using audience response systems and Debriefing Assessment for Simulation in Healthcare (DASH). In this research, we report the results and some discussions about Debriefing Olympics in Japan.

Discussion: Second Debriefing Olympics in Japanese took place during the Academic Meeting of JSISH, March 6 to 8, 2014. At this time, the theme of simulation was an assessment of the patient whose condition has deteriorated rapidly at emergency outpatient. The video-based scenario is available on YouTube. The simulation was done by one novice nurse and one simulated patient. The video was about 40 seconds and played twice. There were two debriefers, and debriefing demonstration and short explanation of their debriefing style was done one by one. After debriefings, two debriefers were voted from audiences by audience response systems. "DASH - Student Version Short Form" was used for criteria for evaluations with a little change of expression. There are 6 elements in this form, but "Element 1: The instructor set the stage for an engaging learning experience." was skipped because the stage of debriefing was already set up. After the voting, discussion of their debriefing style was done with audiences. At the end of the workshop, the question about the satisfaction of this workshop was asked with three levels: good, so-so, and bad.

Conclusion: Thirty seven audiences voted of debriefers. The results of DASH were following. In four elements that are The instructor maintained an engaging context for learning”, “The instructor structured the debriefing in an organized way”, “The instructor provoked in-depth discussions that led him to reflect on his performance” and “The instructor helped him see how to improve or how to sustain good
performance”, debriefer B got higher score. However, in “The instructor identified what he did well or poorly - and why” debriefer A got higher. Voting was done five times with different observing points of DASH, so the assessments were done with more precision. The question about the satisfaction was answered by 32 participants. The number of answers “good” was 23 (72%) and that of “so-so” was 8. This result shows that the Kirkpatric’s level one (reaction) was achieved. This program was innovative in that following 4 points: (1) Debriefing Olympics were held in Japan, that is in Asia, and the satisfaction of participants was acquired (2) interactive Debriefing Olympics was done by using audience response systems (3) the voting of debriefers with the same criteria by using DASH (4) participants were able to not only enjoy the Debriefing Olympics but also learn the basic concept of DASH.

References
Improving Enrollment Rates for Clinical Research Studies in Critically Ill Children: A Novel Approach to Obtaining Informed Consent (10203)

Monday, January 12, 2015, 3:30 - 3:42 PM
Presenter: Christine Bailey
Professor: Heidi Lane, EdD

Objectives: Proper informed consent is essential for safe and ethical clinical research. Obtaining informed consent for pediatric trials is challenging\(^1\), particularly in the ICU. Parents may feel rushed or overwhelmed\(^2\), consent forms are dense, and the care is complex. These issues may result in poor understanding and retention.\(^1\)-\(^3\) Despite these challenges, formalized training for consenters on how to obtain informed consent or what constitutes best practices is rare. The 34-center HALF-PINT trial (NCT01565941; U01 HL107681) had lower than planned enrollment. Study coordinators were asked to identify difficulties with obtaining consent. Responses included time-sensitive eligibility criteria, study complexity, and ICU-related stress. Consenters reported that parents asked questions they were unprepared to answer, and acknowledged occasionally alarming parents with off-hand remarks. These challenges are common to research in the pediatric ICU. Learning how to therapeutically communicate is essential. A training program was created to improve informed consent across study centers. Best practices were identified and simulated encounters were conducted at the bedside to immerse consenters in the learning environment, while eliminating risk to patients and parents.\(^4\)

Discussion: The HALF-PINT study teams from Boston Children’s Hospital and the Children’s Hospital of Philadelphia (CHOP) identified the top reasons why eligible parents decline enrollments. They partnered with the CHOP Center for Simulation and Family Consultants, and the Standardized Patient (SP) Program at the U. PA’s Perelman School of Medicine to design a 3-phase project: 1) live simulations; 2) creation of training videos; and 3) remote Skype sessions with SPs. Challenging scenarios with scripted responses were created for the simulated parent. The scenario allowed the consenter to practice therapeutic communication techniques for informed consent. Debriefings were held to help determine best practice themes, provide feedback on communication, and discuss alternative strategies. Family Consultants shared how communication behaviors could be perceived by parents. Participants received immediate feedback on their performance and then replayed the scenario. The project was piloted locally and at a national research conference with the HALF-PINT study team. Additional best practice techniques were discovered during this multi-site session. Recorded sessions aided in the debriefing process and brief video examples were saved for future educational forums.
Conclusion: Anticipated results and outcomes include improving consenting skills of study team members locally and nationally as evidenced by increased study enrollment and study team members reporting improved confidence and self-perception of performance while obtaining informed consent. The hope is for the pilot of improving informed consent to become a generalizable learning experience to assist in training informed consent best practices for other pediatric studies as well. The ultimate goal is to protect patients and families and to empower them to make the best informed medical decisions for themselves.

References
Objectives: Valuing what is realistic and seeking to assess readiness for clinical practice, nurse educators strive to ensure that their students are indeed prepared for the real world of nursing. Nursing students have limited time in the clinical setting and are rarely exposed to classic obstetric emergencies such as a prolapsed cord, pre-eclamptic seizure, or a meconium newborn in crisis. The authors therefore believe that there is a need to strengthen student confidence with regard to obstetric emergencies. When utilizing reflective journaling in learning, students have on occasion, specifically credited simulation as a tool by which their clinical competence was increased. Utilizing thematic analysis, the authors then began to identify the simulation elements which were most valued by students. This study aims to demonstrate that students perceive themselves to be more mentally and physically prepared for taking care of obstetric and neonatal patients in crisis when faculty utilize the simulation lab for these scenarios.

Discussion: Through a thematic analysis of reflective journals, it was noted that students commented positively regarding the value of obstetrical simulations in enhancing learning. In a reflection, a student stated that he felt a reluctance to assume the role of primary nurse in a simulation that involved an obstetrical emergency; however, this student reflected in a subsequent journal about a clinical experience involving an obstetrical emergency following the simulation experience. The student expressed satisfaction in being more confident in providing care for this type of patient. While didactic engagement is important, there is no learning substitute for being in an emergency scenario. Students will anonymously answer likert scale questions regarding their perception of their own preparedness before and after the simulation. Post simulation, students will reflect on the experience by journaling. The clinical area is an ideal place to foster critical thinking through reflection. As a student reflects on significant clinical practice experiences, the student can develop self-awareness that leads to improvement in practice. This reflection exercise will assist in determining whether there is an increased perception of preparedness for obstetrical emergencies.

Conclusion: Since nurse educators cannot create nor predict deviations from the norm within the acute care setting, perhaps the next best learning tool is the simulation lab. It has become common practice for medical students, physicians, and acute care nurses to utilize simulation for emergency preparedness training. It would deem logical that undergraduate nursing students would glean similar
benefits. Additionally, Alderman\(^1\) concluded that utilization of simulation in obstetric emergencies actually improved team cooperation and communication, thereby improving safety. Crofts, Winter, and Sowter also purported that obstetrical emergent training ...is associated with improvement in clinical outcomes.\(^2\) There is much research to support the benefits of simulation in obstetric nursing education.\(^4\) This two semester study will seek to gain understanding as to the readiness impact of obstetrical emergent scenarios on junior level nursing student following the simulation experience, and whether the experience has indeed prepared them for the real world of nursing.

References
5. Partin JL, Payne TA, Slemmons MF. Students’ perceptions of their learning experiences using high-fidelity simulation to teach concepts relative to obstetrics. Nursing Educ Persp 2011; 32: 186-188.
INNOVATIVE IDEA
WORK IN PROGRESS
ABSTRACTS

Board #407

*Crisis Resource Management in the Delivery Room* (9061)
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Gillian Brennan, MD
Professor: Heidi Lane, EdD

**Objectives:** Resuscitation of the critically ill neonate not only requires medical knowledge and clinical skills, but also requires important non-medical skills such as crisis resource management (CRM). CRM refers to leadership, problem solving, situational awareness and communication skills in high-stress environments. CRM has been shown to be effective for airline pilots, anesthesiologists, and pediatric ICU physicians, among others. Thus, CRM would serve a valuable role in the neonatal intensive care unit (NICU) and delivery room. Despite the clear importance of CRM, few pediatric residency programs incorporate CRM into their curriculum for residents rotating through the NICU. The aim of this project is to measure the effect of CRM training on resident performance and stress levels in simulated neonatal resuscitation scenarios.

**Discussion:** This is a prospective randomized control study. All pediatric residents will be eligible to participate. Pediatric residents will be randomized to two groups: 1) 1-hr CRM instruction (CRM group); or 2) no CRM training (control group). A one-hr didactic review NRP session will be given to both groups. Each resident will assume the role of team leader for one neonatal delivery room emergency scenario. Video recordings will be taken of the residents during their scenarios in order to score the performance for delay in treatment and deviation from NRP. Reviewers will also rate the residents on their non-technical performance using the Ottawa Global Rating Scale for crisis management. This scale rates the subject’s performance in five key areas of CRM. Raters blinded to which arm of the study the residents are in will score the video recordings. In addition, salivary swabs will be performed on each resident before and after the scenario to measure salivary alpha-amylase, a marker of stress. All residents will also complete the State-Trait Anxiety Inventory forms.

**Conclusion:** Our hypothesis is that those pediatric residents who undergo training in CRM will have improved clinical as well as CRM performance in simulated neonatal resuscitation scenarios. We also hypothesize that those residents who undergo CRM will have decreased stress response, as measured by salivary alpha-amylase and the State-Trait Anxiety Inventory form, as compared to those residents who do not receive CRM teaching prior to the simulated neonatal resuscitation scenarios. To our knowledge this is one of the first projects to look at the importance of CRM in neonatal resuscitation. We will be using measures of clinical performance, non-technical CRM performance, physiological measures of stress and the participant’s perception of stress. Positive results from this project would
support the need for more extensive CRM teaching to be an integral part of residency training in the NICU setting where residents frequently encounter crisis situations in the delivery room. This project is cost effective. Much of the materials needed are pre-existing validated surveys or rating tools. References


Objectives: Proper credentialing in CVC is paramount to minimize complications and ensure safety. Our hospital system’s current credentialing process mandates performance of ten, proctored bedside CVCs to be granted privileges. This process, however, is difficult to complete in peripheral hospitals due to limitations in proctor availability and opportunity. It further, negates the benefit that increased hospitalists and advanced care practitioners provide. While providers are available, they are often not credentialed to perform CVC. The effectiveness of simulation-based training is well documented. Trainees who undergo simulation based training programs for CVC require fewer needle passes and have fewer catheter related blood stream infections.1,2 Performance assessment during simulated CVC placement has shown to correlate with experience and competency in live patients.3 Checklist based competency used in the simulation setting with competent providers demonstrates lower complication rates as compared with traditionally trained providers.4 The objective of our project is to develop an alternative simulation-based credentialing pathway that will steam line, standardize, and increase availability of competent providers privileged in CVC.

Discussion: A simulation-based credentialing process involving web-based didactic modules on best practices in CVC and simulation-based testing has been developed. Mandatory didactic modules demonstrating ultrasound guided CVC have been incorporated into our system’s learning management system. A video outlining CVC using simulated trainers has also been included to allow participant familiarization with these trainers. To assess performance, a previously validated checklist4 is being used. This checklist has been optimized based on expert input from four disciplines: surgery, EM, IM, and CCM at an urban teaching hospital. Modifications reflect changes in accepted standards of CVC since publication, addition of critical errors, and determination of weights to each line item. Following completion of the learning modules and passing (80%) a knowledge-based post-test, participants will complete a simulator-based assessment in ultrasound guided IJ and femoral CVC. Assessment will be completed in real time by a simulation technologist trained in CVC as well as independently by experts via video review. A checklist pass rate of 80% will be required to certify successful completion and allow for subsequent performance of two, proctored bedside CVCs for formal credentialing.

Conclusion: We anticipate that by using simulation-based competency assessments, our hospital system (which employs nearly 900 hospitalists and advanced care practitioners) will stream line and standardize credentialing for
procedures such as CVC. By completing this simulation-based credentialing, and decreasing the number of proctored bedside CVC from 10 to 2, we expect that more hospital providers will be able to perform CVC safely across our hospital system. Data collection and analysis will focus on resources required for implementation of a simulation-based credentialing program across a large healthcare system. We will also determine inter-rater reliability between the simulation technologist and expert checklist assessments while also comparing a cohort credentialed via the new alternative pathway to those credentialed in the standard pathway. Participants credentialed via the simulation-based pathway will be tracked to determine the number of central lines placed after successful credentialing. Also, procedure-related complications and outcomes will be tracked and compared to those credentialed via traditional pathway. Our ultimate goal is to demonstrate the effectiveness and safety of a new simulation-based credentialing pathway.

References
Board #409

**iPad Defibrillator Application to Support the Improvement of Time to Defibrillation** (8468)

Monday, January 12, 2015, 4:18 - 4:30 PM  
Presenter: Cheryl A Camacho, NRP  
Professor: Heidi Lane, EdD

**Objectives:** Review of data from our in situ Code Blue program, revealed that time to defibrillation ranged from four minutes to 14 minutes thus we were failing to meet guidelines set by the American Heart Association.¹ We identified the primary cause of this variation was due to lack of familiarization in use of our organizations defibrillator. In order reduce our time to defibrillation to below the three minute AHA guidelines, our clinical and virtual simulation teams collaborated to develop a mobile tablet-based defibrillator training application.² The objectives of this project are to: 1) Reduce time to defibrillation by familiarizing healthcare professionals with common defibrillator functionality (Zoll M series); 2) Create an application that could be used by multiple types of healthcare professionals; 3) Provide convenient access to education anytime/anywhere utilizing web and mobile platforms; 4) Develop education to increase patient safety; and 5) Keep development costs to a minimum by focusing training on the problem areas instead of modeling the entire Zoll device.

**Discussion:** We drew from three primary data sources: 1) Observations of in-situ code blue simulations; 2) interviews with hospital staff from in-situ simulations; and 3) Feedback from faculty. We learned that healthcare providers struggled most with operating the defibrillator. We determined that an iPad application emphasizing steps of defibrillation¹ would be an ideal approach to improving time to defibrillation.² Drawing from previous game design and AHA guidelines we developed a virtual Zoll trainer.¹,² Our development team provided preliminary testing which included heuristics³ and usability testing. We conducted early face validity testing with a group of five content experts internal to our organization. Our measures included functional, contextual, and software bug analysis. Tester feedback allowed us to iterate improvements to the application (e.g., improving instructional language, identifying critical pathways, and adherence to AHA Guidelines.¹ Following IRB approval, next steps include site and sample selection to conduct pilot testing the application with a training program. Our measures will include usability, correlation to the clinical environment, and identification of common failure points.

**Conclusion:** With further testing, we hypothesize that the virtual Zoll trainer will lower defibrillation times by improving healthcare professionals understanding of the processes of defibrillation. In addition, we believe our strategy of creating a tablet application to distribute this training will further support our goals by
lowering barriers to accessibility. We anticipate this approach may also support the resolution of human system interaction errors thus increasing patient safety. We further anticipate that this pilot project will inform future instructional designs that can be applied to other equipment utilized within our healthcare system (e.g., infusion pumps).

References
Objectives: Evolution from novice nurse to competent nurse is a challenging and stressful transition. The Institute of Medicine (IOM), Commission on Collegiate Nursing Education, along with various focus groups and healthcare organizations advocate for Nurse Residency Programs to facilitate this transition. The Standards for Post Baccalaureate Nursing Programs clearly define key elements of a core curriculum for a Nurse Residency Program, yet there is no recommendation for the inclusion of simulation to apply the knowledge and skills. Most Nurse Residency Program curricula include didactics, precepted clinical experiences and mentored activities. The Nurse Residency Program with Simulation offers the direct application of theoretical knowledge that is learned through traditional methods. Simulation is also effective for reinforcing behavioral skills related to communication, and teamwork. And it is a key strategy for providing safe patient care, retaining Nurse Residents and allowing the Nurse Residents to learn without fear of jeopardizing patient care. Clinical Simulation has now become an integral part of the program because it offers standardized learning experiences and supports the ability to evaluate competence development.

Discussion: Review of the literature suggested Nurse Educators are challenged to provide effective learning opportunities for a new nurse. A gap analysis of the current Nurse Residency Program recommended specific enhancements at the completion of 2013. With this information a decision was made to incorporate simulation into the Nurse Residency Program. With simulation we could provide innovative educational experiences and assist new nurses develop clinical competency, promote teamwork, and improve patient care processes. Simulation provided opportunities to practice timely completion of tasks, delegation, communication and technical skills that are necessary in a pediatric emergency. A cohort of educators from various units developed a curriculum with high fidelity simulations. Novice nurses were expected to recognize a deteriorating pediatric patient and respond accordingly. Immediate debriefing using video recording enhanced the learning experience. The simulation session was incorporated after completing the American Heart Association PEARs course (Pediatric Early Assessment, Recognition and Stabilization) so they could apply newly acquired knowledge and skills. It was important for the Nurse Residents to be successful so we could celebrate their accomplishments.
Conclusion: Simulation-based learning was chosen to enhance the program experience while appealing to technology interests of today's nurses. The 2013 Nurse Residency Program evaluation responses were significant and validated the need to incorporation Simulation into the future curriculum. Comments included; Code scenarios could be a little more interactive and more like a real life situation, I feel that the sim will be better for the mock codes, I do feel that going over code sheets were very helpful. However, I think learning would have been more enhanced in a simulation versus watching a video. The 2014 comments included It allowed a safe environment to work through a code without fear of harming a patient, safe, non judgmental environment, Great emphasis on working on teamwork, I like how it challenged my critical thinking skills, course was excellent, debriefing really solidified my learning, and simulations more often. The evaluation results demonstrate that the enhancement of Nurse Residency Program with simulation is truly a celebration of learning! We will continue to incorporate simulation scenarios into the Nurse Residency Program and our next goal will be to develop curriculum that includes more simulations at multiple points in the program.

References
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Objectives: Simulation-based training has been demonstrated to be effective and has been adopted widely in health professional education but access by some groups is limited, particularly in rural settings. In recent years several authors have described methods for delivering remotely facilitated simulation based training (RFS), where the instructor facilitates via video-conferencing, as an alternative method to face to face or locally facilitated simulation (LFS). \(^1\)-\(^3\) Studies evaluating videoconference-enabled RFS have employed mainly quantitative outcome measures from instructors and participants. While generally positive, some participants report discomfort suggesting room for improvement. \(^2\) No studies have yet described how remote facilitation is perceived by learners and instructors. Aim: To investigate learners’ and instructors’ perceptions of RFS compared to LFS.

Discussion: A standardized immersive simulation based training course on the topic of the deteriorating patient was modified to deliver one quarter of its four pause-and-discuss style scenarios by RFS using video-conferencing with the remainder of scenarios delivered in the conventional manner using the LFS format. After their completion of a course 30 newly graduated doctors or nurses, representing a cross section of 154 course participants, were invited to participate in a semi-structured telephone interview addressing their perceptions of LFS and RFS. In each course two instructors alternated between facilitating scenarios locally in the simulation laboratory and remotely from a purpose build remote facilitation room. The Instructors were interviewed together after the course using the same interview guide as for the course participants. The interviews were transcribed and analysed by two of the authors using Malterud’s method for systematic text condensation. Malterud’s method is a four stage approach to thematic cross-case analysis of qualitative data to text analysis passing through gestalt impression, systematic coding, condensation of codes to themes and meaning units and in the final stage, synthesis and conceptualization.

Conclusion: Twenty-one course participants were interviewed and the analysis of these interviews is completed. Participants’ perceptions of LFS and RFS was explained as perceptions of the learning processes which varied for some between the two modalities. We identified two major interdependent themes: Psychosocial including emotion, belonging, responsibility and Cognitive including engagement with task, conscious mental effort and control of attention (table 1). Subthemes including surveillance, comfort and contextual understanding had both psychosocial
and cognitive elements. Perceptions were influenced by pre-existing learner attributes and ‘enabling’ factors related to the training delivery. Conclusion from participants’ interviews found that their perceptions of the learning processes can vary between RFS and LFS and may influence its effectiveness. Fourteen instructors completed the interviews and we report first step of the instructor interviews analysis. Preliminary analysis suggests as emerging themes human interaction, including verbal and non-verbal communication, engagement and belonging. When analysis of the instructor interviews are completed we aim to present an insight in how remotely facilitated simulation based training can be delivered in respect to learning processes.

References
**Objectives:** Cardiac auscultation is an essential skill for students of medical disciplines. There are many methods used for training students in the acquisition of that skill including using standardized patients (SPs). Since SPs are typically healthy individuals with normal findings, the number and range of conditions that students can be exposed to is limited without the use of one of many technology applications meant to enhance cardiac auscultation in clinical simulation. The ECG-based stethoscope tracking technology described in this abstract aims to improve the process of obtaining abnormal cardiac auscultation findings when using an SP, making the simulation event easier for the SP and more true to life and reproducible for the students.

**Discussion:** The ECG-based stethoscope tracking technology consists of a modified stethoscope head that picks up the ECG signal from the site where the stethoscope is placed. Characteristics of the ECG signal are used to predict its location. In 2013 a research study was done to test the accuracy, precision, and sensitivity of the classification algorithm. The study showed that the technology can function reliably irrespective of an SP’s body position, gender or body mass index. Two versions of the algorithm are being developed that will hopefully further improve the classification algorithm which should shorten the time between placing the stethoscope head onto the torso and identification of the anatomic site. The first version involves an algorithm that is specialized to each of ten SPs using the data collected from the previous study. The second version is a generalized algorithm using data from all ten SPs. A study is underway to determine the effectiveness of both algorithms. Once classification improvements are realized, the technology will be ready to incorporate into a prototype stethoscope to test the feasibility of using the technology for cardiac auscultation teaching and assessment on SPs. Programmed heart sounds or augmented real sounds are feasible next steps.

**Conclusion:** This technology, while not dissimilar in the approach to currently available static technologies, will greatly enhance the user experience for the standardized patient and the student for cardiac auscultation during a clinical simulation. The ultimate goal is that using the experimental stethoscope designed for simulation will approach the realism of using a standard stethoscope for cardiac auscultation. A stethoscope designed for simulation embedded with this ECG-based tracking technology has the potential to provide a realistic experience for the student with no increased workload for the SP during a simulated encounter.
References
Board #413

**Multidisciplinary Neonatal Training, Better Together** (9794)

Monday, January 12, 2015, 4:06 - 4:18 PM

Presenter: Dr Victoria Davies, MB, ChB, MRCHCH
Professor: Russell Metcalfe Smith

**Objectives:** The Royal College of Paediatrics and Child Health (RCPCH) are advocating integration among inter-professionals in the workplace as reflected in the formation of the Foundation of Child Health within the RCPCH. At the undergraduate level, different professions train separately and often this continues at a postgraduate level and even in the work place. Increasingly it is recognized that multidisciplinary team training is a more effective training method in the management and improvement of difficult clinical scenarios.

**Discussion:** Just over a year ago, regular multidisciplinary neonatal simulation was established in Leeds Children’s hospital. The aim was utilisation of simulation to strengthen non-technical and technical skills. Simulation sessions would occur either in situ or in our simulation centre and we used a combination of high and low fidelity manikins. Simulation was set up for multidisciplinary team training and single professional sessions were avoided were possible. Sessions were made accessible to everyone working on the neonatal unit; this would include neonatal grid trainees, registrars, junior doctors, neonatal sister, staff nurses, advanced neonatal nurse practitioners and students from different disciplines.

**Conclusion:** In the last year we have run 18 neonatal simulation sessions, involving over 150 staff. Only three sessions were single profession and those were in the former half of the year when the training program was still relatively new. On average there is one registrar; 2.5 SHO; three nurses; 0.3 ANNPs (advanced nurse practitioners); 0.2 students per session. The multidisciplinary faculty also represented our working together ethos. On average there is 0.7 consultant; 1.8 registrars and 1.3 nurses facilitating each session. During debriefing candidates reflected on numerous learning points. These ranged from human factors in situational awareness and sharing mental models to knowledge deficits in resuscitation algorithms and medication. Latent errors including equipment failure, medication and system issues were identified and acted upon to improve patient safety. Feedback forms from candidates demonstrated an improvement in mean confidence score in managing similar crisis scenario from 2.9 to 4.2 (5-point Likert Score) pre and post simulation training.

**References**

None listed.
Board #414  
**To Act or to Educate? What is My Role in the Simulation?** (8314)  
Monday, January 12, 2015, 4:18 - 4:30 PM  
Presenter: Cinnamon a Desgres  
Professor: Russell Metcalfe Smith  

**Objectives:** Participants will differentiate between the role of the actor and the role of an educator in simulations.

**Discussion:** A review of the literature was conducted to find articles about the role or training of embedded actors and limited information was found. This initiated the development of a survey to investigate the use of actors in simulation and what their functions are. Survey questions include functions of both actors and educators for facilitators to choose from. This survey was piloted with several healthcare professionals who utilize simulation as facilitators and/or case developers. The final survey has seven items. The survey was distributed electronically through approved social media sites on the of SSH and INASCL. Subscribers to these two groups are typically simulation users in hospital, academic and training centers and other specialty simulation groups. The answers from the survey will provide data on the characteristics of current roles utilized in simulation. This data will be correlated with the characteristics associated with each role’s current definition.

**Conclusion:** Conclusions in progress: The current definition of the role of embedded actor falls short of encompassing their valuable role in simulation education. Providing instruction or feedback to the participants during or after the simulation extends beyond acting, and should be credited as such. A professional in this role who assesses the knowledge, skills and attitudes of the participants in the simulation session and then provides the appropriate education intervention is better defined as an educator. The results of this survey will support the need to define and develop a new role in simulation sessions.

**References**
Objectives: In 2012, the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Emergency Medicine (ABEM) introduced a new method of evaluating the progress that a resident in emergency medicine will make during his or her residency. These were 23 different milestones. They are a scale rating from level 1 to level 5 which maps the progress of a resident from the level of a graduate medical student to the level of a first year attending and beyond. Although the milestones are extremely comprehensive in comparison to the previous core competencies they raise all sorts of problems in the manner of consistent evaluation and remediation. Some of the milestones cannot be evaluated effectively in the clinical area and remediation often depends on the patients seen which may not be timely based on the resident’s needs. When looking at this problem in residency education, the best and most effective method to achieving both evaluation and more specifically remediation is medical simulation. Medical simulation allows goal focused education and also to simulate situations such as death notification, which may not happen on a frequent basis in some institutions especially for junior residents.

Discussion: This project proposal is to take each milestone and create a simulation case that could be adjusted based on each level. Using these simulation cases, a resident in need could be evaluated or even remediated to catch up with his or her peers. This allows a resident to get valuable education while also not having a public remediation done in the clinical area allowing better learning. The initial project would take one procedure milestone and one communication-based milestone and create a case for both. Using these cases, residents would be remediated using a baseline level from evaluations from the clinical area. Using this baseline, the resident would be run through the case until they effectively completed the necessary steps to achieve the next level in the milestone. In the following months, the resident’s evaluations in the clinical area (which are completed on a weekly or shift basis) would be observed to see if there was an improvement in these areas and an increase in evaluation level.

Conclusion: Using medical simulation, residency leadership could remediate residents on specific milestones or evaluate residents on milestones they may not have received enough evaluation on in the clinical area by supervisors. I believe that this would be a very useful tool for residency leadership especially if it could demonstrate improvement in milestone level. If there is an improvement, then this project could be expanded to include all of the milestones and thus be used as a national model for remediation in residency education.
References
The emergency medicine milestones: a validation study.
Korte RC1, Beeson MS, Russ CM, Carter WA; Emergency Medicine Milestones Working Group, Reisdorf EJ.
Emergency Medicine Residents Perception of CPR Quality in a Simulated Intubated Patient in Cardiac Arrest

Monday, January 12, 2015, 3:42 - 3:54 PM
Presenter: John Erbayri, MS, NREMT-P, CHSE
Professor: Mitzi Scotten

Objectives: The purpose of this study is to evaluate the EM physician’s ability to accurately access three components of high-quality CPR by others and their own perception of themselves providing CPR in a simulated patient in cardiac arrest.

Discussion: Emergency Medicine (EM) physicians are designated as the team leaders for any critical patient that presents to the emergency department. When these patients are in cardiac arrest the EM physician must ensure that all procedures conducted by other healthcare team members are done properly. With the necessity of uninterrupted and high-quality CPR during a cardiac arrest EM physicians must be able to evaluate others’ CPR performance. Commercial devices are available that provide real-time feedback on CPR quality; however due to cost limitations most resuscitations are performed without devices. The resident learners will be given lectures on the current science and new methodologies used by pre-hospital professionals. Afterwards, the resident learners will be expected to perform one minute of chest compressions. CPR recording manikins, will be used to collect data in real time on the rate of chest compressions, the depth of chest compressions, and the amount of chest recoil. Conclusion: These parameters are a part of the standard education in an American Heart Association Basic Life Support (CPR) course. The resident learners will be divided into pairs when they sign in to the conference. Each pair will perform both roles as an evaluator and a compressor. When learner A does chest compressions, learner B will evaluate the performance of learner A. Learner A will also evaluate their own perception of the quality of their chest compressions. The two learners will then switch roles, such that learner B then performs chest compressions, which will be evaluated by learner A; learner B will also perform a self-assessment. Learners will complete an assessment form for educational purposes. Objective data will be collected by the CPR recording manikins. This data will be presented to the learners after both learner A and learner B perform chest compressions. When the scenario is completed, the information recorded will be used for immediate feedback. Once the debriefing is completed, residents will continue with the remainder of the required trainings. This objective data will compared to the subjective results collected by the resident learners.

References
None listed.
Objectives: Debriefing is the single most important factor for effective learning in simulation. There is a wide range of options for debriefer training, but little is known about the relative merit of these options and some debriefers may have no specific training at all. Similarly little is known about the contribution that the duration and nature of debriefing experience makes to the quality of debriefs delivered. We know that self-assessment is problematic in the clinical domain but it is unclear if this applies to debriefing also. As we know the debrief is the most crucial aspect of the simulation, if we can define those characteristics of an ideal debriefer, we can guide faculty development and move towards maximizing effectiveness of simulation based medical education. Our primary objective is to describe correlations between learner assessment of debrief quality, expert assessment and debriefer self-assessment. Our secondary objective is to reveal what patterns of debriefing training and experience are associated with the highest-scoring debriefs and discover if there are consistent patterns among those debriefs which do not score highly.

Discussion: This international, multi-centre mixed-methods is in the data analysis phase and complete results will be available in late 2014. Multiple debriefers from nine centres were videoed debriefing standardized anesthesia crisis simulations. In this way the learning objectives and content of the simulations were fixed but the characteristics of the debriefers were diverse. We collected demographic details from each debriefer regarding their training and experience in debriefing. Each debrief was rated in three ways with respective versions of the DASH tool: 1) Learner assessment; 2) Debriefer self-assessment; and 3) Trained independent rater assessment. We will describe the statistical correlations between these measures of debrief quality. Multiple linear regression will allow us to describe the relationship between the debriefers’ training and experience and the resultant quality of their debriefs. Results: We videoed 247 debriefs performed by 32 debriefers at 9 centres in two countries. Each encounter was self-assessed and learner-assessed at the time. We trained 13 international raters to score the debrief videos. Quantitative analysis is in progress. This will direct the purposive sampling for the qualitative phase which follows.

Conclusion: This study is to our knowledge the largest prospective observational study of simulation debriefing. Following the quantitative phase, the qualitative phase will involve reviewing the videos with selected debriefers then structured
interviews, transcription, coding and thematic analysis. This will further inform our conclusions regarding how to optimally train and evaluate debriefers. Future evolution of faculty development programs may be improved by considering data on characteristics of excellent debriefers. Examining a debriefer's insight into their debriefing performance and the validity of learner feedback will further inform the ways in which simulation programs and faculty development programs are evaluated and refined. Furthermore, debriefing the debriefers with their videos and scores engenders self-reflection and promotes improvement amongst study subjects.

References
None listed.
Objectives: Current methods of bedside data display in intensive care units require healthcare professionals to assimilate multiple sources of data located in separate physical and virtual locations in order to respond to time sensitive changes in clinical status. Such a system fails to facilitate pattern recognition essential for the trainee learning experience; thus is suboptimal for both ensuring patient safety and enhancing skill acquisition. Other high-risk industries have developed strategies to address these safety and human performance issues. In the commercial aviation industry, flight cockpits are designed to facilitate expedient assimilation of time sensitive data (the glass cockpit) and their implementation has been shown to reduce crew mental workload, prevent accidents/errors and enhance cost savings. Such a strategy may yield similar results when applied in healthcare. The aim of this study is to evaluate if simultaneous data display (patient problem list, vital sign trends/current vital signs, pertinent laboratory results, and most recent radiographs - see attached figure) at the patient bedside improves diagnostic accuracy and efficiency in a simulated neonatal intensive care environment.

Discussion: Forty healthcare professionals (pediatric residents, neonatology fellows, neonatal hospitalists and neonatal nurse practitioners) with a current NRP card who have worked in a NICU in the last 12 months will be recruited. Utilizing a prospective randomized matched pairs design with block randomization, subjects will interact with the simultaneous or conventional data display (simulated patient, bedside monitor, mobile computer) during a realistic clinical scenario for a preset period of time and then crossover to the other display, each subject serving as their own control. Subjects will be asked to list 10 patient problems, complete an objective test to further discern the patient's diagnoses and provide feedback comparing the two displays. Statistical Analysis: Recordings will be stored on a secure server and reviewed to determine the correct number of diagnoses per unit time. Diagnostic efficiency and accuracy will be compared with a paired t-test. Role of experience on time to reach diagnosis will be evaluated by an ANOVA model. Subjective assessment of the two data displays will be achieved via completion of a survey using a Likert scale.

Conclusion: This study will yield the first objective data on optimal methods of data display at the bedside. Should the simultaneous data display strategy prove superior to conventional display it will inherently decrease the time for physicians...
to recognize and act on a patient’s changing clinical status, which will improve patient safety and accelerate the process of transitioning from a novice learner to an expert clinician, simply by altering the clinical environment.

References
Board #419

**Simulation to Fill in Milestones** (8312)
Monday, January 12, 2015, 4:18 - 4:30 PM
Presenter: Christopher Gallagher, MD
Professor: Mitzi Scotten

**Objectives:** Just how you can divide up the Milestones and make sure they are adequately evaluated can be a real headache for Residencies everywhere. We demonstrate here how you can incorporate Milestones into a simulation exercise.

**Discussion:** Simulation can provide a good opportunity to fill in Milestones, in particular the softer Milestones tied in with Interpersonal and Communication Skills, Professionalism, and Systems-based practice. In this abstract, we demonstrate how we have done just that.

**Conclusion:** Careful analysis of the Milestones yields opportunities for simulation exercises. This can form a useful adjunct to documenting that residents are progressing through the Milestones.

**References**
Board #420

**Five Years' Experience with MOCA: What Have We Seen?** *(8315)*

Monday, January 12, 2015, 3:30 - 3:42 PM

Presenter: Christopher Gallagher, MD  
Professor: Marian Luctkar-Flude, RN, MSN, PhDc

**Objectives:** The MOCA process (Maintenance of Certification in Anesthesia) has been in place for five years. Our center was the first to conduct a MOCA simulation, and thus we are in a position to have observed participants for the longest time in the MOCA system. We present some common themes that tie in with patient safety.

**Discussion:** Over five years, we have seen several recurring themes among MOCA participants.

**Conclusion:** Most MOCA participants resent having to do this, viewing it as a tax. Thus at the start of the program, they are generally unhappy. Most MOCA participants enjoy and like the experience, thus by the end of the course, they are happy. If one issue appears again and again, it's the inability to apply and deliver a shock in timely fashion.

**References**

Board #421
SSH Nursing Section: Development of a Simulation Scenario Validation Tool
(8144)
Monday, January 12, 2015, 3:42 - 3:54 PM
Presenter: Marie Gilbert, RN, DNP(c), CHSE
Professor: Marian Luctkar-Flude, RN, MSN, PhDc

Objectives: The 2013 Nursing Section Scenario Library Needs Assessment Survey identified that the majority of respondents recognized the rigor required to develop clinical simulation scenarios and the time consuming nature of this scholarly activity. While 72.24% self-reported they had enough education and training to write a clinical simulation scenario, only 29.30% self-reported enough sufficient education and training to validate a clinical scenario. Following this survey the Nursing Section initiated a collaborative workgroup to develop a peer review tool to validate scenarios.

Discussion: The Nursing Section Survey also identified members who were interested in becoming involved with the development of a scenario validation tool. These members were contacted and 8 members agreed to participate in the collaborative workgroup. This group expanded by two after the first meeting. A total of six online meetings occurred between November 2013 and March 2014. Current literature, the California Simulation Alliance Validation Tool and member’s expertise were used to develop and refine the validation tool.

Conclusion: At the time of submission the Nursing Section is planning to evaluate the reliability of the validation tool. Much interested has been generated regarding the validation tool and several members have already began to use the tool in research and for teaching scenario development. A need was identified in a national survey that a validation tool would be a useful resource for simulation educators. Over a five month period ten SSH members worked collaboratively to develop and refine such a tool. The next phase for the Nursing Section is to evaluate the reliability of this tool.

References
None listed.
Mock Rounds Simulation Improve Pre-clinical Medical Student Oral Presentation Skills (10046)
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Sean Gnecco, MD
Professor: Marian Luctkar-Flude, RN, MSN, PhDc

Objectives: Little is known about how oral presentation skills are learned, yet they are an important part of patient care and an essential component in teaching clinical medicine to medical students.¹² Medical students find these skills hard to master and educators find them difficult to teach.³ However, they are among the primary methods clinical preceptors use to assess communication ACGME competency. One of the objectives of the pre-clinical clerkship Advanced Introduction to Clinical Medicine course is to improve the oral presentation skills of our students before entering their core clerkships where they will be required to present patients orally on a daily basis. Traditionally, we have used two student oral patient presentations based on clinical patients, one formative and one summative, to assess the oral presentation skills of our students. Recently, we have introduced into the curriculum a Mock Rounds Simulation, as an innovative use of high-fidelity simulation, to provide students a controlled environment with a simulated patient encounter, and give students additional opportunity to practice bedside oral presentation skills and to receive formative assessment and feedback.

Discussion: During each of the two hour simulations, teams of three students see three simulated patients (SIM MAN 3G), with the same chief complaint, but with different etiologies for the complaint. Each simulation has three 40 minute phases: 1) On-Call Admission: Students on-call are asked to evaluate three patients in the Emergency Department for Admission. Students must complete a focused history and physical, order diagnostic studies and interpret their results, and initiate any stabilizing treatment; 2) On-Call Room Preparation: Students return to their call room to prepare their oral presentation and are allowed to work collaboratively and use any resources available to them to prepare their assessment and plan; and 3) Making Morning Rounds: Students select one primary presenter for each case and must give the attending a SOAP note format oral presentation of the patient they are caring for. The attending will give formative feedback as the student presents their patient and give the student opportunity to start over several times until they reach the presentation objectives.

Conclusion: After introduction of the Mock Rounds Simulations into the curriculum, student performance on the summative assessment of the oral presentation improved by 3.61% from 91.86% (198 students) to 95.47% (585 students). On anonymous student surveys, 86% of survey responders (out of 138) either agreed or strongly agreed that simulations were valuable building their
clinical reasoning skills. Furthermore, several open ended comments suggested that this format of Mock Rounds was preferred to the previous eight traditional simulations and were also helpful in improving oral presentation skills. Mock Rounds Simulations appear to be an effective tool for improving oral presentation skills in pre-clerkship students and are perceived as helpful and valuable by the majority of students. Our plan is to introduce additional Mock Round Simulation sessions in the curriculum and continue to explore other elements of the student learning experience in this category such as the role of anxiety in learning oral presentation skills.

References
Objectives: Our goal was to implement a team-based departmental simulation curriculum focusing on low frequency, high yield pediatric encounters in a community emergency room setting for all emergency department team members at a hospital with an annual pediatric census of 3,282 visits. We hypothesized that deliberate practice of such pediatric presentations, with emphasis on TeamSTEPPS®, could solve the problem of post-graduate skill and knowledge decay as well as improve the associated breakdown in communication and teamwork that may occur in low frequency experiences such as pediatric resuscitations in the emergency department.1

Discussion: An in-situ, high-fidelity simulation model was utilized for team training of emergency department staff who participated on a volunteer basis. Team was defined as one attending physician, one physician assistant, three nurses and one patient care technician. Nurses and patient care technicians were allotted time for course participation during clinical shifts. Attending physicians and physician assistants volunteered time outside their clinical responsibilities. Team training occurred weekly in the emergency department for two hours and included an introduction, three different simulated pediatric resuscitations, each followed by a pertinent debriefing, and conclusion. Upon course completion, all participants were emailed a survey to assess quality, relevance and impact of the simulation training.

Conclusion: Implementation of a departmental simulated pediatric emergencies team training curriculum is feasible at a single community emergency department for post-graduate level attending physicians, physician assistants, nurses and patient care technicians. Although one-hundred percent participation was not obtained, a majority of the eligible department team members attended the course. Based on survey data, there may be strong agreement that the simulation training will improve pediatric patient care as well as department teamwork and communication. Future studies should attempt to validate the impact of our program.

References
Objectives: Simulation has been identified as a method for improving patient safety and quality through teamwork and communication training. In addition, simulation provides exposure to a wide array of situations to supplement real-life clinical experiences, especially for events that are rare or high-risk. This is particularly true in Pediatrics, and thus, simulation has become an integral aspect of pediatric resident education. Simulation allows residents to gain experience without harm to a patient, provides a structured opportunity to evaluate resident interpersonal communication and clinical performance, and permits immediate debriefing. The Accreditation for Graduate Medical Education (ACGME) has developed The Pediatric Milestone Project for evaluating pediatric resident competencies in patient care, medical knowledge, professionalism, interpersonal skills, systems-based practice, and practice-based learning and improvement. These milestones are evaluated throughout resident education with the goals of measuring proficiency and progression from internship through the end of resident training. Simulation is a valuable venue to use in the evaluation of resident communication and clinical competency, and is a novel way to incorporate the new milestone-based assessments.

Discussion: In our residency program, we have created standardized simulations for our residents and a unique evaluation tool for each scenario based on selected core competencies from the Pediatric Milestone project. Selected competencies include: interpersonal and communication skills, professionalism, patient care, and systems-based practice. Residents are evaluated on their performance during cases such as: stabilization of a patient with myocarditis, an infant with croup, a child with head trauma, and a death and dying scenario with difficult conversations. Prior to this project, the residents were completing evaluations of their simulation experience but we did not have any individual assessments of the residents themselves. These milestone-based evaluations provide a means to track resident competency and document objective data regarding milestone-based performance. The simulations take place twice weekly and each resident participates several times annually, which will provide a wealth of data with which to track resident performance. We will present our experience using these evaluations, how they have enhanced our simulation training and competency assessments, and the impact on individual resident performance in interpersonal communication, patient care and medical knowledge.
Conclusion: Using milestone-based evaluations during resident simulation experiences allows for an objective, controlled measurement of competency, communication and interpersonal skills. The end result will allow us to better tailor our education of pediatric residents to improve patient safety and quality.

References
None listed.
Board #425

**Innovative Simulation Program for Multi-specialty ACLS Training** (8838)

Monday, January 12, 2015, 3:30 - 3:42 PM  
Presenter: andrew grock, md  
Professor: Frank Overly, MD, CPhys, FAAP

**Objectives:** Our goal is to introduce a high-fidelity simulation component to our hospital-wide ACLS classes. We expect to see increased comfort level, confidence, knowledge retention and improved ability to utilize a team-orientated approach in our six month, one year, and two year follow-up. In addition, we hope to identify specialty specific deficiencies to provide improvement areas for each specialty. We will give all residents traditional ACLS training, but will randomize the residents to either do the high-fidelity, residency specific simulation before versus after the traditional, low-fidelity manikin training. We will be comparing scores based on completion of critical actions and validated teamwork scores for each group during both the high-fidelity and low-fidelity session. We hope to show the benefit of a high-fidelity simulation session over a low fidelity one.

**Discussion:** Advanced Cardiac Life Support (ACLS) training is required for many healthcare providers with recertification required every two years. This training typically utilizes standardized, pre-made videos followed by resuscitation practice on low fidelity simulation manikins. Recent research has shown improved scores on the American Heart Association mega-code among paramedic students and medical students with high-fidelity simulation training.1,2 Nurses, pharmacy students, and internal medicine residents have all shown increased comfort levels and confidence after high-fidelity Simulation.3-5 Interestingly, one study comparing anesthesia residents and emergency medicine residents with ACLS simulation cases showed significant differences in performance – specifically, the anesthesiologists were more likely to intubate early and more likely to put the patient on a monitor. The specific deficiencies common to each specialty, and the changes to the ACLS course each deficiency requires, have yet to be elucidated.6

**Conclusion:** The results of this research can provide further information as to the benefit of both high-fidelity simulation for ACLS training and the application of specialty specific cases. We hope to elucidate deficiencies common to each residency to further emphasize the needed points in future ACLS classes.

**References**
Objectives: Advanced Cardiac Life Support (ACLS) training is required for many healthcare providers with recertification required every two years. This training typically utilizes standardized, pre-made videos to reinforce the algorithms followed by resuscitation practice on low fidelity simulation manikins. The ACLS course is ripe for application of recent advances in high-fidelity simulation. Previous research has shown improved scores on the American Heart Association mega-code among students who participated in a scenario-based performance-oriented team instruction method. Nurses, pharmacy students, and internal medicine residents have all shown increased self-reported comfort levels and confidence after participating in an ACLS Simulation. An additional meta-analysis, reported that skill retention decays faster than knowledge retention, and that this decay is detectable at six months to one year. They conclude that more studies are needed to determine the ideal frequency of re-certification. Our objective is to analyze skill and knowledge retention through a high-fidelity simulation case given at six months, one year and two years to all healthcare providers in our hospital requiring ACLS certification or re-certification.

Discussion: We will study approximately 182 ACLS providers that are eligible for initial or recertification. All residents will complete an initial data sheet which includes their specialty, the frequency of ACLS provided care, their current year of training, the number of years they have been ACLS certified, the approximate amount of time devoted to preparation before this session along with additional demographic data. All these ACLS providers will go through standardized ACLS initial or retraining pathway for ACLS certification. After which these providers will then be randomized into three arms: Arm 1 will re-certify every six months, Arm 2 will re-certify every year, and Arm 3 will re-certify the standard interval of every two years and will be our control group. Each retraining session will consist of three scenarios testing at least three ACLS algorithms, each followed by debriefing, on a high-fidelity simulator. The session will also include a standardized multiple choice test for retraining of the providers. Additionally we will include a validated scoring system to measure the team dynamics which is an integral part of implementation of real-life ACLS. ACLS certified instructors will supervise and evaluate the ACLS trainees to see if they achieved competency.

Conclusion: The results of this research can provide further information of the necessary standardized retraining sessions for ACLS providers or it may show that a
certain subset of medical specialist may not need to re-train while others may need more re-training. Also of importance, this study will be done with the application of a high-fidelity simulation training to ACLS cases. As current data shows that ACLS education is improved with high-fidelity simulation training, our project will determine re-certification frequency using the best methods of initial training available.

References
Objectives: Chest tube insertion is an urgent, life-saving procedure that all neonatal healthcare providers caring for ill neonates must be able to do competently and efficiently. In this era of gentler ventilation strategies and more conservative management of pneumothoraces, there is significant concern regarding current neonatology fellowship trainees’ ability to receive adequate experience in chest tube insertion to achieve competency. We recently conducted a national survey showing that nearly 20% of neonatology fellowship program directors reported having at least one fellow graduate in the past five years without having inserted a chest tube. This highlights the importance of developing novel tools for meeting training needs that are not available during clinical care. As there are no existing training models for chest tube insertion, we have designed a novel neonatal chest tube simulator. Our goal is for this simulator to be used to train & evaluate providers in appropriate chest tube insertion. There is evidence that the use of simulation-based educational interventions can translate skills from the learner’s simulator performance to patients1. Recent studies have shown that simulation-based procedural competency training can impact patient outcomes and decrease healthcare costs.2

Discussion: We have designed a novel neonatal chest tube simulator in collaboration with an engineer at Northwestern Simulation. The rib cage was designed using accurate measurements of ribs, thoracic spine & scapulae for term neonates (50th% for a 40 week term infant), based on literature review. The rib cage was then printed in two digitally blended connex materials on a 3D printer. Within the rib cage, we have created two hollow silicone inserts that serve as pleural cavities, that are subsequently filled with water in order to mimic pleural fluid. Water performs more effectively than air-filled cavities in our pilot testing. The external surface is covered with a synthetic silicone rubber skin that can be cut or punctured for the procedure. A key design principle is that the tool must be useable for two different chest tube insertion techniques, as both are used commonly in the field. We are currently in the process of evaluating this simulator using experts in neonatal chest tube insertion, including neonatologists, neonatal hospitalists and pediatric surgeons. A 15-item structured feedback form is being used to evaluate the simulator, consisting of 14 Likert scale questions and one question with a 4-point global rating scale.

Conclusion: Data from the feedback forms will be analyzed to inform a final round of model revisions and re-assessment. This tool will then be used as part of a neonatal chest tube insertion curriculum development project, with the goal of
providing a teaching tool & education product that can be shared across neonatal training programs. We anticipate following a mastery learning model similar to Wayne et al.3

References

Board #428
Integration of a Longitudinal Trauma Experience for Non-trauma Based EM Residency Programs Utilizing High-fidelity Simulation (9841)
Monday, January 12, 2015, 4:06 - 4:18 PM
Presenter: Dr. Kanika Gupta
Professor: Frank Overly, MD, CPhys, FAAP

Objectives: Management of traumatic illness is critical to EM training, however, most training programs do not have level 1 trauma receiving status. While residents at such programs rotate through trauma centers in an attempt to close experiential gaps, educational literature demonstrates that the impact of isolated bolus learning is inferior to that of balanced exposure spread over time. Access to high fidelity simulation is expanding across training programs and is an ideal modality to close these experiential gaps by providing a uniform experience over time. Objective: Develop a longitudinal simulation based trauma curriculum to standardize clinical exposure and education in this domain.

Discussion: A team of three EM residents participate in weakly recurring trauma simulations during the hour preceding their clinical shift. A tracking system prevents duplication of scenarios for each resident. Pre-session discussion covers the roles, responsibilities, and positioning of each trauma team member. Scenario content, derived from the EM Model for Clinical Practice, covers: burns, near drowning, trauma in a on-trauma setting, child abuse, neck trauma, penetrating chest trauma, massive transfusion in trauma, head trauma, GU trauma, trauma in pregnancy, multiple trauma, electrical injury, environmental. Debriefing covers cognitive challenges and clinical management augmented by video playback to highlight teamwork and communication skills. Educational handouts are emailed to asynchronously reinforce knowledge gains. Evaluation of the residents is formative.
Conclusion: Results: Competency in both clinical management and team based care significantly improved as residents progressed through the curriculum. Anonymous feedback by the residents was uniformly positive. Conclusion: High fidelity simulation is a practical modality to close experiential gaps in trauma training while improving teamwork and communication through deliberate practice.

References
None listed.
Objectives: Educators are faced with the difficulty of showing students the clinical relevance of the science they are learning. The challenge is likely more prevalent during undergraduate training as students are years away from exposure to a healthcare setting or patient experience. Therefore, finding avenues for undergraduate (UG) students, especially those in healthcare career tracks, to experience the clinical relevance of physiology to help student engagement, enthusiasm, and learning of physiology as well as help guide career choices. The use of high fidelity patient simulation (HFPS) may help with this. The purpose of this report is to share data and reflections on a HFPS experience for biomedical UG students. The two hour HFPS experience was part of an upper level UG course titled “Laboratory Virtual Simulations in Physiology” which is a mixed mode class consisting of lab modules and limited face to face lecture time. The HFPS experience was developed and facilitated by faculty from the University Central Florida College of Medicine and the School of Biomedical Sciences. With this experience we had three goals which included whether the activity was feasible within two hours, whether the students learn anything from the activity, and whether the students were engaged in the activity.

Discussion: A total of 34 UG students participated in the two hour HFPS session. The outline of the eight steps is listed below: 1) Pretest (10 mins) included five physiology (physio) questions; 2) Introduction (20 mins) – We briefed students on manikin and capabilities and how to approach a patient; 3) Simulation (SIM) case 1 (asthma, 15 mins) – half the students participated, while the other half observed. The faculty facilitator helped students discuss the basic physio learned in class and apply it to the HFPS scenario; 4) SIM case one debrief (25 mins) – We focused on basic physio (pulmonary function tests) and airway resistance; 5) Switch observers and participants; 6) SIM Case 2 (hemorrhage, 15 mins) -- Half the students participated, while the other half observed. The faculty facilitator helped students discuss the basic physio learned in class and apply it to the HFPS scenario; 7) SIM Case debrief (25 mins) – We focused on basic physio (hemodynamics) and the concepts of preload and afterload; and 8) Posttest (10 mins) – includes five physio questions. We plan to test longer term retention of these physio concepts and compare this with other content delivery methods such as lecture or laboratory exercise. We would also like to see if these activities affect career choice.
Conclusion: This study describes implementation of a HFPS activity into an UG biomedical class. The three things we addressed were feasibility of the activity in two hours, if was a learning effect, and faculty and student perception of the activity. The HFPS activity is feasible in two hours. Although it takes careful planning and coordination with the technical staff aiding in the control of the manikins and the setting, the logistics and work flow went smoothly. The most difficult aspect of the simulation is the distance between our medical school and main campus where the class is normally held (~25 miles). There was an increase on the posttest versus the pretest as the mean went from 1.72 to 2.57. Regardless, the data suggest a learning effect from this activity. Whether this learning is long term is a bigger question and needs to be addressed. When a student was asked to name one thing that she learned from the HFPS activity, she commented, Integrating everything we learned in physiology and applying it in the real-world setting. I was also able to get a better understanding of the concepts covered by reviewing them. We anticipate that long term retention of physiology material will be improved by this HFPS activity and future studies will be conducted to investigate this.

References
None listed.
Objectives: Patient care in the operating room (OR) is highly dependent on surgical teams. These teams consist of different providers with varying experiences and education. A well functioning team presumably results in improved and efficient patient care while contributing to positive work satisfaction (REF). Recently the MGH has begun a comprehensive surgical team training program. This program has involved surgeons, anesthesia providers, registered nurses, surgical technicians, and support services in team training activities. These activities frequently include simulation experiences in various education venues (REF our practicality of OR team training manuscript along with others). However, it is unclear how each member of the OR team views the use of simulation for OR team training. Also, although anesthesia providers and new surgical residents may have some simulation experience, the majority of the nursing staff does not have any appreciable experience with simulation nor team training. Therefore, the research question for this study was to understand how the nursing staff including registered nurses and surgical technologists perceived the effects of OR simulation training on themselves and OR teams in general.

Discussion: In developing our program for team training we have committed to allowing OR teams to practice and improve their teamwork skills within an in-situ environment. Team training simulation experiences are conducted within our operating room environment. We have designated three operating rooms for in-situ simulation-based activities. We have developed several scenarios ranging in length from 1.5 hours to 6.5 hour sessions. Continuing Education Units (CEUs) are awarded to all nursing participants and are specific to the length of the sessions. Emphasis is placed on team work skills including effective use of closed loop communication, assertiveness, and uses of surgical checklists. To date, there have been a total of 120 unique participants from the nursing staff. To conduct this study a literature review was undertaken and a survey pertinent to our research question was identified. The Attitudes Towards Healthcare Teams Scale (ATHCT) was modified to reflect the perioperative environment. An IRB-approved online anonymous survey will be sent out to 262 RNs and 106 STs from the MGH Perioperative Services staffing list.

Conclusion: The goal of this study is to understand the perceptions and attitudes of the nursing staff related to their experiences before and after a structured team training simulation based experience.
References
Objectives: Sidra Medical and Research Center is opening a new simulation facility to support the orientation and ongoing professional development needs of a new hospital in Qatar. In order to offer a functioning simulation program many steps have to be taken to prepare for a go live environment. Planning and execution of the program, the complexity of tasks, interactions of the roles and participant flow presented opportunities to explore a dedicated stage management role.

Discussion: As one component of a planned ‘Sim the Sim’ day, the role of Stage Manager was explored to highlight the variety and complexity of this role. The Stage Manager role mirrored many qualities utilized in a theatre production. Elements include planning, organizing, and communication, resources management and a global understanding of the program. Data was collected utilizing innovative technologies to allow for the tracking of movement, point of view experience and interactions.

Conclusion: Identifying the complexity of the Simulation Stage Manager role enabled clarification of the skill set required to perform the various tasks and meet challenges. This discussion will review observations from the experience and address how the role has been defined to benefit efficacy of program delivery. The evaluation process will enhance future directions of this and other simulation faculty roles.

References
Board #432

**Transforming the OB Simulation Experience for Entry Level Nursing Students**
(7987)

Monday, January 12, 2015, 3:54 - 4:06 PM

**Presenter:** Belinda Hermosura, MSN, RN, CHSE

**Professor:** Ilya Shekhter, MS, MBA, CHSE

**Objectives:** The objectives for this project are to: 1) Determine need for revision of OB simulation in curriculum; 2) Discuss how to transform the curriculum to meet the needs of students and faculty; and 3) Plan the OB Simulation Day.

**Discussion:** High fidelity simulation plays an important role in the development of nursing student.1 The obstetrical clinical experience in L&D is primarily observation. High fidelity simulation allows the students to use critical thinking skills and act in the role of the nurse2. The simulation provides a safe environment for student learning.1 At the University of Maryland, students originally used low fidelity simulation without debriefing as part of the orientation to the Obstetrical clinical rotation. Today, it is a full day with a high fidelity manikin and standardized patients in the role of the laboring woman and the family member.

**Conclusion:** Each of the clinical groups, spends one of their clinical days at the simulation lab at school. The simulation day starts with a briefing and familiarizing the students with the manikin and the equipment in the morning. The students are then divided into two groups. Each group participates in the simulation scenario as observers and as participants. The simulations are situations that students might not participate in at their clinical sites. Each of the scenarios includes a debriefing session. The simulation day includes student evaluations that are very positive.

**References**

Board #433  
**Effectiveness of Debriefing in American style CPR Training in Japan: From the Viewpoint of the Level 1 and 2 of Kirkpatrick’s Four-Level Training Model**  
(10001)  
Monday, January 12, 2015, 4:06 - 4:18 PM  
Presenter: Takanori Hiroe  
Professor: Ilya Shekhter, MS, MBA, CHSE

**Objectives:** To increase the resuscitation rate, bystander CPR is very important. So more and more effective training is needed. One of the method to make training effective is debriefing. The effectiveness of debriefing in simulation for the medical professionals have been confirmed by the previous studies. However, it is not so well known debriefing may or may not valid for bystander CPR training. Is it able to enhance CPR training for bystander by debriefing as with medical professionals course such as ACLS? American Heart Association (AHA) Guidelines for CPR And ECC was revised in 2010, visual materials for bystander (Family and Friends ® CPR; F&F) was released the following year. The Japanese version was released in 2012, it began to be used in educational institutions. F&F is the CPR training program for bystander and it needs few intervention by instructors.

In this study, debriefing, quiz and survey of satisfactions were done after F&F. The differences of learners satisfaction and educational effect were compared whether debriefing was done or not. The objective of this study is to survey the effectiveness of debriefing on simulation-based medical training for bystander.

**Discussion:** To survey the effectiveness of debriefing for students in CPR training, 330 first year university students Nursing, Physical Therapy, Occupational Therapy, Speech Therapy was divided into two groups at random. The training course was done in two groups. Group A (Non-Debriefing; 1) Pre-test; 2) F&F ; 3) Post-test and Satisfaction survey; and 4) Debriefing. Group B (debriefing): 1) Pre-test; 2) F&F; 3) Debriefing; and 4) Post-test and Satisfaction Survey. In order to avoid that the difference in educational contents, Group A has also performed the debriefing. Pre-test and post-test were based on F&F video contents and it was able to be classified into following three parts: (1) Chest compression with five questions, (2) Procedure before starting chest compression with four questions and (3) Knowledge without skills training session such as artificial respiration with four questions. All questions were asked by either-or choice. Debriefing was done with four people in each group and following three theme was used: 1) What was able to learn; 2) what was not able to learn; and 3) How to make it better in real situation. Satisfaction Survey was done with the same questions as our previous survey.

**Conclusion:** In both group A and group B, there were significant difference between pre-test score and post-test one (p<.05). It shows that F&F for first year
university students was effective and useful. However, there was no significant difference between two groups in both test scores and satisfaction survey. Therefore, it is not able to point that debriefing improved students learning results and satisfaction. These results may be caused by following two reasons: (1) the quality of debriefers (2) the contents of debriefing. Since not only in group B but also in group A there were significant difference between pre and post test, learners might have studied enough without debriefing. If they have learned with ordinal plan and achieved the learning objectives, debriefing is less need and learners confidence might be low in some situations. In current situation, achievement of level 1 and 2 of Kirkpatrick’s Four-Level Training Model are not increased by debriefing. Therefore, further research is needed about the methods for increasing learners satisfaction and learning.

References
Board #434

High-fidelity Simulation of Donation after Cardiac Death: Exploring Educational and Administrative Utility (8488)

Monday, January 12, 2015, 4:18 - 4:30 PM
Presenter: Jesse Hochkeppel, MD
Professor: Ilya Shekhter, MS, MBA, CHSE

Objectives: Project objectives: 1) Demonstrate the utility of high fidelity simulation in establishing interdepartmental clinical protocols; 2) Demonstrate the utility of high fidelity simulation for hospital administrative purposes; 3) Provide a platform for the use of high fidelity simulation in the creation of hospital learning modules; 4) Generate discussion regarding innovative uses of high fidelity simulation involving interdepartmental activities.

Discussion: A high-fidelity simulation (HFS) of terminal extubation for the purpose of organ donation after cardiac death (DCD) was created in our simulation laboratory. This is a rare clinical event that necessitates interdepartmental and inter-organizational coordination. Parties involved in the simulation included nurses, surgeons, anesthesiologists, intensivists, hospital administration, patient care services, transplant coordinators, and members of the New York Organ Donor Network (NYODN). The main intention of the simulation encounter was to help generate a learning activity for relevant clinical personnel. A secondary objective was to enable hospital administration the ability to observe the current protocol. Unexpected outcomes included the identification of multiple knowledge gaps and the necessity of revising the current protocol. Currently there are plans to record the HFS scenario following revision of the protocol to generate a learning module for the hospital. As this project evolves, it is our intention to document the process, record the perceptions and experiences of those involved regarding the HFS encounter, demonstrate the unique ability of HFS to identify specific knowledge gaps, and provide an example of the utility of HFS in interdepartmental clinical activities.

Conclusion: Given the ongoing nature of this project, a preliminary analysis points to a unique ability of HFS in demonstrating knowledge gaps and errors in protocol that are significant to patients, families, clinical personnel, and hospital administration. Already, three specific aspects of the protocol that need revision have been identified: 1) timing of death pronouncement after asystole; 2) required elapsed time prior to organ procurement after death; and 3) sequence of time out procedures. There also seems to be a strong indication that such an activity has the ability to improve interdepartmental communication and understanding. Although there is significant evidence of the utility of HFS as a learning tool for clinical personnel, there is less discussion regarding its role in formulating clinical policy and protocol. This HFS based project may ultimately suggest just that.
References
None listed.
Board #435

**Validation of a Visual Aid for Postpartum Hemorrhage Using Multidisciplinary Simulation** (8292)

**Monday, January 12, 2015, 3:30 - 3:42 PM**

**Presenter:** Michael P Hofkamp, M.D.

**Professor:** David Harris

**Objectives:** Postpartum hemorrhage (PPH) remains a rare, but significant cause of peripartum morbidity and mortality in the United States.\(^1\) Protocols have been developed in a checklist format to effectively manage PPH\(^2\) and multidisciplinary simulation has been used to practice PPH scenarios.\(^3\) One of the limitations of checklists is that typically only one or two people are able to view the checklist during an event. We propose using a visual PPH checklist embedded on a bulletin board to manage PPH events. Multidisciplinary simulation will be used to evaluate the effectiveness of the visual checklist.

**Discussion:** A multidisciplinary team consisting of an attending obstetrician, obstetrical resident, attending anesthesiologist, anesthesia resident, circulator nurse and scrub tech will participate in two PPH scenarios. One scenario will use a checklist that is viewed by only one team member while the other scenario will use a visual checklist that includes fields for entry of patient data such as estimated blood loss, urine output, crystalloid, packed red blood cells, etc. that can be viewed by all team members. The team cohorts will be randomized to determine whether the standard checklist or visual checklist is used first. The scenarios will be video recorded and the subjects will fill out a survey after completion of each scenario. We predict that subjects will complete more PPH checklist steps using a visual checklist compared to a standard checklist. We also predict that subjects will rate communication and teamwork higher when using a visual checklist compared to a when using a standard checklist.

**Conclusion:** The results of this study may potentially influence best practices regarding multidisciplinary management of PPH. The next step would be to introduce the visual PPH checklist into direct patient care for further evaluation. This study is pending Institutional Review Board approval but is expected to be exempt from oversight due to its design.

**References**

   Accessed June 4th, 2014
Objectives: Baylor Scott & White Memorial Hospital has long served Bell County, Texas as the regional Level I trauma center. In 2011, a freestanding pediatric hospital opened less than a mile away and quickly obtained Level II pediatric trauma center status. Currently, the majority of pediatric trauma admissions occur at the pediatric trauma center but some patients are occasionally brought by private vehicle to the adult trauma center. Many of these patients can be easily stabilized and transferred to the pediatric hospital but some patients need emergent resuscitation, imaging and surgical intervention. This presents a special challenge for the adult trauma center to maintain competence in managing pediatric trauma in the face of declining admissions. Multidisciplinary pediatric trauma simulation has been shown to improve team performance\(^1\) and has also been used to identify systemic weaknesses.\(^2\) We predict that multidisciplinary pediatric trauma simulation will identify areas for improvement in our institution and maintain competencies. Our study is unique in that our Level I adult trauma center is located in close proximity to a pediatric trauma center but is obligated to treat the rare pediatric trauma patient too unstable for transfer who requires emergent intervention.

Discussion: Multidisciplinary pediatric trauma simulation scenarios will be performed at Baylor Scott & White Memorial Hospital. Team members will consist of an emergency medicine attending physician and resident, a trauma surgery attending physician and resident, an anesthesia attending physician and resident, emergency department nurses and operating room nurses. In the emergency department, the scenarios will challenge the team to make a diagnosis and decide whether or not the patient can be transferred. If surgical intervention is indicated, the operating room staff will be required to provide an appropriate operating room and staff. Intraoperatively, the scenarios will encompass cardiac arrest, massive transfusion protocol and disposition to an intensive care unit. There will be a multidisciplinary briefing upon conclusion of the scenario. A trained observer will document events during the simulation and comments during the debriefing. An anonymous survey will be distributed at the conclusion of the debriefing. Outcomes to be measured include time to diagnosis, time to transfer patient to operating room, time to surgical intervention and evaluation of overall teamwork using a validated instrument.\(^3\)
Conclusion: Multidisciplinary simulation of pediatric trauma in our Level I adult trauma center may reveal system based barriers to care. It may also improve teamwork and communication across the disciplines of providers. Ultimately, it has the potential to decrease morbidity and mortality for pediatric patients presenting to our Level I adult trauma center. This study is pending Institutional Review Board approval but is anticipated to be exempt from oversight due to its design.

References
Board #437
Creation of a Cardiac Anesthesia Simulation Boot Camp for First Time Rotators (10249)
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Michael P Hofkamp, M.D.
Professor: David Harris

Objectives: Anesthesiology residents rotating through their cardiac anesthesia rotations for the first time are task overloaded due to the complexities of caring for a cardiac patient. Simulation has been shown to improve performance with central line placement\(^1\) and arterial line placement.\(^2\) Crisis resource management has been shown to improve teamwork and performance.\(^3\) To our knowledge, there has not been a described simulation course designed specifically to address the needs of learners entering their first cardiac anesthesia rotation. We propose creation of a simulation course that teaches the skills needed to be successful on a cardiac anesthesia rotation.

Discussion: Our simulation course, the cardiac boot camp will encompass training on preparing an anesthetic workstation in a standardized fashion for a cardiac anesthetic, arterial line placement, central line placement, induction of anesthesia in a cardiac patient, insertion of transesophageal echocardiography probe, separation from cardiopulmonary bypass and transport of the critically patient to the intensive care unit. The cardiac boot camp will be given during the first week of the cardiac anesthesia rotation. Outcomes will be evaluated by a survey given to residents and faculty members.

Conclusion: We hope to demonstrate decreased variability in preparation of the anesthetic workstation for cardiac anesthesia, improved self–reported confidence to care for cardiac patients in the residents and improved perception of the residents’ performance by the faculty. Results from this project may influence best practices in graduate medical education for cardiac anesthesia. This study is pending Institutional Review Board approval but we are anticipating it will be exempt from oversight due to its design.

References
Board #438

*Exploration of Virtual Patient Cases and Standard Patient Cases for Interprofessional Education* (8872)

Monday, January 12, 2015, 4:06 - 4:18 PM  
Presenter: Karen Huhn, PT PhD  
Professor: David Harris

**Objectives:** Despite the proposed benefits of interprofessional education (IPE), substantial factors limit the ability of educational programs to incorporate IPE into their curricula.¹ Gardner and coworkers reported workplace structure, geographical separation of campuses and turf issues over professional scope of practice as limiting factors.² A review by The Best Evidence Medical Education (BEME) indicated the necessity for IPE experiences to be authentic and reflect clinical practice to enhance effectiveness.³ Web-based virtual simulations, may be an alternative pedagogy to help educators limit the geographical separation factor while still providing authentic and potentially more frequent IPE experiences. Web-based virtual simulations allow participants to remain on their campuses or at home and still work with students from other disciplines in other buildings or even other campuses potentially decreasing the limitations students being in various locations.

The purpose of this exploratory pilot study was to garner student feedback regarding two delivery methods of interdisciplinary clinical experiences, virtual and live. Two students from each of the Doctor of Physical Therapy, Respiratory Therapy and Physician Assistant programs were recruited to participate in this pilot study.

**Discussion:** Two healthcare teams each consisting of a physical therapy, respiratory therapy and physician assistant student were formed. Team A examined and designed a treatment plan for a patient simulated in a virtual hospital space. Team members were portrayed as avatars and used headsets to talk to each other and the patient who was voiced in real time by a live person. Video clips of a real patient displayed on a screen in the virtual hospital room were used to portray movements such as the patient rolling in bed and walking. Interactive monitors allowed the healthcare team to view vitals while lab reports, cat scans and the patient chart were displayed as pdf documents also displayed on a screen. Team B examined and designed a treatment plan for a patient portrayed live by a trained actor. The actor responded to questions and portrayed pain with movement. Lab values and cat scan images were provided. Upon completion of the first case, the teams then switched delivery methods with Team A completing the live case and Team B the virtual simulation. Subjects completed a pre and post encounter Attitudes Toward Working in Healthcare Teams Survey (ATHCTS) and participated in semi-structured focus groups designed to gather their perceptions of the two delivery methods.
Conclusion: There was little to no change in pre to post ATHCTS for the group as a whole. Students’ attitudes toward working in healthcare teams were high at pre test indicating they valued healthcare teams prior to any IPE experience. Both teams reported feeling disconnected from the patient in the virtual encounter but also admitted to not interacting sufficiently with the patient in either the virtual or live encounters. Faculty observations concur that the teams failed to interact sufficiently with the patient in either virtual or live encounters indicating the delivery method was most likely not the cause of the limited interaction with the patient which may have led to students feeling disconnected from the patient. Each team encountered technical issues with “choppy” audio in the virtual encounter. This was later determined to be caused by software running in the background on some of the computers used. Each team reported feeling comfortable working together by the second encounter whether it was live or virtual. While students generally preferred the live encounter, they also reported seeing the value in using the web-based simulation to enable them to experience a greater frequency of IPE encounters.

References
3. Hammick M, Freeth D, Kippel I, Reeves S, Barr H. A best evidence systematic review of inter professional education. medical Teacher 2007;29;8;735-751
Objectives: Physical and Occupational Therapy educators are required to teach students how to assess, evaluate and modify homes to meet the needs of patients so they may function in their own homes with a disability. As with most clinical skills, learning to assess a home requires practice and exposure to a variety of different styles and types of homes. Constructivists and community of practice based on situated learning theories support the notion that learning should occur in a situation in which the knowledge is to be used, in other words an authentic environment.\(^1\) Class size, travel logistics and intrusion in patient homes are just some of the factors that limit schools’ ability to provide students with exposure to authentic learning environments for home assessment. The second factor limiting student exposure to home assessment skills is the increasing amount of content to be covered in professional education and a decreasing amount of time to cover it in. The purpose of this project was to design a tutorial/simulation with game characteristics that could be a stand alone module for teaching students how to assess a home and at the same time afford them an opportunity to practice with several different types of homes and patient situations.

Discussion: A partnership was formed between a physical therapy faculty member and an E-Learning development company to develop a 3D training simulation in the game development platform Unity 3D. The program was designed to run in most major web browsers and Moodle learning management system. The simulation begins with a tutorial using text, audio and animation to teach the students the basic Universal Design framework and the process of completing a home assessment. Upon completion of the tutorial the user must pass a short quiz on material covered in the tutorial. The tutorial is followed by three lessons of increasing difficulty that are locked by default. The user must pass each level before progressing to the next. Each lesson begins with a description of a patient case. The user then enters a simulation of the patient home in the first person perspective where he/she can freely walk around. Items that are modifiable highlight when moused over. Editable items will display a menu of modification options when clicked on. The user must choose the appropriate items to match the case description and patient goals. Student performance is compared to pre-determined criteria and must achieve a score of 80 or greater to pass the level. Levels can be repeated until passing score is achieved.
Conclusion: Twelve physical therapy students were asked to play the game and participate in focus groups. All reported the game was easy to play, they played more than once, it held their attention and they put effort into the game despite the fact that it was an ungraded experience. Students felt the tutorial was too long but agreed that if they had not all ready been exposed to the content in class then the tutorial was appropriate. Students primary complaint was focused on the mechanism by which they received feedback upon completion of each level. They wanted to know which criteria items they had done correctly before they repeated the level. Two students reported the game levels were too easy and all expressed a desire for more levels with increasing difficulty such as awkwardly shaped rooms, outdoor spaces other then ramps to enter homes and budgetary restraints. Based on student feedback the simulation will be modified to change the degree and type of feedback provided upon level completion. A second version will be created with more challenging cases and homes and budgetary constraints. The intent is that the first iteration will be the tutorial and initial practice levels and the second version will incorporate more higher order decision-making and application of knowledge.

References
**Board #440**

*Successful Use of Crisis Resource Management, a Cognitive Aid, and a Reader During an Episode of Malignant Hyperthermia* (8194)

**Monday, January 12, 2015, 3:30 - 3:42 PM**

**Presenter:** Robert S Isaak, DO

**Professor:** John Lutz

**Objectives:** Caring for patients in the safest manner is a universal goal for healthcare providers. Thought leaders have promoted the principles of Crisis Resource Management (CRM) for over two decades. Interestingly, there has been a recent surge in interest in CRM, as well as cognitive aids. Additionally, the idea of a dedicated reader of cognitive aids during acute events has been shown to improve outcomes in simulated emergencies. What remains unknown is whether the specific combination of a reader, use of a cognitive aid, and expertise in CRM leads to improvement in outcomes in real emergencies. We present a case in which the principles of CRM, use of a cognitive aid, and a dedicated reader were applied simultaneously during the rare life-threatening event of malignant hyperthermia. 1) Upon completion of this activity, participants will understand the principles of Crisis Resource Management and use of cognitive aids for clinical emergencies. 2) Upon completion of this activity, participants should consider the utility of a designated reader during an acute event when using cognitive aids. 3) Upon completion of this activity, participants will see how multiple patient safety principals can be applied simultaneously to achieve high quality clinical outcomes.

**Discussion:** A 47- year old male having surgery for a forearm burn underwent general anesthesia using isoflurane. The surgery lasted thirty minutes. As is common during emergence, the patient developed tachycardia and had mildly elevated ETCO2, attributed to the transition from mechanical-to-spontaneous ventilation. However, both conditions persisted and ultimately worsened. Within ten minutes, the patient displayed extreme hypercarbia (ETCO2 >80), increasing frequency of premature ventricular contractions, and hypoxia by pulse oximetry. When the anesthesiologist instructed the resident to place an arterial line, it was noted that the patient’s arm was rigidly fixed in the pronated position. The team immediately mobilized resources and personnel to initiate treatment for malignant hyperthermia. Three of the anesthesiologists who came to assist were simulation faculty with expertise in CRM. The leader quickly established role clarity and distributed the workload using closed loop communication techniques. A resident was assigned to consult the Malignant Hyperthermia Association of the United States (MHAUS) website cognitive aid and kept the leader apprised of steps performed and still needed. Other CRM principles, such as shared situational awareness and soliciting input were also employed.
Conclusion: The patient described had the unfortunate circumstance of having a malignant hyperthermia crisis. The care team in the operating room that day was very familiar with the principles of CRM, use of cognitive aids, and a dedicated “reader” of the cognitive aid. The diagnosis was made promptly despite the nonspecific presenting signs (modest tachycardia and hypercarbia) due to continual re-evaluation of the clinical situation, seeking alternate explanations for findings that had a plausible cause, and other cognitive self-monitoring strategies. Due to the application of these principles, the patient was given the correct treatment and had the appropriate testing performed in a very efficient manner. As a result, the patient rapidly recovered from this acute life-threatening event. This case is novel in demonstration of simulation and safety innovations in a real case example. No individual is likely to encounter MH frequently enough to achieve expert status. What can be achieved though is expertise in leadership, decision-making strategies, and deployment of the CRM framework. The simultaneous application of CRM skills with a cognitive aid and a dedicated reader enhanced the quality and safety of care given in this rare case.

References
To Admit or Not Admit - That is the Question: Developing Decision-making Skills In Mental Health Through Simulation (10135)

Monday, January 12, 2015, 3:42 - 3:54 PM
Presenter: Zainab Jabur, MD, MPH
Professor: John Lutz

Objectives: Over the last 20 years, around the world, healthcare systems in industrialized countries have reduced the number of acute in-patient psychiatry beds. At the same time, as with other specialties of medicine, there has been an increase in the numbers of patients presenting to Emergency Departments. When assessing a patient in crisis, mental health professionals must balance the potential costs and benefits of several possible courses of action. However, it does not appear that all clinicians use the same process to make these decisions or agree on the decisions which are made. Many different factors contribute to variability in decision making during acute assessments. Some clinical presentations may be managed consistently, but others less so. This course was developed to address subjectivity and bias in practice and to bring clinical practice more in line with evidence based guidelines.

Discussion: The course was developed by senior clinicians with experience in a variety of clinical settings. There was a pilot of five courses. The participants were from a wide range of mental health disciplines. The course simulated six clinical scenarios: three psychiatric cases of increasing difficulty, each followed by one clinical decision pathway which is made by the group. In a simulated environment, participants are asked to take a targeted history and perform a risk assessment. First simulation is the initial evaluation, followed by group debrief and votes on whether to admit to/discharge from hospital. Second simulation is the treatment option voted on by the group. During the scenario and debrief, participants were asked to: 1) Be aware of initial impressions when presented with the clinical case; 2) Make a pre-discussion decision; 3) The debrief discussion is directed around fact gathering and processing of experiences, brainstorming around treatment decisions, exploring pros and cons to potential decisions, including debate model, exploring factors, including biases, affecting decisions and clinical actions; and 4) Make a post discussion decision and reflect on reasons for possible changes in decision.

Conclusion: Observations made: Outcomes on different scenarios vary widely, dependent on the particular group and factors that play a role on the day of the course. There is not inter patient consistency in practice with treatment decisions around symptomology and current risk assessment; decisions appear to be more closely linked to perceptions about patient, i.e. bias. Often, there were large shifts in clinical decisions before discussion to post discussion. Often, task assigned in the simulation is not followed, rather that bias influences the approach taken with the
patients in the scenarios. Participants appear to be making decisions regarding risk and treatment before the interview, although they are not aware of this occurring, trend observed is that treatment decisions are made when the presenting complaint is given. Potential Outcomes: There is a great potential for further development of this course, including more advanced courses geared specifically towards senior clinicians. The course can also be adapted towards other clinical specialties in medicine. Further research into the different aspects of the clinical decision making process that have been highlighted by the course, including risk assessment and bias, are clearly indicated.

References
Board #442

**OMS-II Medical Student vs. Physician Preceptor Evaluation of Clinical Presentation Skills** (9943)

Monday, January 12, 2015, 3:54 - 4:06 PM

Presenter: Jennifer Januchowski, RN

Professor: John Lutz

**Objectives:** There is little research available on the use of an objective self-assessment tool in the first and second years of medical school education. Research in this area could prove valuable to longitudinal study designs in which initial educational methodologies could influence self-directed lifetime learning in the post graduate years. If the foundations of self-regulation and evaluation are emphasized in the first to years of medical school, can these habits influence future behaviors beyond the walls of medical school?

**Discussion:** This project focuses on second year Osteopathic Medical Students. Each student, in a virtual SP encounter, will gather subjective information, objective and diagnostic findings as well as document a complete SOAP note. Following this encounter the student will login to software which activates the recording of the presentation session. The student enters the room where the preceptor is waiting and gives the student five uninterrupted minutes to present their clinical case. Once the student has completed their presentation they leave the room to stop the recording. The student is given the same presentation checklist that the preceptor is grading them from as they immediately access their recorded presentation and grade themselves on their presentation skills.

**Conclusion:** We expect that students will grade comparably to their physician preceptors. We hope that providing students the ability for self-evaluation can influence their behaviors throughout 3rd and 4th year rotations and beyond.

**References**

None listed.
Objectives: Across Alberta healthcare providers report not having adequate skills to act as preceptors and mentors, particularly as it relates to interprofessional (IP) competencies. Knowing that they lack IP knowledge and skills, they are concerned about teaching collaborative practice to new learners. The objective of the Health Workforce Action Plan (HWAP) is to develop interactive and reflective IP learning experiences for preceptors and mentors through simulation-based education to be used for teaching new staff and students.

Discussion: Changes in preceptors’ and mentors’ interprofessional knowledge, attitudes and behavior will be assessed before and after two simulation-based education intervention workshops. The changes to the three competency measures are measured with validated teamwork questionnaires (Teamwork Attitudes Questionnaire,¹ Mayo High Performance Teamwork Scale,² McMaster-Ottawa TOSCE 3) and a specifically developed knowledge test (please see Appendix A for example of research tools and psychometric properties of each measure). Between January and August 2014, the intervention workshops will be rolled out to professionally diverse staff and physicians (n= 75-100) working at medical-surgical units in three zones within Alberta Health Services.

Conclusion: Preliminary findings from the pilot implementation with 21 staff at the Foothills Medical Center trauma Unit 44 at the University of Calgary suggest changes in cognitive awareness around collaborative practice after the simulation based educational intervention t(19) = 2.20, p< 0.05 (Cohen’s D= 0.68). Staff also reported changes in participant attitudes specific to awareness around the importance of team structure, leadership, situational monitoring, mutual support and communication. In conclusion, if successful, the simulation-based education curriculum will be widely disseminated for preceptor and mentor training across Alberta to guide the development of a new provincially wide program of simulation based education and research.

References

Objectives: Patient and Family Education (PFE) is an essential component of Patient and Family Centered Care. PFE enhances self awareness of their health condition, compliance to management, and better outcomes. Traditionally, PFE has consisted of discharge instructions, information handouts and counseling. Simulation has been utilized in healthcare provider training, which has been shown to improve competencies and performance in clinical settings. Therefore, utilizing hands on simulation experience for PFE could improve its effectiveness. There are several opportunities to utilize simulation experiences for PFE; these include care for Gastrostomy Tube (G-Tube), Tracheostomy Tube, Central Line, and management of conditions such as asthma, diabetes, anaphylaxis and seizure disorders. A significant proportion of patients with G-Tubes return to the emergency department (ED) and clinics for G-Tube related concerns that can potentially be self addressed. We plan on developing a simulation based PFE program addressing management of G-Tube related complications, including dislodgement of tube, occlusion and infection of the site.

Discussion: A multidisciplinary team involving GI clinics and the Nemours Institute for Clinical Excellence is planning and developing the G-Tube Care Simulation (GCS) program. The goal of the GCS program is to enable patients and families to properly care for, manage, and troubleshoot G-Tube related issues. Caregivers of patients with G-Tubes presenting to the GI Clinics or ED will be consented and enrolled into the study. Caregivers will be randomized to receive either current standard G-Tube related education or participate in the GCS program. Caregivers enrolled in the GCS program will participate in two training sessions, six months apart during their visits to the GI Clinic. GCS program will include hands on practice and troubleshooting of common G-tube related issues such as dislodgement, occlusion, site care, and recognition of true emergency situations that would require ED or clinic visits. The effectiveness of the GCS program will be evaluated by conducting both formative and summative evaluations. Caregiver’s knowledge base and comfort level will be assessed by an electronic questionnaire. The impact of the GCS program will be assessed by tracking the number of calls/visits to the GI Clinic and ED visits for G-Tube related issues during the subsequent two years.

Conclusion: We anticipate that the participation in the GCS program will result in a 25% fewer ED and GI Clinic visits for G-Tube related issues. This could result in significant cost savings and improved outcomes for patients and families. This
would illustrate the effectiveness of a simulation based PFE program and will provide a reproducible template for other PFE programs directed to enhance self awareness of their health condition, compliance to management, and better outcomes.

References
2. Weighted national estimates from 2011 HCUP Nationwide Emergency Department Sample. Percentage of return visits calculated based on reported dislodgements (V55.1) and complications due to bleeding and drainage from tube (536.49) divided by the number of patients visiting ED who were coded as having a G-tube. Estimates do not include patients returning to ED due to infection (536.41), mechanical complications (536.42) or unspecified complications (536.40), or patients who may have returned directly to their surgeon for post-operative care.
Board #445

*Simulation Education of Communication Skills for Health Professionals in the South Moravian Region* (9485)

Monday, January 12, 2015, 3:30 - 3:42 PM  
Presenter: Svatava Kalna  
Professor: Alice March, PhD, RN, FNP, CNE

**Objectives:** Communication of health professionals with patients and their relatives is becoming the forefront of interest to many health organizations. Inappropriate communication of hospital staff with patients is considered an important problem of the Czech healthcare system and one of the most difficult to deal with. It is recognized that communication is a key aspect of the provided care. Effective communication enables better cooperation, helps to develop positive relationships, and has a significant influence on patients’ outcome. Although the education system provides knowledge and professional experience there is little or no possibility to get an adequate training in communication skills. Sporadic courses on communication can hardly have any impact on one’s ability to communicate effectively. Acquiring good communication habits is mainly a question of practice. In order to cope with the need for a systematic approach to solve the problem described we have decided to start a new project at the St. Anne’s University Hospital in Brno. Building on our earlier experience with simulation training for nursing school students we have prepared a project focused on simulation education of communication skills for health workforce, specifically nurses and non-medical support staff.

**Discussion:** The project is planned for twelve months from June 2014 to May 2015. Overall, 60 nurses and 30 orderlies from five hospitals of the South Moravian Region will participate. The training includes three courses aimed at the basic communication skills, communication with patients and relatives, and the effective patient education. The courses are focused on different themes perceived by chief nursing officers as the most challenging, such as preparation for endoscopic examination, rehabilitation of patients after total endoprosthesis, insulin application, patient education for home healthcare, preventing patient falls, dietary changes after diagnosis and so on. Each course begins with a theoretical part comprising group discussions on the selected theme giving the participants an opportunity to share their experience. The major part of each course is dedicated to simulations. The training is organized in four hour blocks consisting of an introductory session followed by simulated situations and debriefing. The simulations are carried out according to semi-structured scenarios prepared by medical professionals and psychologists experienced in simulation education. Using professional actors as standardized patients has previously been demonstrated as advantageous.
Conclusion: The primary aim of the project is to provide a basis for continuous simulation-based training program for nurses and non-medical healthcare workforce. Such a program is not currently available in the Czech Republic. To this end, we will apply for accreditation of our courses from the Czech Association of Nurses. In the frame of the project we also intend to create a variety of supporting educational materials related to the individual courses. Examples are DVD with good communication practices or patient education sheets. These materials will be available to participating hospitals as well as to other interested healthcare institutions.

During the first run of the program we will carry out an extensive analysis. We plan to evaluate each course with a questionnaire survey in order to make necessary corrections and modifications. It is also our intention to evaluate the influence of the program on improvement of communication skills of all participants. The data thus obtained will serve as a basis for further program innovation. An unquestionable benefit of the program for the healthcare sector is the extension of education possibilities for health workforce and thus improving their competitiveness in the labor market.

References
None listed.
Objectives: In our study we aim to demonstrate the transfer of skills acquired in simulation to the clinical setting in the management of sepsis on a medical ward. Sepsis was chosen for its high mortality and poor outcomes.

Discussion: Ethics approval has been obtained. Fourteen junior doctors based in the Acute Assessment Unit of our tertiary hospital were given an initial lecture on sepsis management, and were all individually video-recorded treating a patient with sepsis in the real environment. Consent was obtained from both clinical staff and patients. Trainees were then randomly allocated into two groups. Group 1 received simulation training in sepsis management and the control group re-attended a further lecture on sepsis. All fourteen participants were again video-recorded treating a patient with sepsis again in the real environment. Currently all the videos are being assessed by two independent, blinded expert assessors and participants are scored against two validated tools (Bundle Six for Sepsis - technical performance and Mini-CEX - for non-technical performance). Statistical analysis will follow to compare the two groups.

Conclusion: We believe that our study is one of the first to capture real-time transfer of skills from a simulation lab to the bedside. We hope that our results will pave the way for further research in this area. Though this study is currently uni-centred, we minimise this problem by designing a sound research protocol and by the use of assessor blinding with regard to the participant group or the timing of the video (whether pre or post intervention).

References
Objectives: Patients with end-stage liver disease comprise a patient population whose only definitive treatment is liver transplantation. Anesthesia for orthotopic liver transplantation (OLT) requires specialized knowledge and skills because of procedure-associated complications and institution-specific equipment and guidelines.\(^1,2\) OLT is a relatively infrequent procedure, with 5913 performed in 2013, compared to an estimated 750,000 laparoscopic cholecystectomies.\(^3,4\) One study found that only 26% of responding institutions provided OLT-associated educational activities, such as a clinical rotation, for their anesthesiology residents.\(^5\) There is a need for additional training in proper anesthetic technique for OLT. One teaching modality potentially well-suited for OLT training is the serious game.

Serious games are interactive, screen-based digital games created for the purpose of imparting knowledge or skills.\(^6\) Compared to traditional teaching methods, serious games are portable, inexpensive to distribute, and adaptable to varied and busy schedules.\(^7\) All of these qualities suggest the serious game may be an effective way of teaching OLT anesthesia. The objective of this study is to develop and validate a serious game designed to teach best practices for the anesthetic management of OLT.

Discussion: This research group is working with an independent graphics designer to create the serious game. The different stages of OLT will provide structure for gameplay; a scoring system will reward sound clinical judgment and management decisions. Figure 1 shows gameplay that simulates the intra-operative assessment phase of OLT. The serious game will be validated by a randomized clinical trial. All PGY-2 and PGY-3 anesthesiology residents at the Mount Sinai Hospital will be invited to participate. Baseline OLT performance and initial attitudes toward the use of serious games will be measured by multiple choice exam and graded OLT simulator scores, as well as a questionnaire. Participants will be randomized to a control group or an intervention group, which will be given online access to traditional teaching materials and the serious game, respectively. At least weekly use will be encouraged. After four months, performance and attitudes will be reassessed using the same methods. The primary endpoint will be change in performance. Secondary endpoints will examine time spent using the two teaching modalities, the association between level of training and in-game performance, and the correlation among in-game, multiple choice exam, and simulator scores.

Conclusion: We anticipate that the results will demonstrate the validity of the serious game as a training modality for the anesthetic management of OLT.
expect the performance of both the control group and the intervention will improve after four months of using their respective learning tools. Participants with access to the serious game may outperform the others due to increased motivation to use their teaching modality as well as the ability to save and resume their progress at any time. Generally, such findings may support the utilization of serious games in training healthcare professionals, a proposition that receives mixed support in the literature. More specifically, validation of the serious game would provide a new and valuable tool for teaching OLT anesthesia, an endeavor that thus far has required resource-intensive courses and expensive manikin or animal models. The questionnaire responses may be analyzed to provide insight into which elements of the serious game were effective. If participants respond favorably to the overall game mechanics, the basic framework of the game may be used to create future serious games for anesthesia training in other high risk patient populations.

References
**Simulation to Evaluate Post-residency Retention of Ability to Perform Cricothyroidotomy in Emergency Medicine** (9588)

Monday, January 12, 2015, 4:06 - 4:18 PM  
Presenter: Jane Kim, MD  
Professor: Alice March, PhD, RN, FNP, CNE

**Objectives:** Cricothyroidotomy is a complex, life-saving method of establishing an airway in a cannot intubate, cannot ventilate patient situation. Graduates of all accredited Emergency Medicine (EM) residencies are required to be able to perform an emergent cricothyroidotomy. However, it has been demonstrated in several studies that over time age-related deterioration occurs in both cognitive functioning and fine motor skills. Given a procedure that is rare and not often performed in the clinical world, we attempted to determine the effect of age and years from residency on the ability to properly perform a cricothyroidotomy.

**Discussion:** A group of emergency medicine residency trained EM attendings spanning several age groups and years from residency will be selected from a level 1 trauma, academic institution. Individually, EM attendings will be asked to perform a cricothyroidotomy on a trauma task trainer. Equipment for several different cricothyroidotomy techniques will be set-up for the EM attending. Performance will be determined by procedure time and a standard checklist score. Correlation of performance against demographic data such as age, years from residency, weekly clinical hours worked, previous continuing medical education in airway management, and previous simulation experience will be performed.

**Conclusion:** Although we would like to think that all EM attendings will properly perform a cricothyroidotomy at any age and at any amount of years from residency, I believe there will be evidence of some degradation of proficiency. Perhaps we will even be able to demonstrate exactly after how many years post-residency this degradation occurs. This would support the need for continuing medical education and the use of simulation to reinforce the procedural knowledge of this rare but life-saving procedure.

**References**

Objectives: Multiple studies have demonstrated the methods on how hi-fidelity and low-fidelity simulations are integrated into medical student wilderness medicine courses. Typically, quantitative measures of effectiveness and enjoyment expressed by medical students have been utilized to evaluate effectiveness of the intervention. A limitation of quantitative measures is that it does not allow instructors to assess common problems or successes of the simulation curriculum. By utilizing the Brookfield’s Critical Incident Questionnaire (CIQ), medical students will focus on specific and concrete events and critically analyze their wilderness medicine simulation experience. Once the CIQ responses are collected, common themes will be identified and we can determine exactly what and how medical students learn during their wilderness medicine simulation.

Discussion: Medical students will participate in two separate and different forty-five minute simulation sessions including debriefing. The scenarios will be regarding two separate wilderness medicine situations such as decompressions illness or anaphylaxis in an austere setting. Participating students will be forced to organize themselves into a medical team, communicate amongst each other, formulate a plan to treat and manage the patient, and ultimately determine the disposition of the patient. At the conclusion of the scenario, both participants and observers will come together to debrief the scenario. For the second scenario, participants and observers will switch roles allowing all students to have a chance to be an active learner. After the end of the workshop, a survey is sent to all learners via an internet survey service. Demographic information such as age, level of training, prior experience in wilderness medicine and prior experience in simulation are collected. In order to evaluate the workshop, medical students will be asked to fill out the CIQ as part of the survey (the survey is attached). Once responses have been collected, common themes will be coded and quantified.

Conclusion: The qualitative analysis of the CIQ responses from the survey will clearly identify common themes regarding which specific events were successful and effective or problematic and confusing. The CIQ responses will finally answer the question of what the medical students enjoy about wilderness medicine simulation. In addition, the survey will also allow us to address any common issues that are confusing, directly address these problems and lead to the improvement of our future sessions. We can only grow from having concrete examples of what clearly works and what doesn’t.
References
Objectives: In this project, we aim to apply simulation-based debriefings methods to clinical practice. Particularly in intense, high-risk medical domains such as anesthesia and surgery improving patient safety is a major concern. The science of teams provides a promising lens for examining work in these high-risk domains. Applying this lens reveals that work is performed by ad-hoc teams which are fluid and dynamic rather than definite and stable.\(^1\) Despite the growing presence of these so-called acute care teams (ACT) in today’s organizations, not much is known of what drives their effectiveness and enables their learning.\(^2\) Current team learning theories do not apply to ACTs because they do not factor in their lack of temporal stability.\(^2\) Due to this temporal instability, learning has to be transitional, that is enable team members to use the team experience from participating in one ACT to improve participating in another ACT.\(^2\) However, there is only limited knowledge on what ACTs do and need to learn. Our objective is to examine how structured debriefings can provide a suitable learning infrastructure. Although widely used in simulation-based trainings (SBT) and studied in the context of simulation,\(^3-11\) debriefings are underutilized and understudied in clinical practice.\(^12-15\)

Discussion: The current project consists of three phases. In phase 1, we use existing debriefing structures for SBT\(^6,11\) and social-constructivist methods\(^11,16\) to design an ACT debriefing tool for clinical practice. It is important to debrief based on a pre-defined structure, because when not well-structured debriefings are at risk to fail due phenomena on the individual and social level such as preference-consistent information sharing or a lack of psychological safety that may inhibit structured information sharing.\(^12\) We compare the effects of the new ACT debriefing tool with the effects of a conventional debriefing method (plus/delta)\(^17\) via SBT applying a pre-post, control group design. In addition, we will perform in-depth analyses of debriefing communications.\(^9\) In phase 2 we conduct semi-structured interviews with some of the participants from phase 1 to examine the subjective perspectives of ACT members during debriefings. To enhance the generalizability of our results over organizational and cultural contexts, we also interview leading debriefing experts.\(^18\) Building on the results of phases 1 and 2, in phase 3 we will examine the effects of the ACT debriefing tool on ACT learning in clinical practice applying a pre-post test design.

Conclusion: In the project we hope to show that though being one of the core elements of SBT, the use of debriefing is not limited to the simulated setting. Debriefings most likely offer multiple learning possibilities for ACTs.
results of the project we expect to learn (a) how learning and performance of ACTs will be effectively enhanced by structured debriefings in clinical practice which could provide a cost-effective and potentially powerful learning infrastructure, (b) how ACT debriefings have to be embedded in organizational learning, set up, and conducted to provide an effective yet feasible and low-threshold learning tool for ACTs, and (c) what healthcare providers need in order to learn and apply debriefing techniques during clinical practice and how faculty development programs can be targeted most usefully.

References
Objectives: An Interprofessional Educational (IPE) pilot brought medical and nursing students together early in their educational program with the aim to develop the knowledge, skills, and attitudes necessary to function as effective members of a healthcare team. The problem driving the need for IPE exists since future physicians and nurses are educated separately, yet healthcare practice is interdisciplinary and requires collaboration and teamwork skills. Working in student interdisciplinary teams involves sharing of expertise and relinquishing some professional autonomy. Assumptions guiding pilot design include: interprofessional collaborative practice is vital to provide safe, high quality patient-centered care; future healthcare providers need exposure to and an understanding of different healthcare disciplines’ distinct bodies of knowledge, expertise, and skill during their learning process; IPE requires moving beyond discipline-specific educational competencies to those competencies of an effective clinical team; and experiential learning with simulation is a useful method for educating future healthcare providers.

Discussion: The Medical College of Wisconsin (MCW) and the Milwaukee School of Engineering - School of Nursing (MSOE/SON) developed and conducted an IPE program. Core pilot team consisted of faculty (three medicine and three nursing), medical educators, and simulation staff. The pilot brought 20 second-year medical students and 20 third-year nursing students together for two separate training sessions. Twenty standardized patients (SP) played geriatric patients and significant others in simulation labs representing outpatient and inpatient environments. Each institution hosted a session in their respective simulation center. Scope of the pilot design included identifying targeted learner level and setting appropriate learning objectives, pre- and post-assessment for readiness for interprofessional learning (RIPLS), and validating scenarios with content experts. Targeted scenario topics focused on joint management of problems of experienced by geriatric clients and their families (e.g. dementia, delirium, polypharmacy, safety issues in the home and acute care settings). Faculty from nursing and medicine jointly led the debriefing.

Conclusion: The pilot evaluated an IPE program that involved coordination of 20 medical, 20 nursing students, 20 SPs, 6 faculty and support staff on two separate days. Student feedback valued the opportunity to collaborate with other disciplines and increased the awareness of another disciplines’ role, responsibility, and knowledge in the clinical setting. In particular, nursing students seemed empowered
by their contributions. Student feedback suggests need for more detailed instructions on flow of simulation activities, clearer upfront expectation of the student role, and increased time for patient interaction. Anxiety experienced during interdisciplinary problem solving was a new experience for both disciplines. The debrief was enriched by the SPs providing suggestions about the team process. Medical and nursing faculty as well as academic administrators valued the learning experience and outcome for their respective learners. In summary, simulation is a valuable asset in IPE. It is labor intensive in regards to preparation. The expense, particularly for the SPs, needs consideration. Scaling the IPE up to a class of 200 medical students and a comparable number of nursing students remains a significant challenge.

References
Objectives: To study the immediate and longterm impact of fixed verse growth mindset feedback in anesthesiology resident performance in a simulated scenario.

Discussion: Much of the research concerning learners’ assumptions about their ability is rooted in Dweck and colleagues’ work on Implicit Person Theory. IPT posits that people fit into one of two groups regarding their perceptions of their own ability: entity theorists and incremental theorists. Entity theorists (also referred to as learners with a fixed mindset) assume that their own and others' abilities are fixed, unchanging, and constant. On the other hand, incremental theorists (also referred to as learners with a growth mindset) view abilities as changeable, malleable, and subject to development. In our study we attempt to show if growth mindset feedback has an immediate influence on the performance of anesthesiology residents in simulated clinical scenarios. 25 pairs of faculty and residents were randomly assigned to a control group or a treatment group. Feedback was given and then performance reviewed and ranked into four groups.

Conclusion: Our conclusions are pending. The study has been conducted, we have recruited 25 pairs of faculty and residents. We are in the process of analyzing the data (video and audio recordings, faculty and resident surveys). Three board certified anesthesiologists are currently coding and ranking the participants. Assuming Cronbach’s alpha yields sufficient reliability among coders, the scores will be averaged to create a mean index for each feedback session. Tabachnik and Fidell’s (2007) kurtosis and skewness significance test methods will be used to ensure the index does not violate assumptions of normality.

References

**Number Needed to Teach: How Should We Describe Educational Impact?**

**Board #453**

**Monday, January 12, 2015, 4:06 - 4:18 PM**

**Presenter:** Keith Littlewood, MD

**Professor:** Laurel Riek, PHD

**Objectives:** A wide variety of educational modalities are used in healthcare education. Examples include traditional lectures, small group sessions, multimedia modules, and immersive simulation environments. Data does exist that compares the efficacy of modalities. Given the enormous resource requirements of some educational techniques, it is incumbent upon healthcare educators to responsibly consider the cost-efficiency of high-resource programs. The hypothesis presented here is that principles of evidence-based clinical practice may provide a model for discussion in evidence-based education (EBE). Evidence-based medicine (EBM) can be thought of as the deliberate inclusion of best current evidence in clinical decision-making. A recent discussion in the EBM community has considered the importance of how best evidence is best presented. A simple hypothetical illustration is a treatment that reduces death from 1.1% to 0.6%. Three ways to describe this treatment’s effect are: 1) A relative risk reduction (RRR) of about 46%; 2) An absolute risk reduction (ARR) of 0.5%; and 3) the number needed to treat (NNT) of 200. Data suggests that both health-care providers and consumers perceive the effectiveness and appropriateness of the treatment.

**Discussion:** In a prior investigation, indexed scores of students undergoing both case-based discussion and high-fidelity simulation experiences in teaching shock had been found to perform better on an oral examination following simulation. For this discussion, a success was arbitrarily set as better than one standard deviation below the class average. Treatment was considered as the educational modality. Simulation, when compared to case-based discussion for septic shock, resulted in a RRR (of failing the examination) of 59%, an ARR of 17%, and a NNT (number needed to teach to avoid one failure) of 6. For cardiogenic shock RRR was 100% (i.e., there were no failures in the simulation group), ARR 26%, and NNT 4.

An anonymous survey was conducted in which nursing and physician educators as well as trainees were presented with the incremental costs of simulation and each of
the outcome values separately. Participants used a 1-4 Likert-type scale ranking their support of simulation over case-based discussion.

**Conclusion:** The results showed similarities to the EBM literature, with RRR giving the highest apparent valuation of simulation. These differences were statistically different in all cases except for RRR and NNTeach in sepsis. We conclude that educators and trainees value the impact of simulation differently when the impact is presented in terms of the absolute risk reduction, relative risk reduction, or number needed to teach for successful performance. We suggest that the nomenclature of EBM may merit consideration in the effort to promote EBE. The advantages are the familiarity of clinicians with such terminology and the tenable analogy between health and education outcomes. The biases demonstrated in EBM and in this survey regarding the presentation of the data support a standardized reporting method, as suggested in the EBM literature.

**References**

(N.B. The described survey was submitted to and exempted by the Social & Behavioral Sciences-IRB: SBS Number 2014008000)
Objectives: Pre- and post-testing of learners is a common and time-honored method used to assess the impact of educational experiences. The simplest methodology is to administer nearly identical tests for this purpose. There are significant theoretical and practical shortcomings to be considered in this approach. The pre-test can, by its content, imply to the learner what is considered by the faculty to be important within the encounter. This can affect the way in which the learner subsequently experiences the educational encounter. Further, if the post-test is temporally distant from the experience, the learner will likely focus at least partly upon the primary points of the pre-test. Another important issue is that the tests must have a particularly wide measurement range from the lowest performing novice before the educational experience to the highest performance thereafter. This means that the pre-test is often a daunting experience because it must contain enough material that is not yet mastered, but that might be reasonably hoped to be understood after the experience.

We wish to describe a new methodology intended to address these issues that we have termed conditionally progressive testing (CPT).

Discussion: CPT is an algorithm of gained or lost scoring opportunities. A preliminary question is scored and determines the pathway to the next question. Entire subsequent questions may be skipped, so that each examinee has a unique pathway. Gaining access to more advanced questions does not guarantee superior scoring, because penalties are assigned to particularly inappropriate answers. The attached illustration of a single question set demonstrates these behaviors. In this example, four responses to the opening question result in simple positive or negative point values. Selecting TEE, however triggers follow up question(s). First, a simple diagnosis is sought based upon a TEE clip. An incorrect answer skips the remaining TEE question and awards negative points. (Points are actually lost because they chose a reasonable technology was chosen, but minimal competency was not demonstrated. This is a considered result, since incorrect interpretation represents a risk to patient safety.) If the diagnosis is made correctly, then points are awarded and the progression is to a management question based upon the correct diagnosis. Choices can again result in positive or negative scoring with the same rationale. The exam now moves onto the next question set.

Conclusion: CPT was utilized as a pre- and post-encounter assessment for 22 anesthesiology residents. These residents were going through a one-week preparation for their cardiac rotation. Analysis of examination results
demonstrated improvement of scores with a paired samples significance of <.0001. Just as importantly, CPT appears to have met the goals of adapting to the examinee’s level of competence, and of not rewarding aggressive responses that could not be substantiated with subsequent performance. Pre-test results showed significantly fewer pathways with advanced monitoring, diagnosis, and intervention. Additionally, when advanced pathways were eventually activated, pre-test scoring was often lower and statistically much lower than in post-test sessions. Construct validity was demonstrated by comparison of pre- and post-encounter results as well as expert performance. We believe that these early results indicate that CPT is an effective pre-test/post-test methodology. It is designed to minimize "complexity fatigue" and cuing in the novice, but to allow full demonstration of expertise by the advanced examinee.

References
Board #455  
**Interdisciplinary Team Disaster Simulation Training** (10157)  
Monday, January 12, 2015, 3:30 - 3:42 PM  
Presenter: Daryl P. Lofaso, M. Ed, RRT  
Professor: Mary Ann Shinnick

**Objectives:** Both natural and man-made disasters can occur in any location and at any time. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requires all hospitals to evaluate disaster planning via drills. Emergency medicine physicians and nurses are usually on the front-line of disaster response team. Emergency Medicine and nursing education typically has only a small amount of focus on disaster topics done in a didactic fashion. Hands-on training in disaster medicine for Emergency Medicine residents and nursing is random depending on which residents and nurses are working on the day of a drill. Our hypothesis: Simulated multi-casualty disaster experience would be an excellent method to train an interdisciplinary team of emergency medicine residents, medical, nursing and physician assistant students in disaster management.

**Discussion:** A disaster simulation session was developed that included seven critically injured trauma patients (five Adults, one child and one infant), each represented on a high-fidelity manikin. The session was designed for Emergency Medicine residents, medical, nursing and physician assistant students with varied prior experience to participate in a disaster medicine drill. The injured patients “presented” in a predetermined sequence over a 20-minute time span. The patients were in four adjacent resuscitation rooms and care was administered by a team representative of our typical resident allotment on any given shift (one senior charge resident, three mid-level residents, three interns, six nursing students, four medical students, one physician assistant student). Our goal was to have the team resources stretched and require the team leader to triage patients. Triage was based on severity of injury, priority use of resources, and disposition of patients appropriately based on need for further care. Post-session debriefing emphasized teamwork and communication, the use of the Hospital Incident Command System, communication with Hospital administration, surge plans, and Mutual Aid agreements between hospitals.

**Conclusion:** We evaluated the residents, medical, nursing and physician assistant students on professionalism, individual patient care, global management of the disaster and teamwork. It was observed that the team leader often divided resources between rooms as initial preparation but was slow to redistribute resources as the session progressed. At times the “charge resident” was prone to get involved in medical management or procedures on individual patients and was hesitant to delegate these activities, hindering overall disaster management. The physicians triaged patients regarding the order care was initiated but often failed to
INNOVATIVE IDEA
WORK IN PROGRESS
ABSTRACTS

triage resources such as CT studies and disposition to OR. The studies were left to be done in a typically time order fashion. The residents did an admirable job of patient care with the resources at hand, but did not consider that there were procedures in place, which could have increased their capabilities. They were slow to or never requested help from hospital administration and/or other hospitals. All residents, medical, nursing, physician students indicated that exposure to a simulated disaster was a valuable educational exercise. The residents expressed that the experience increased confidence in their ability to manage a multiple casualty situation.

References
3. Chauvin SW. System for Teamwork Effectiveness and Patient Safety (STEPS) Module 1 Pre and Post- Training Questionnaires. (2006). Office of Medical Education Research and Services, School of Medicine, Louisiana State University Health Sciences Center, New Orleans. (Available from the author at omerad@lsuhsc.edu.)
**Google Glass as Educational Tool for Direct Laryngoscopy** (9878)

Monday, January 12, 2015, 3:42 - 3:54 PM  
Presenter: Jeffrey Kyle Longnion, MD  
Professor: Mary Ann Shinnick

**Objectives:** Despite emergence of several assistive technologies, direct laryngoscopy for endotracheal intubation remains among the most important fundamental skills needed in the emergency department and critical care settings. Challenges in learning laryngoscopy include obtaining a laryngeal view and uncertainty about maneuvers necessary to optimize that view. Furthermore, because of limited visualization, educators are frequently limited in their ability to provided real-time feedback. Video laryngoscopy has been employed for optimizing laryngeal view, and assisting education, but can be cost prohibitive. 4-7 Google Glass (Google, Mountain View, CA), an emerging wearable technology, has been suggested for several roles within the medical and educational field.1-3 With a built in digital camera in the line of site of the right eye, this tool can be used to both broadcast the perspective of the laryngoscopist and to record the intubation experience so that feedback can be provided off-line. To our knowledge, no studies have addressed the clinical and educational utility of this device in assisting direct laryngoscopy training.

**Discussion:** Using Google Glass and a WiFi-linked tablet device, we will demonstrate the ability to broadcast and record video during intubation. We intend to evaluate 30 novice medical students and resident physicians during their intubation training using the Laerdal 3G High Fidelity manikin. One-half of learners will be randomized to a control group that wears the Google Glass during intubation and has their intubation attempts recorded to determine the best Cormack-Lehane (DL) view obtained. The other half of learners will also use the Google Glass, but their attempts will be broadcast live so that an educator with expertise in intubation can provide real-time feedback to the learner about intubation technique and how to improve the laryngoscopic view. All learners will have the opportunity to review their recorded intubation attempt with their educator. In order to assess the efficacy this novel training device, a pre and post-training 5-point Likert Scale based survey will be completed by all of the learners regarding their experience with the device. We will compare the CL view obtained with and without real-time feedback to determine if the use of the Google Glass can affect meaningful change in the grade of the CL view obtained by the learner.

**Conclusion:** This will serve as a small pilot study with a sample size of 30 participants. We hypothesize, this study will demonstrate a novel educational value of wearable technology such as Google Glass in teaching direct laryngoscopy to novice airway managers.
References
Objectives: To describe to attendees the development of a simulation scenario template in support of the future creation of a scenario database.

Discussion: Initially, a concept of a Simulation Scenario Library originated from: 1) Multiple requests among simulation educators asking if others are willing to share scenarios on listservs and forums of a variety of simulation organizations; 2) Requests between members through networking and emails; 3) The phenomenon exists as other organizations began to develop simulation scenario databases which are single profession or discipline focused; 4) Scenarios are offered through organizations require membership or are offered at an additional cost to the membership fees; 5) Companies sell scenarios for financial profit. In response to the anecdotal feedback a needs assessment was conducted and the results overwhelmingly supported the need for the development of a scenario library. Two task groups were formed to develop the scenario template and the validation process. Working in tandem and using an evidence-based approach, the two groups came to a similar consensus of what should be included in a simulation scenario. The first draft of this template has been developed in a document format and future plans include pilot testing for functionality.

Conclusion: The draft template was developed and is entering pilot testing for functionality. Future plans include applying the validation process to scenarios developed using the template.

References
INNOVATIVE IDEA
WORK IN PROGRESS
ABSTRACTS

Board #458

*Intensive Care Essentials (ICE) Course: Management of Organ Support in the Intensive Care Unit* (9001)
Monday, January 12, 2015, 4:06 - 4:18 PM
Presenter: Dr Katherine Ann MacGloin, MBBChir MA (Cantab) FRCA
Professor: Mary Ann Shinnick

**Objectives:** Artificial homeostasis in the critically ill particular to Intensive Care Medicine (ICM). The learning curve of providing organ support when commencing training is steep, cultivated by experience and exposure. Existing courses focus on acquisition of knowledge and skills, recognition of the unwell patient or non-technical skills. 1-3 There is little provision for the trainee for context-specific application of organ support, or how to troubleshoot the common problems arising once support is in place. It has been demonstrated in other areas that some trainees feel under-prepared when starting on-calls4 and that stress associated with ICM can be detrimental to the mental health and performance of staff.5 Previous studies document the value of simulation in training staff for the management of critically unwell ITU patients,6 allowing learners to prepare for and manage unanticipated events, increasing their confidence. The Intensive Care Essentials (ICE) Course exposes novice trainees to context-specific problems and scenarios in a simulation setting, assisting the acquisition of knowledge necessary to troubleshoot, increasing confidence prior to commencing training placements.

**Discussion:** This course will be directed at novice Intensive Care Medicine trainees from both anaesthetic and medical backgrounds. It comprises a mixture of lectures, tutorials, example clinical scenarios and simulations. Each simulation will be student-focused and dynamic and will be categorized according to forms of organ support (Figure 1). Topics are mapped to the curriculum for the Joint CCM in ICM as per the Faculty of Intensive Care Medicine for the UK7. The objective is to improve familiarity and confidence with managing aspects of and common scenarios within organ support. This will be assessed using three questionnaires. The first two questionnaires address self-assessment of confidence immediately pre- and post-course as well as generic feedback regarding to the candidate’s opinion of the course and its contents. The final questionnaire will be distributed one month after the course is completed. The objective is to improve familiarity and confidence with managing aspects of and common scenarios within organ support. This will be assessed using three questionnaires. The first two questionnaires address self-assessment of confidence immediately pre- and post-course as well as generic feedback regarding to the candidate’s opinion of the course and its contents. The final questionnaire will be distributed one month after the course is completed. The objective of this questionnaire will be to assess whether the candidate felt more confident, having done the course, when actually on-call and whether they were able to apply the teaching to their clinical practice. Subjective in situ improvement
Conclusion: For any trainee commencing their first on-calls, there is trepidation that the knowledge or skill-based required will exceed their own repertoire. Though recognition of life- or limb-threatening emergencies is paramount, most novitiates to ICM are capable of recognizing the critically unwell patient. The challenge is not a lack of theoretical knowledge of broken physiology, or when to provide organ support. It is how to manipulate it once in place and how to cope with the problems arising when a machine is expected to assume a cellular function. By simulating and discussing these problems, we will add to the armory of the trainee who, as of yet, cannot have recourse to a bank of experience. The purported outcomes of the ICE course would be as follows: 1) To increase confidence-rating scales for Novice ICM trainees in organ-support for ICM patients using didactic scenario- and simulation-based training; 2) To demonstrate that this confidence can be carried through to ward-based duties and clinical care, reducing anxiety and improving performance; 3) To provide trainees with experience applicable to their clinical duties.

References
Objectives: To completely prevent patients from coming to harm through the practice of medicine, one would have to stop practicing medicine – this is impossible. Normal Accident Theory (NAT) purports that accidents are inevitable in high-risk and complex organisations as a result of the interdependence of components of a system and the extent to which those interactions are unpredictable. High Reliability Organisations (HRO) do not accept that accidents are inevitable, but processes can anticipate and contain errors. Anticipation pre-empts errors in a system, echoing Hollganel's Safety whereby causes of adverse outcomes are detected and minimized. Containment comprises resilience and deference. Resilience is the degree to which a system adapts and take the strain when stressed, coping with developing errors. This leads to Safety II maximizing the number of things that go well, despite varying conditions.

Davis has demonstrated the role of simulation in Failure Modes Effects Analysis (FMEA) to anticipate errors in a system. We propose using simulation in FMEA to assess the resilience of the system, by testing the capacity to absorb strain and preserve function, using debriefing to assess also the resilience of the individual.

Discussion: Failure Modes Effects Analysis involves assessing risk of injury by identifying potential areas of failure within a system and putting in place methods to prevent them. It involves assessing the expected care provided, what and why something might go wrong and the consequences of failure. We will use FMEA applied to an intervention in the cardiology catheterization suite. Staff involved, comprising nursing staff, doctors, circulating staff and radiographers, will outline the steps, potentials for failure, and resulting risks from failure in the process of angiography. This will involve brainstorming, analysis of previous incidents and recourse to existing policies. A risk matrix will assign priority ratings to potential failures and adverse outcomes. This discussion will be observed by members of the Education and Simulation Faculty. We will simulate the procedure in our simulation center but introduce system failures. The subsequent ability of the team and system to adapt and manage the situation will be assessed. There will follow a debrief which will consider the resilience of the system as evidenced by its ability to cope with change and bounce-back and how individual members felt and how they might improve their own resilience using positive feedback.

Conclusion: HRO share certain characteristics. They have complex interdependence between systems, technology, human factors and situational
factors and failure of the system can lead to devastating consequences. These considerations are echoed in The Helsinki Declaration on Patient Safety,7 which identified human factors, resources and education as areas of focus in the ideal of keeping patients safe. Root cause analysis looks backwards at what went wrong. FMEA looks forward, assessing a system for where the potential points of failure are, minimizing the risk of them happening.

To take this one step further would be to say, if they did happen, how would the system cope and adapt so as to prevent failure from becoming harm. If a system is able to adapt to a failure, its resilience helps to avert serious detrimental consequences. We would anticipate that although FMEA aims to minimize inherent risk in a system, this can be enhanced by seeing how the failures which it aims to reduce are managed in a simulation setting. Exposing the system to strain, and assessing how adaptable it is, and what might be put into place to improve this would promote a positive change in the system’s resilience.

References
1. Tanja Manser. Presentation how do we know how safe we are in our daily practice in the Symposium entitled Improving safety in daily practice at Euroanaesthesia (Sweden) 2014.
**Objectives:** Trauma is the leading cause of death in pediatric patients. Application of Advanced Trauma Life Support (ATLS) by the interprofessional multidisciplinary trauma team must be rapid, methodical and efficient. The ad hoc nature of these teams often leads to disorganization, which may result in breakdowns in patient care. A large percentage of these pediatric trauma patients present to non-trauma/non-pediatric emergency departments where providers may not have a robust familiarity with ATLS. Focusing on pediatric and family practice interns, many of whom go on to practice at non-trauma centers, we developed a trauma curriculum consisting of two sessions with a primary objective to improve the rapid assessment, intervention and transfer of the pediatric trauma patient. Using rapid cycle deliberate practice as a novel approach to trauma simulation, we focus on developing muscle memory in carrying out the primary survey, rapid detection of injuries while preventing fixation errors. The second session focuses on integration of learning during an immersive simulation, focusing on interventions and communication. We intend to show improvement in the multidisciplinary team’s confidence in the systematic approach, rapid assessment and efficient care of the pediatric trauma patient.

**Discussion:** Thirty-three pediatric residents rotate through the emergency department twice during their intern year. During Emergency Medicine (EM) month they attend lectures, a workshop on suturing and LPs as well as two hour long simulation sessions per rotation. Recognizing that there were limitations to the content of the simulation sessions and their ability to retain broad clinical knowledge, the sessions focused on pediatric trauma, a clinical event they have little exposure to, and applied a rapid cycle deliberate practice simulation to build their knowledge base and application of ATLS. Prior to their rotation residents complete a self-assessment of ATLS, pediatric trauma and trauma room knowledge. During the initial simulation session, they receive orientation to the trauma room, team activation and roles, ATLS and participate in a trauma simulation. They also attend a lecture on care of the pediatric trauma patient. During their second session, at the end of their rotation, they participate in an occult trauma simulation. The systematic completion of the primary and secondary survey is observed and the focus of the debriefing reflects on their trauma assessment, intervention and hand-off of the patient. After their rotation they complete a post self-assessment.

**Conclusion:** During their rotation residents experience a low exposure to trauma patients. Pediatric interns self-report a poor understanding of trauma team
activation, defined roles of the team, ATLS and situational awareness of the trauma room. After their rotation, the pediatric interns self-report an increased understanding of situational awareness in the trauma room including trauma activation, roles of team members, systematic approach to assessment and interventions and can provide a framing statement at hand off of care that highlight the concerns related to mechanism of injuries, and provide a summary of their primary and secondary survey. Faculty noted an improvement in the systematic approach to trauma patient and rapid completion of ATLS. During their second rotation faculty will note a retention of trauma knowledge acquired and ability to apply it during different trauma simulations. Focusing on a clinical event that residents have limited hands on exposure to, we were able to improve knowledge base and assessment skills of first year pediatric residents during their EM rotation. The repetitive rapid cycle simulation approach to pediatric trauma builds confidence and muscle memory with the ATLS approach that is observable during their follow up simulation session.

References
Board #461

Rethinking Transfer: How Does Self-regulated Learning Prepare Residents for Future Learning? (9376)
Monday, January 12, 2015, 3:42 - 3:54 PM
Presenter: Julian C Manzone, BKin, MSc(c)
Professor: John Rask

Objectives: Simulation-based training is an established component of medical curricula that has contributed to improved patient care and patient safety. However, existing simulation curricula cannot cover the multitude of problems clinicians will encounter in daily practice. Hence, researchers must understand how trainees adaptively transfer knowledge and skills recently acquired using simulation into subsequent learning in other settings (e.g. clinical contexts); a concept referred to as preparation for future learning (PFL). Researchers define PFL as a trainee’s ability to learn new information from available resources, to relate new learning to past experiences and to exhibit innovation and flexibility in problem solving. Early evidence suggests that trainees in a self-directed learning (SRL) group demonstrate superior PFL outcomes in statistics compared to an instructor-led group. This link between SRL and improved PFL has yet to be studied in medical education, which is a major gap considering that ‘lifelong learning skills’ are listed as core competencies by most medical licensing bodies. We plan to test our hypothesis that an evidence-based SRL intervention will better promote trainees’ PFL than instructor-led practice of endotracheal intubation using simulation.

Discussion: We will randomize novice residents (n=45) into three groups: structured SRL, instructor-led, and an unsupervised control group. All participants will learn four variations of endotracheal intubation. In addition to a pretest, posttest, retention and transfer tests, participants will complete a ‘double’ transfer test involving a second learning session before testing of a new skill. Participants in the structured SRL group will receive a list of goals and SRL-orienting questions, whereas those in the instructor-led group will receive one-on-one guidance and feedback. For 1-hr, participants will practice the two easiest skill variations, with the first and last trial considered the pretest and posttest respectively. Two-weeks later, participants will return for a retention test (of the easy variations) and a Standard transfer test (of a moderate difficulty variation). For the Double Transfer test, participants will: 1) receive learning materials on performing intubations in the presence of clinical variability; and 2) be tested on the most challenging skill variation. We will analyze intubation skill acquisition and retention using a 3 test X 3 group mixed effects analysis of variance (ANOVA), and standard and double transfer performances using two separate mixed effects ANOVAs.

Conclusion: In addition to enhancing our understanding of how best to teach medical trainees to become lifelong learners, our aim is to increase the learning
return (i.e., retention and all forms of transfer) on simulation-based training across the health professions. Indeed, while the proposed study requires that trainees learn independently, we believe that the hypothesized benefits of our SRL group will extend to residents’ practices beyond the simulation centre to the bedside. To our knowledge, the PFL framework has not been capitalized on in simulation literature. Consequently, current simulation assessments likely do not capture how well our trainees prepare themselves to learn, and instead emphasize how well they perform immediately after a learning session. Research has shown that this focus on immediate outcomes can be short-sighted. Our study will serve as one of the first knowledge translation studies that uses the PFL framework to clarify the link between well-designed SRL interventions and long-term learning benefits. We expect our findings will inform the design of healthcare simulation-based training, and also faculty development practices for educators aiming to develop lifelong learners who can adapt their learning flexibly in the ever-changing medical landscape.

References
Board #462

Self-directed Approach to Evaluating Procedural Skills Competency during the First Two Years of Osteopathic Medical Education (8291)
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Christopher H Martin
Professor: John Rask

Objectives: Self-assessment is a mainstay of medical education and lifetime learning. Much of the literature focuses on learners' ability to measure their aptitude in a certain domain based on subjective grading analyses. For example, a learner completes a task, and then self-evaluates their aptitude using terms such as competent, needs improvement, or poor. Historically these results are then compared to their peers or an objective evaluation completed by a subject matter expert and analyzed for the level of agreement. Because of this, self-assessment has come under scrutiny due to the inherent biases contained within self-reflection and self-instruction. This scrutiny is largely due to the subjective design of the grading tools that students use to determine competency towards a certain subject matter. There is little research pertaining to self-assessment of skill aptitude with an objective quantitative grading device. The goal of this research is to develop and evaluate a course format to teach and assess performance competency in the cognitive and psychomotor domains of clinical procedural skills.

Discussion: We developed a validated course model in which students completed a reading assignment, a quiz, attended the lab, and completed a digitally recorded skill demonstration. The student was then instructed to use the checklist in Table 1 and the correct answers in Table 2 to grade their own skill demonstration. There were a total of 154 student evaluations and videos eligible to be included in the random sample. One video was excluded from the study due to technical issues and one video was excluded due to an incomplete student self evaluation. The paired t-test results demonstrated that there was no statistically significant difference between the student’s self evaluation total score of their video and an expert evaluator’s total score of the same video (p = 0.24).

Conclusion: This course format is an effective way for instructors to measure competency in procedural skills at the formative level through self-evaluation using a quantitative and objective grading tool. The lack of a statistical difference between the student’s self evaluation score and the expert evaluator’s score in the cognitive and psychomotor domains of clinical procedural skills lends to the idea that a such a tool is a credible way for instructors to measure formative competency through the student’s eyes. Further study should be conducted to see if other areas of observed
structured medical examination s in the medical education curriculum could employ a methodology of formative self evaluation. The immediate benefit to study participants is a chance to engage in reflective learning and evaluation of their ability to complete a procedural skill in a safe, non-threatening manner. Feedback from these self-evaluations would prove valuable to determine areas in curriculum needing improvement to better the instruction of procedural skills and self-evaluation.

References
1. Corbett EC, Whitcomb ME. The AAMC Project on the Clinical Education of Medical Students. Clinical Skills Education. Available at: https://members.aamc.org/eweb/upload/Clinical%20Skills%20Education.pdf
Objectives: Student nurses in baccalaureate education are expected to experience healthcare delivery across the range of possibilities within community health. However, meaningful learning experiences that reflect the reality of the community nursing experience are limited in scope. Being located in a state hit often by natural disaster, faculty at Louisiana College recognized the need for students to be active in potential disaster situations both as a student and as a qualified nurse. Therefore simulation scenarios were developed in collaboration with the local chapter of the Red Cross in anticipation of students being activated during the next disaster situation. In order for students to be real volunteers during a future disaster it was imperative that they, as a group, became Red Cross volunteers. This entailed them undertaking the introductory modules provided by the Red Cross for volunteers and these were incorporated into the college course for community health nursing. Having completed the introductory courses for Red Cross volunteers, the students were then ready to practice their role within disaster relief through simulation experiences in conjunction with the Red Cross.

Discussion: After Red Cross training, the students participate in simulation experience which they might encounter in a real disaster event in Louisiana. Students also tour Mega Shelter in Alexandria, Louisiana, one of the biggest such shelters in the nation and a location in which students would be expected to work during a disaster. Simulation begins with information on the triaging of patients, after which the students are ready to engage in disaster simulation experiences. The simulation is related to a recent disaster such as a tornado or hurricane. Local participants are recruited to play the parts of the victims. All arrive at the simulation shelter with various medical needs. Students then begin to interview the victims with a Speed Dating format. There are three stations operating at a time and each station is focused on particular public health issues. Students are paired together and six enter the scenario and interview for 10 minutes. At the 10 minute buzzer, the students rotate to the next station and interview again using the Red Cross CMIST tool. Victim characters have come with dogs, children with measles, lost glasses and medications. In the chaos, students prioritize and mange care as they decide which community resources are needed to meet the clients’ needs.

Conclusion: Having completed the introductory courses for Red Cross volunteers, each group of students are recognized as qualified volunteers by the Red Cross and receive a Red Cross volunteer pin during their nursing pinning ceremony at graduation from the nursing program. It is important that all the students in each
cohort are registered as active volunteers with the Red Cross because when a disaster strikes volunteers have to be activated immediately and there is no time to train volunteers who need to be deployed immediately. They begin to understand it’s ok to think outside the box, as one student stated in post-simulation. They also realize they have life skills which are applicable to the situation, such as playing with the distraught child while another student interviews the mother. One client brought her dog, which was very lively, and students decided to develop resources for animal care from within the community. The simulation with live actors help to allay the students’ fears related to communication. The simulation promotes independence, role-development as a nurse, and leadership. The students come away with learning in a fun atmosphere whilst becoming prepared to meet the next disaster that might impact the state of Louisiana.

References
Automated Intelligent Mentoring System to Improve Individualized, Objective Human Performance Feedback during Clinical Procedural Skill Acquisition

Objectives: The importance of deliberate and repetitive practice and feedback are well recognized features of medical simulation which lead to effective learning. To provide adequate opportunity of these key features, learners must have access to appropriate simulation devices, equipment, faculty mentoring, expertise and feedback and individualized time to acquire a designated skill to the defined level of competence or mastery. Though this model is achievable, it comes at a high cost in terms of availability of devices, equipment, faculty expertise and time. In some cases this limits the opportunity for learners to have adequate, individualized opportunity to achieve desired performance outcomes. Further, as clinical demands increase on medical educators, their availability to observe, mentor students and provide meaningful feedback is becoming more difficult, especially at the individualized level. Finally, faculty observations of clinical procedural skills mainly rely on subjective criteria regarding the actual precision of real-time human performance metrics. The objective measurement of these human performance metrics is a missing middle in terms of simulator(s) and faculties’ ability to provide feedback for performance improvement of procedural skills.

Discussion: We have developed an Automated Intelligent Mentoring System (AIMS) focused on the measurement of human performance during endotracheal intubation by direct laryngoscopy. This addresses the need to provide objective performance feedback regarding the physical performance during endotracheal intubation, which cannot be measured by current airway simulators. AIMS leverages off-the-shelf computers and the Microsoft™ Kinect™ motion capture devices, to acquire real-time objective measurement of human performance, compared to a master performance model of expected psychomotor skill. The master performance model was developed by recording the performance of acknowledged expert airway management clinicians and developing an aggregate model, which is mapped against the learner to provide corrective performance assessment, and individualized corrective feedback. The AIMS technology provides comprehensive, real-time interactive instruction including active visual cues, and dynamic feedback to users. The current version of the AIMS intubation model has successfully demonstrated effectiveness on a wide array of airway simulators from a variety of simulator manufacturers.
**Conclusion:** We have successfully developed and tested an alpha prototype of the AIMS technology, which addresses a needed missing middle in providing objective assessment feedback to learners developing procedural skills techniques, or being assessed for skill mastery. Based on our initial findings, the AIMS technology enhances individualized objective human performance measurement, deliberate and repetitive practice, and feedback necessary to accelerate skill acquisition with minimal supervision by faculty; and provides uniformity in training and competency assessments. The next phases of testing and validation will include a randomized control trial comparing the outcomes of the AIMS technology to traditional observational feedback and assessment. Finally, several new clinical procedure applications are in development using the AIMS technology.

**References**
**Objectives:** This study proposes to assess the reliability (accuracy and consistency) and acceptance (perceived value as compared to traditional clinical faculty) of specialized Standardized Patients (SPs) as clinical faculty extenders to teach and assess clinical-procedural skills (e.g. peripheral IVs, ECG placement, simple interrupted suturing). The following outlines the research questions we are studying: Is there a difference between the effectiveness of SPs and traditional clinical faculty in teaching, assessing and providing feedback to medical and health professions students during clinical-procedural skills instruction? What are the learners (students) acceptance of (perceived value as compared to traditional clinical faculty) and perspectives about the effectiveness of SPs as clinical faculty extenders? How does the performance of SPs and clinical faculty teaching clinical procedural skills compare to traditional faculty as determined by individual teaching and assessment performance (adherence to curricular material and assessment metrics), and student performance outcomes and satisfaction? What are the hidden values (e.g. availability, numbers of instructors, costs) of this model, and how does it compare to the traditional clinical faculty teaching model?

**Discussion:** The role and use of Standardized Patients (SPs) to represent normal and abnormal patient presentations for the purposes of teaching and assessing communications and physical examination skills across a wide spectrum of healthcare providers is well established. More recently the role of the SP beyond these representations to include targeted procedural skills training has been explored as the demand for procedural skills training has increased at healthcare training programs across the US. The use of SPs in an expanded role also supports increased deliberate and repetitive practice for learners during early skill acquisition. Finally, the use of SPs to augment clinical faculty presents several significant benefits; they are more readily available, cost effective, and have demonstrated skills in teaching, assessing and providing feedback and debriefing to a wide range of learners.

**Conclusion:** We have conducted two pilots of the study protocol and SP training sessions in preparation for formal implementation. In both pilots the SPs were trained to a standardized curriculum for simple interrupted suturing, as established by clinical faculty subject matter experts, and were required to demonstrate “mastery” level performance for instruction, assessment, and feedback. The SP trainer cohort provided instruction, assessment and performance feedback to a
volunteer group of Nurse Practitioner (NP) students (n=24). These participants received the entire instructional, skills practice, assessment and feedback intervention and completed a brief survey including additional comments and feedback regarding their perception of the experience. Initial results that the NP group were highly satisfied with the ability of the SP cohort to provide instruction, assessment and feedback (see Table 1). Further, the NP participants provided additional comments that support the utility of this instructional model (e.g. very relaxed environment, perfect for the adult learner, I had more comfort learning and making mistakes away from my usual faculty, very helpful, great instruction). Based on these initial results, the use of SPs as Clinical Faculty Extenders seems feasible.

References
Board #466


Monday, January 12, 2015, 3:42 - 3:54 PM  
Presenter: Matthew L. Moorman, MD, FACS, FCCP  
Professor: Kris Slawinski

**Objectives:** In designing this curriculum, the student investigators will: 1) List and describe Kerns’ 6 steps to medical education curriculum development; 2) Become proficient in WHO Universal Patient Safety measures; and 3) Identify basic techniques and limitations of simulation technology. At the conclusion of the training curriculum, the learners will: 1) Describe basic procedures appropriate for 3rd year medical students (ie, Foley, IV, incision, suturing); 2) Name the three components of the World Health Organization Surgical Safety Checklist and correctly describe the timing of their use during a procedure; 3) Identify at least two items which can be used to confirm a patient’s identity; 4) Perform a sign-in (i.e, Huddle) addressing at least patient identity, procedure, site, and equipment.

**Discussion:** Patient safety breakdowns are ubiquitous in the current healthcare environment and result in patient harm. An inordinate amount of resources are wasted trying to change current healthcare provider behavior. Students want to be involved in patient procedures as early as possible. Most are not prepared to do so when their first live patient procedure occurs and are unaware of universal patient safety measures. Current faculty behaviors do not always provide students with the best model to mimic. A better way to change culture is to teach the desired methods early in student’s training and let them see first-hand their benefits and purpose. A program which utilizes high-fidelity simulation to introduce students to the procedure environment can address many of these issues. The events and discussions leading up to the procedure (eg, universal safety checklists) can be accomplished in a threat-free environment. The result of breakdowns in these antecedent events can be demonstrated in a multitude of ways. Basic education principles which are not typically possible with live patients may be applied in simulation. This project is part of the Case Western Reserve University School of Medicine 2014 Interprofessional Scholars Collaboration in Teaching and Learning (iSCTL).

**Conclusion:** This is a Spring/Summer research project for 1st year medical students and their faculty mentors. Student investigators will learn basic research methodology and education principles via their specific project work and weekly didactics. This project will focus on introduction to simulation based medical education curricular design and proficiency with patient safety protocols. The investigator will become a patient safety champion as a result. The final curriculum will introduce students to basic procedures in their pre-clinical years. It will
integrate universal patient safety measures into the mechanics of doing a procedure. The goal is that these soon-to-be physicians will not need to learn safety as an afterthought to patient care activities. Quality and patient safety will be an integral part of the care they provide. Failures in patient safety are tracked in our institution. Student involvement is monitored. The long-term goal is to see a decline in these failures as our target students enter the clinical clerkships.

References
Board #467
*Simulation in Limited Resource Countries: How Can it be Done? (9079)*
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Donna Moro-Sutherland, MD
Professor: Kris Slawinski

**Objectives:** High-fidelity simulation has been shown to be an excellent tool in medical education at all levels of training in industrial countries. In limited-resource countries, high-fidelity simulation is relatively absent. Equipment is expensive and sustainability has not been achieved. Several groups have explored the incorporation of low-fidelity simulation in established educational programs and have shown that it is a valuable and effective tool. The primary goal of this work is to understand how we can support educators to develop sustainable curricula utilizing low-cost simulation techniques that meet learners’ needs in limited-resource countries.

**Discussion:** Part 1: By convening a panel of experts from the US, Canada and Africa, we will construct a guide to aid champions abroad to set up learning models, and sites for simulation education in limited-resource countries. This guide will address the obstacles that need to be overcome and suggest ways to ensure maintenance of the program. Questions that will be addressed include how to develop simulation curricula that is culturally contextualized and sustainable. How can we bring together existing programs and learn from their experience? Finally, how can we increase the number of simulation programs in limited-resource countries? Part 2: Build a warehouse of cases for educators and learners. Each of these cases will include a list of the minimum equipment that is practical to the setting and maintain the credibility of what simulation has accomplished in developed countries. Cases will focus on the care of sepsis/septic shock, malnutrition, pneumonia, gastroenteritis/diarrhea illnesses, malaria, HIV, and injury. The development of low-cost simulation models to teach airway and procedural skills identified for the care of the sick and injured child will be instrumental when developing sustainable curricula.

**Conclusion:** Partnering with experts in simulation and global health to develop a low-cost pediatric simulation curriculum will be monumental. It will be the first of its kind and will be accessible and applicable for educators and learners working in limited-resource countries. The burden of disease in children and the high mortality rate can only be addressed when commitment to care and education are available. Taking information and connecting individuals and organizations will help to promote this work abroad. The mission of PEARs, ETAT and HBB has been to reduce infant, child and maternal mortality in developing countries and each of these programs have made great strides with the backing of large organizations. The sharing of curriculum development and the establishment of a warehouse of
pediatric cases, airway and procedural skills for the care of the sick and injured child will help this educational endeavor cement itself in the teachings of healthcare professionals in the global health arena.

References
INNOVATIVE IDEA
WORK IN PROGRESS
ABSTRACTS

Board #468
Relationship of Cues and Problem Framing in Clinical Reasoning (9792)
Monday, January 12, 2015, 4:06 - 4:18 PM
Presenter: Dr. Kereen R Mullenbach, MBA, PhD
Professor: Kris Slawinski

Objectives: Cognitive errors are an important source of preventable harm to patients. These arise from faulty interpretation, synthesis, and judgment; and lead to suboptimal treatment decisions in patient care (Cook, Erwin, & Triola, 2010; Newman-Toker and Pronovost, 2009). Framing the correct problem is essential to prevent errors. The nurse frames the problem by developing a mental model that provides structure for problem identification. In a patient exhibiting confusion, if the nurse frames the problem as dementia, when the actual problem is hypoxia, subsequent care will not be appropriate and could result in adverse consequences. Accurate framing is contingent upon the skills, knowledge, and experience of the nurse. It is important for nurses to collect and interpret cues to recognize changes in the patient’s condition. Nurses must develop the cognitive skills to practice safely and effectively. These skills include the ability to assess, analyze, infer, explain, evaluate, self-regulate, conclude, and decide. These processes are key to critical thinking which is essential to practice safely (Kaddoura 2013). By learning more about how student nurses frame problems and make decisions, faculty can enhance the curriculum to support clinical reasoning and decision making.

Discussion: This study explores the relationship of cue identification and problem framing in student nurse clinical reasoning. The Think-Aloud (TA) technique was used to collect data. Two scenarios depicting post-op complications were programmed into the High Fidelity Patient Simulator (HFPS). A convenience sample of 20 student nurses participated in the study. Students were asked to think aloud about shift report and to continue TA while assessing the patient to identify the cues, frame the problem, and decide on a diagnosis for each patient. They were asked to identify the most important cues, and if they cared for similar patients in the past. The TA data was audi-taped. Protocol Analysis, developed by Ericsson and Simon (1984), will be used to analyze the data. The three phases of Protocol Analysis are Referring Phrase analysis, Assertional analysis, and Script analysis. The Referring Phrase analysis organizes the identified cues into categories; the Assertional analysis examines the relationships between the categories; and the Script analysis explores the cognitive processes and the possible use of heuristics. The research asks what cues were acquired and interpreted, how the cues were used in problem framing, how they diagnosed the problem, and what heuristics were used.

Conclusion: Student nurses will identify and interpret the cues from the report and from their assessment of the HFPS. The students will use these cues to frame the
problem which will then direct their subsequent actions. They will describe how they linked the cues to form relationships and make assertions. Assertions can be anticipative (planning), declarative (stating facts), evaluative (judging), explanatory (rationale), or inferential (conjecture). The students will categorize the problem as a diagnosis, either nursing or medical. It is expected that students will start to frame the problem at the end of the report based on their domain knowledge. The use of heuristics by students, such as representativeness, may be limited due to their limited clinical experience. These findings can be used to develop simulation scenarios that will give students more exposure and experience in changes in the patient condition. These additional experiences will prepare students to recognize early signs of complications and prevent failure to rescue situations.

References
Board #469

**Validity and Reliability of a Peripheral Intravenous Catheter (PIVC) Insertion Skills Checklist (9007)**

**Monday, January 12, 2015, 4:18 - 4:30 PM**

**Presenter:** Connie Murray, M.Ed, RD

**Professor:** Kris Slawinski

**Objectives:** The peripheral intravenous catheter (PIVC) Insertion Skills Checklist was created and tested to measure PIVC insertion skills during a simulation-based mastery learning course. Most healthcare practitioners learn their skills to insert PIVCs with little formal training even though there is evidence that less proficient insertion of PIVCs can result in increased patient complications, such as infiltration and phlebitis.1-6 There is growing evidence that a more comprehensive, simulation-based mastery learning (SBML) methodology results in improved quality of patient care in other invasive procedures, such as the insertion of central venous catheters.7 8 However, there have been no formal studies to measure the impact of a PIVC SBML course on practitioner PIVC knowledge, procedural skills and the resulting patient outcomes. The Insertion Skills Checklist was created to objectively observe and measure PIVC insertion skills of healthcare practitioners.

**Discussion:** The PIVC Insertion Skills Checklist is a 28-item list, based on the Infusion Nurses Society Standards of Practice (2011).9 The checklist is designed to be used by trained raters to assess clinician competency and skills during a peripheral IV catheter placement. Expert opinion validity was determined by three infusion therapy experts. Hospital clinical educators, at the site of use, reviewed the checklist ensuring alignment with hospital policy and procedure. Raters completed a 3-hour training, which included instruction, practice, and debrief, designed to teach accurate and consistent use of the checklist. All raters were required to observe and complete the skills checklists on three simulated PIVC starts with a minimum correlation of 0.9 to gold-standard results. Inter-rater reliability was determined at multiple time points including initial one or two observations and an additional random observation. Refresher training, with online videos of IV starts, was provided to maintain checklist use proficiency.

**Conclusion:** The PIVC Insertion Skills Checklist is a valid and reliable tool to evaluate and measure clinicians’ PIVC insertion skills. The checklist is practical, requires minimal training to use, and is adaptable to individual healthcare site policies and procedures. Whether in simulated or actual patient care settings, this instrument can be used to measure baseline PIVC insertion skills, identify skills gaps to determine educational needs, and demonstrate PIVC insertion skills improvement over baseline following an educational intervention. The PIVC Insertion Skills Checklist is an instrument that, through its use, can potentially help
to improve peripheral IV catheter insertion education, clinical practice, and ultimately patient outcomes.

References
Board #470

**HPS Liver Transplant Scenario to Assess Crisis Management Skills in Anesthesia Residents** (7970)

**Monday, January 12, 2015, 3:30 - 3:42 PM**

**Presenter:** Dung D Nguyen, MD  
**Professor:** Suzanne Strom, MD

**Objectives:** Liver transplant anesthesia experience is not mandatory for anesthesiology residency programs in the United States. However, many programs expose their residents routinely to these cases in the hope that the exposure will enhance their ability to handle complex cases. Liver transplant surgeries will potentially expose the resident to high volume blood loss, hemodynamic instability, coagulopathy and electrolyte disturbances, especially hyperkalemia. The aim of this study is to assess the ability of anesthesia residents to identify and manage an intraoperative hyperkalemic arrest after reperfusion of orthotopic liver transplant, using a patient simulator (PS) scenario.

**Discussion:** A PS scenario was developed in which the anesthesia resident leads an OR team during reperfusion of an orthotopic liver transplant. Video recording was used for assessment of the crisis management and for constructive debriefing of the residents for formative feedback. Times for administration of Epinephrine (EPI), Calcium Chloride (CaCl) and secondary hyperkalemia treatment [Insulin/Glucose, Sodium Bicarbonate, or Albuterol] were recorded. After a minimum of two hyperkalemia treatments were given, the simulation scenario resumed stable hemodynamics and time was recorded (HD). Data and SD were analyzed using paired t-test. Significance was assumed if \( p < 0.05 \).

Post simulation the residents were debriefed and evaluated the experience using 5 Likart scale questions. Twenty five anesthesia residents in training years PGY 2-3 participated 13 residents had previous liver transplant experience (OLT), 12 residents had not been exposed to liver transplants. (non-OLT).

**Conclusion:** The PS is a useful tool for evaluating anesthesia resident performance during an intraoperative crisis situation related to liver transplant. Previous liver transplant experience increases the anesthesia resident’s ability to recognize and treat hyperkalemic cardiac arrest. Related to faster recognition and intervention, hemodynamic stability is achieved faster by liver transplant trained anesthesia residents. Anesthesia residents rated the experience as very valuable and recommended the simulation experience to other residents. The findings support the value of exposing anesthesia residents to liver transplant surgery. The demonstrated approach may be useful to educators in other institutions, and we are actively looking for collaborations to test our scenario outside of our institution.

**References**
None listed.
Objectives: The enrollment of under-represented groups in research has been identified as a challenge. Barriers include linguistic differences, limited health literacy, history of ethical abuses and mistrust. Addressing these barriers requires close attention to the informed consent process and the training of research assistants. The SCRIIPTT project uses innovative simulation-based interventions to incorporate cultural and linguistic competency into the informed consent training process using the expertise and participation of community members. Our objectives are to: 1) Examine the value of a simulation-based intervention in training research assistants in culturally and linguistically appropriate informed consent; 2) Describe components of the SCRIIPTT simulation-based intervention; and 3) Present preliminary data from the SCRIIPTT pilot study demonstrating proof of concept. Simulation in medical education improves performance in a variety of domains including communication, psychomotor skills and behaviors. Building on this, we hypothesize that the use of simulation-based training for research assistants in culturally and linguistically appropriate informed consent will result in more effective recruitment and retention of participants from groups under-represented in research.

Discussion: SCRIIPTT is a community-academic partnership across four entities: a community organization (Mosaic Cultural Complex); the UMass Center for Health Equity Intervention Research; the CCTS Bioethics Core and IRB; and the UMass Interprofessional Center for Experiential Learning and Simulation. The intervention is a simulated informed consent encounter with a research assistant administering informed consent to an acting research participant, portrayed by a trained community advisor. There are three components: 1) Training of CAs; 2) Four-hour training including review of informed consent, ARP roles, SCRIIPTT rating checklist and scenarios; and 3) Skills building in debriefing and cultural competency. Training for RAs: CAs provided a two-hour training for the RAs including a review of the SCRIIPTT rating checklist and scenarios, with training in culturally appropriate informed consent and awareness of implicit/explicit bias. Simulation: Consisting of three scenarios that portray common informed consent encounters for the recruitment of research participants from under-represented groups. All encounters were videotaped and observed by a CA and UMMS faculty. Each observer used the SCRIIPTT rating checklist. Debriefing was conducted with the RA, ARP, CA and UMMS faculty.
Conclusion: Outcome measures were satisfaction surveys for RAs and CAs, and the SCRIIPTTT rating checklist to measure culturally appropriate informed consent in the simulation encounter. CAs expressed positive experiences, including being an ARP and participating in the simulation debriefing as a CA observer. Several stated more time was needed for the CA training, specifically time to rehearse the RA training. All three RA volunteers were female, 20 to 30 years old, college educated and represented three different racial/ethnic backgrounds. Each reported receiving less than 10 hours of formal training and all worked for at least two years within the medical school and hospital. None of the RAs had experienced simulation-based training. RAs reported that the intervention positively changed the way they implemented the informed consent process. All found the training, stimulation, and feedback from CAs and ARPs helpful. The end product was a prototype intervention. We are completing the data analysis. We anticipate that long-term results will increase engagement by communities of color in research and in simulation-based cultural competency training. As stated by one of the CAs, ‘This can move the needle on the generational distrust that exists within my community in regards to research’.

References
Board #472

**U-Sim: A Collaborative Online Scenario Builder Application** (9906)

Monday, January 12, 2015, 3:54 - 4:06 PM

Presenter: Daniel Noji, BS
Professor: Suzanne Strom, MD

**Objectives:** Scenario development can be a tedious and lengthy process. For busy clinicians who are content experts but may not have formal training to develop simulation cases systematically according to educational principles, variations in scenario standardization may affect quality and learning outcomes. A standard process is needed to ensure that key components of learning are included. However, scenario template documents created to assist in this process are often cumbersome to complete and difficult to maintain. To streamline this process, we developed U-Sim, an open and collaborative scenario builder web application free for community use. The application guides the scenario author in completing critical educational data components, while its framework breaks down the scenario into component parts and stores them in a relational database model. The application then generates a standardized scenario schema that offers limitless opportunities. Scenario data can be used to generate easy-to-read scenario guides for instructors, simulation operations specialists, scenario actors and learners. Further, the scenario may be exported in widely used formats (e.g. XML) and used at other centers or in third party applications including screen-based simulations.

**Discussion:** Scenario authors complete several data components: metadata (case synopsis, diagnosis, duration), patient (history, physical exam, lab/imaging, etc.), environment (clinical setting, actors, set-up logistics), education (learning objectives, debriefing questions, curricular integration, assessment), and events (learner actions and effects). U-Sim allows for the development of a library of scenario elements including learning objectives, patient information, labs, imaging, equipment, and even learner actions with scenario-agnostic effects. Users can both contribute and incorporate elements from this library, eliminating redundant aspects of scenario development and allowing users to focus on creating rich scenario environments. Scenario events are broken down on the back end into patient states, learner actions, and environment objects, which are all stored into a database model. When developing a scenario, the user may define various states as changes in a patient’s status from default values. The scenario advances when learners perform actions triggering new states or when timed states are activated. Learner actions in turn reference a variety of defined objects (i.e. medications, orders, procedures, etc.) and the availability of each may be tied to a specified state.

**Conclusion:** Our application is focused around the power of collaboration, both within the user’s simulation center and around the global healthcare simulation community. Collaborators from the same or different institution can independently
develop pieces of a scenario in the application, and pull from a library of scenario elements to simplify the process. In an effort to encourage simulation scenario sharing, we are opening up our application for free use by the simulation community. This will allow us to create an open library of well-developed simulation scenarios and will consequently help in developing a standardized scenario format and ease the process of running scenarios across different simulation centers. Our application’s open, structured, and yet flexible format gives learners the opportunity to experience developed scenarios in a simulation lab or on a screen-based simulation application.

References
Due to the innovative nature of this application, no references were found. Various commercial virtual simulation products may have their own proprietary case authoring tools (e.g. DxR Clinician, Laerdal Scenario Editor), but features are not intuitive, comprehensive or adequate for educators and simulation specialists to easily use.
Board #473  
*Validation of a Model of Diagnosis using Virtual Patient Simulation* (7770)  
Monday, January 12, 2015, 4:06 - 4:18 PM  
Presenter: Daniel Nystrom, MS  
Professor: Suzanne Strom, MD

**Objectives:** A model of diagnosis resulting from a work domain analysis (WDA) on the medical diagnosticians’ work domain1 represents a unique perspective. Such an inquiry serves as a holistic account of the diagnostic process; describing where information is collected from resources available to clinicians (e.g.: electronic health records, physical exam, medical literature, etc.) and how this information influences clinicians’ arrival at a particular diagnosis. However, this model has yet to be validated. To validate the WDA model of diagnosis, a realistically complex online simulation scenario will be constructed to assess the model's capability of describing differences among expert and novice decision strategies, time spent making diagnoses, and error rate of diagnosis.

**Discussion:** DecisionSimTM, a commercially available online simulation software product2, will provide the platform for the development, distribution, and collection of participant responses to diagnostic case scenarios. This simulation tool allows an author to construct branching narratives that guide participants through simulated clinical decisions. Since diagnostic expertise is often tied to a particular domain3, a complex case involving a patient with an aortic dissection will be built to induce differences among novice and expert physicians. During the simulation, participants will be provided with a description of the research goals and background information to set the scene before entering a sources of information node. At this point, participants will be able to access different sources of information commonly available to them while making a diagnosis (e.g.: vital signs, physical examination, imaging labs etc.). The sources of information available to participants were identified by the previously mentioned WDA1 and provide a crucial element towards the validation of this model of diagnosis (see Figure 1). After sampling information from the different sources of information, participants will record their diagnosis and treatment plan.

**Conclusion:** Due to technological and methodological constraints, previous techniques investigating the cognitive features of diagnosis were forced to use relatively small samples of diagnostic cases and participants4. Developing on online diagnostic simulation scenario provides an opportunity to reach more participants for a more thorough validation of diagnostic models. It is anticipated the rigor incorporated in the development of the current online simulation scenario and the ease of access to participants will provide a robust foundation for the validation of the WDA model of diagnosis.
References
INNOVATIVE IDEA
WORK IN PROGRESS
ABSTRACTS

Board #474
Evaluation of Prioritization Skills in Neonatology Fellowship Trainees (8392)
Monday, January 12, 2015, 4:18 - 4:30 PM
Presenter: Carol Lynn O’Dea, MD
Professor: Suzanne Strom, MD

Objectives: The skill of clinical prioritization is vital to successfully manage multiple complex patients in the neonatal intensive care unit (NICU). Neonatology trainees begin fellowship with varying levels of autonomy and exposure to critically ill patients and procedures due to work hour restrictions as mandated by the ACGME. Additionally, the decision-making skills of trainees vary and there is no clear and consistent method of teaching or measuring these skills. To date, there are limited studies investigating prioritization in the literature and it is currently unknown if prioritization skills of trainees improve with clinical experience. The primary objective of this study is to investigate if prioritization skills differ in neonatology fellowship trainees at different levels of training as compared to academic attending neonatologists. The secondary objective is to investigate whether prioritization skills of neonatology trainees differ when tested in a time-unlimited setting versus a time-limited setting. We hypothesize that the prioritization skills of neonatology trainees will not be at the same level of the “expert” attending neonatologists and that these skills with improve with clinical experience.

Discussion: Six eight-item surveys of common NICU scenarios were developed. Twenty academic neonologists (experts) determined the prioritization order of the scenarios via a Delphi method. Two surveys were emailed to neonatology fellowship trainees nationally. Surveys were divided into priority tertiles based on “expert” rank. The rankings of the 1st-tertile scenarios were summed. Scores ranged from 6 (expert) to 21. Mean scores analyzed by 2-sided t-test and ANOVA assessed differences in prioritization between training year and the “experts.” Variances in correct rank-ordering of the 1st-tertile scenarios by training year were determined by chi-square tests. A significant increase in the mean scores of fellowship trainees compared to “expert” rankings exists; evidence that trainees are less likely to identify the 1st-tertile scenarios in a time-unlimited setting. A multi-patient simulation was created from a 3rd survey to simulate a NICU “on-call.” Participants complete a post-simulation survey to prioritize the scenarios based on acuity. Fellows receive a score of their ranking of the 1st-tertile scenarios in the simulation and post-simulation survey. This part of the study testing prioritization in a time-limited setting will complete by July 2014. Conclusion: Differences in prioritization exist between neonatology fellowship trainees at all training levels and “experts” in a time-unlimited setting, shown by the survey data. This supports our hypothesis that the ability to prioritize varies between neonatology trainees and attending neonatologists. There was no difference found between years of
fellowship. This may be evidence that in a time-unlimited setting when participants can carefully consider each scenario any differences between year of training are minimized. To further investigate prioritization skills between trainees and “experts” in a time-limited setting, a multi-patient simulation study is in progress. In a time-limited setting where it is necessary to assess patients quickly and efficiently, differences in prioritization between levels of training may be more evident. Data collection will complete by July 2014 with data analysis completion expected by October 2014. Based on results of this study our next goal will be to assess the feasibility of designing multi-scenario simulations for inclusion in a simulation curriculum for neonatology fellowship trainees. These exercises could assess the prioritization skills trainees enter fellowship with and to teach prioritization to trainees whose skills need to improve.

References
INNOVATIVE IDEA WORK IN PROGRESS ABSTRACTS

Board #475

**Trainees Survey: Using Simulation in Genito-urinary Medicine to Enhance Induction Program** (9310)

Monday, January 12, 2015, 3:30 - 3:42 PM
Presenter: Dr. Rasha MIA Omer, MBBS MRCP
Professor: Lennox Huang, MD, FAAP

**Objectives:** Clinical simulation has long been recommended as a tool for training in Medicine. Unfortunately in areas such as Genito-Urinary Medicine (GUM), this tool is rarely utilized. Most of the new trainees have little or no experience in GUM. The current practice is for the trainees to undergo a period of induction for about two weeks prior to starting their post. They shadow senior colleagues to gain some experience before being allowed to conduct consultations independently. We conducted a survey amongst junior trainees in GUM who are currently in post or have previously worked in the department of GUM in the Royal Hallamshire Hospital, part of The Sheffield Teaching Hospitals NHS foundation Trust. The aim was to find out their views on the current induction program and to assess whether simulation training would have been of value in their preparation for the post. Our objectives were to find out: 1) The level of trainees prior experience in Genito-Urinary Medicine; 2) About trainees previous experience in Simulation training; 3) About their views and opinions on the usefulness of the addition to clinical procedures and simulated scenarios to enhance the induction program.

**Discussion:** Twenty-six trainees were invited to complete an online survey. Most were in a four to six month rotation as part of their training in the Foundation, Core Medical or General Practice Training programs. 23 trainees completed the survey (88%). Trainees were asked to rate the induction program on a 5 point scale ranging from very good to poor.

Data was collected on the level of training at the start of their rotation and previous experience in: GUM or related specialities; Clinical Simulation; genital examination and skills in the use of speculum and proctoscope. Using a 5 point rating scale from extremely helpful to not at all helpful, trainees were asked on their opinions with regards to usefulness of including workshops on genital anatomy, interpretation of microscopy slides, speculum and proctoscope use, and samples collection. Trainees were also asked to rate the usefulness of adding commonly presenting clinical cases, using the 5 point rating scale as above, such as sexual assault, giving positive results/Breaking bad news, genital viral infection counselling, chronic pelvic pain syndrome, pelvic inflammatory disease, recurrent NSU, and STI screening for under scale ranging from extremely helpful to not at all helpful.

**Conclusion:** The majority of the trainees (57%) had little or no prior experience in the field of GUM. 43% had some experience in working in related fields such as obstetrics and Gynaecology and Urology. 66% rated the induction program as good.
35% though it was average. No one gave a poor rating, however only 1% thought it was very good. 78% (n=18) of trainees had previous experience in Simulation in acute medical while 22% (n=5) have had no previous experience (Most of the trainees who have been through simulated training seem to have found the experience helpful. 74% (n=17) reported no experience in using the proctoscope. 87% agreed that workshops on proctoscopy and sampling techniques would be extremely helpful. 83-96% agree that adding simulated clinical scenarios would be “extremely Helpful” in their preparation for the post. Although most trainees are somewhat satisfied with the current induction program, the majority agree that they would have felt more confident if they had hands-on experience with certain procedures and simulated clinical scenarios. We recommend the inclusion of simulated training to enhance the current induction program in the form of: 1) Workshops on practical procedures; and 2) Simulated clinical scenarios in an outpatient GUM setting.

References
Board #476

**Best Practices: Teaching Interprofessional Learners to Use the IMIST-AMBO Patient Handoff Tool (9038)**

Monday, January 12, 2015, 3:42 - 3:54 PM

Presenter: Judy Ortiz

Professor: Lennox Huang, MD, FAAP

**Objectives:** Project Objectives: 1) Analyze the components of the IMIST-AMBO patient handoff tool for effective patient handoffs; 2) Compare and contrast the instructional methods and simulation model needed to support the interprofessional patient handoff education; 3) Consider the benefits and challenges of the partner project for the institutions, providers, and students; and 4) Identify opportunities for other organizations to participate in future research studies using the IMIST-AMBO patient handoff tool.

**Discussion:** A randomized experimental design with matching was used to examine whether the instructional mode of team training has an impact on overall team performance during patient handoffs. PA students were distributed to the three instructional groups in the study: didactic lectures (Group A), simulation with paramedic students (Group B), or no intervention (Group C). All PA students participated in the traditional PA emergency medicine curriculum which included a 20-minute overview of the IMIST-AMBO patient handoff tool. In addition to the traditional PA curriculum, Group A received two supplemental didactic lectures about crisis communication and patient handoffs; and Group B practiced two additional simulated patient handoffs to paramedic students. Following the educational sessions, all instructional groups participated in a post-test simulation which included a 30-minute scripted medical scenario with a patient handoff to paramedic students. The simulation was followed by a 20-minute debriefing session.

**Conclusion:** Team performance of the three instructional mode groups during the post-test simulated patient handoffs will be measured by the IMIST-AMBO patient handoff tool. The groups will be compared using analysis of variance. The validity, reliability, and internal consistency of the IMIST-AMBO patient handoff tool will also be examined. It is hypothesized that students who participated in additional simulation training (active learning) will perform better than students who participated in didactic lectures (passive learning). Program curriculum and teaching methods will be changed and improved as a result of this study. Future research will focus on the development of competency-based assessments for healthcare providers. In addition, the investigators would like to invite other institutions and professional organizations to collaborate in future research studies using the IMIST-AMBO patient handoff tool.
References
Board #477
Scenario Design Modification after Alpha- and Beta-testing: Identifying Pitfalls for Novice Educators (10217)
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Gen Ouchi
Professor: Lennox Huang, MD, FAAP

Objectives:

Discussion:

Conclusion:

References
Objectives: The objective of this pilot study was to develop and pilot test a cost effective distance learning system for simulation based education using the commercial internet for multipurpose simulation based training. Simulation based education (SBE) is expanding globally as an evidence based effective clinical sector education tool for procedural skills, communication strategies, clinical decision making, and teamwork. Technology based tools are complex and require educator skill training, unique facilities, equipment, time, and funding. Educator skill development is a major identified barrier for SBE, particularly at early stages of program development, as are funding and access to training centers for remote hospitals. Japanese medical schools increasingly have simulation centers with internet, and VPN connectivity. Local and university hospitals are interconnected and exchange clinical data, and routinely conduct internet based case conferences. Our goal is to provide simulation based education access for local healthcare providers by modifying an existing system. This project aims to identify technical feasibility and usability of a low cost internet based simulation training system for feasible daily simulation distance training.

Discussion: We conducted distance SBME between the University of Hawaii (UH) and Akita University (AU), Japan. Akita University is the only facility of 77 hospitals in Akita prefecture with high fidelity simulators. A fellowship trained UH facilitator controlled a manikin at AU, and facilitated hospital nurse (n=5) cardiac case training: 1) Normal sinus rhythm; 2) Stable atrial fibrillation; 3) Pulseless VT. Objectives were; 1) initiating monitoring, oxygen, and IV access; 2) assessing vital signs; and 3) calling for help. Sites connected by commercial internet. Applications: Laerdal SimMan3G, TeamViewer (TeamViewer Inc., USA), and VTC (H.323) protocol. Usability heuristic and technology feasibility surveys followed the SBME sessions. Technical feasibility: We demonstrated real-time SBME with integrated remote control of a simulator via the commercial internet. Learner and educator surveys showed high video quality satisfaction, acceptable latency, and borderline audio quality. Improvement focus includes echo cancellation, and microphone placement. No additional costs were required, existing systems and free remote control software were used. SBME mean feasibility score for future use was 4.2 on a 5 point Likert scale, learners (n=3), Facilitator (n=1), Faculty observers (n=3).

Conclusion: Our success of this pilot test can bring us to next steps. This system has potential application in multi-site faculty training, clinical consultation, healthcare
promotion, and for disaster and emergency crisis management communication connecting with center hospital (university hospital) and remote hospitals. Our previous research shows the novice simulation instructor demand their mentor or supervisor. We can give them debriefing or advices with observing them in real training setting. Furthermore test will improve the system, especially optimizing microphone and developing video camera control system. Another advantage of this system, extra cost does not necessary to establish this system. They have already telecommunication environment including VTC system to connect to university hospital and intra net which can access to external internet system. Our next step is: 1) optimizing audio system and video system for large group team training; 2) testing multisite training; 3) developing stabilizing and consistency of system for simulation based evaluation; and 4) comparing educational effectiveness of distance training with face-to-face training.

References
None listed.
Board #479

EMODs (Electronic Learning Modules): Can Online Modules Improve Emergency Medicine Knowledge and Procedural Skills? (8676)

Monday, January 12, 2015, 4:06 - 4:18 PM
Presenter: Randi Ozaki
Professor: Lennox Huang, MD, FAAP

Objectives: This project was designed to: 1) Design and implement online learning modules based on high-yield emergency medicine topics; 2) Use simulation to evaluate the effectiveness of EMODs as compared to traditional lectures to increase learners knowledge, clinical skills, and procedural skills; and 3) Evaluate the learner's assessment of the efficacy of EMODs as a learning tool.

Discussion: To meet the evolving educational needs of residents, asynchronous learning has grown to include web-based tools that allow for independent learning. While some studies have found that learners are more satisfied with these learning tools, other studies have found that there are no proven increases in their effectiveness. The current project seeks to study the efficacy of an asynchronous learning paradigm using simulation and through the creation of EMODs designed to teach high-yield emergency medicine topics. This is a prospective cohort study designed to evaluate knowledge as defined by improved post-test scores and post-simulation performance. Study participants included emergency medicine interns and pediatric emergency medicine fellows. Participants were randomized to an intervention or control group. Control group participants were given lectures while the intervention group used the EMOD. All participants took a pre- and post-test and performed a pre- and- post-intervention simulation exercise. The simulation sessions were scored using a previously validated checklist for each topic. We hypothesized that through the usage of EMODs, learners will have increased knowledge, clinical skills and procedural skills.

Conclusion: If our study shows that the EMODs combined with simulation exercises can be used as an effective learning tool, the potential impact on future residency curriculum could be substantial. A combined simulation/online system like the EMODs could become an important supplement to residents education as there is a clear need for effective and validated asynchronous learning program for emergency medicine residents.

References
Board #480

**Wechat Platform to Distribute Simulation Education Contents: China Experiences using the Social Network-based Pedagogical Application** (8724)
Monday, January 12, 2015, 4:18 - 4:30 PM
Presenter: Mr. Ruijun PAN
Professor: Lennox Huang, MD, FAAP

**Objectives:** Microblog is a Web 2.0 technology that provides an online social networking platform for communicating and sharing information among web users. In China, Weibo is an extremely popular Twitter-like microblogging site which provide timely information distribution channel. Wechat is an emerging micro messaging service specially designed for mobile device (smart phone, tablet) with bilateral multimedia communication platform. Weibo and Wechat can both effectively enhance pedagogy in additional traditional face-to-face or online medical education environment for the new generation of learners grown up with mobile technology. The aims of this study are to evaluate the feasibility and effectiveness of the Wechat application as a pedagogical method especially for the courses of simulation based training, and compares its learner adoption with Weibo.

**Discussion:** After setting up our group official account, we distributed simulation and medical education multimedia information with two classification four category between Aug 2013- May 2014 to our medical students/residents. During 23 Dec 2013 to 14 Feb 2014, we posted the same information on both WeChat and Weibo simultaneously with various time and weekdays in order to investigate the best time to post information on those platforms. We collected and reviewed the reading quantity and transmitted quantity from the system log. Our WeChat account gained 5,399 followers continuously and distributed 268 pieces of information related to medical education and simulation. It reached total 739,694 read and 67,001 transmitted of all the information (Via Table 4&Fig 1,2). No significant difference was observed in terms of post time, weekday and category I&II(Via Table 5&6) while medical education associated information was widely spread (Via Table 7). When compare between Wechat and Weibo, the overall read quantity and that of medicine knowledge formation were larger in Wechat while activity notice & self-improvement information was widely spread through Weibo.(Via Table 1). No significant difference was observed in terms of release time and date.(Via Table 2 &3)

**Conclusion:** Using Wechat is feasible platform as a pedagogical platform and is well-adopted by our learners. The users may benefit from Wechat freely through the fragmentation time both in workdays or holidays. We plan to launch multimedia courses (e.g., surgical training courses, EKG and radiology) on Wechat platform as a supplement to the time constrain of traditional classroom teaching. We are looking forward to distribute simulation based medical education using Wechat as a MOOC.
(massive open online course) platform to engage more learners in China. For further more, according to WWDC 2014 information, iMessage and iOS 8 may have the familial fonction as Wechat. We also hope to create a new system with the combination of iOS and Wechat.

References
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Board #481

**Novel Approach to Conducting a Residency Needs Analysis: Examining Simulation Debriefings** (9194)

Monday, January 12, 2015, 3:30 - 3:42 PM

Presenter: Dimitrios Papanagnou, MD, MPH

Professor: Rana Latif, MD

**Objectives:** Needs assessments are replete in patient safety and clinical quality. Needs assessments have permeated educational curricula, allowing educators to make informed programmatic decisions. Interestingly, there have been unique applications for needs assessments in residency curricula. To improve the quality and the robustness of the educational curricula in graduate training programs, surveys are typically employed to capture information needed to prompt necessary changes (i.e., securing additional protected time for residents; incorporating resident wellness programs; encouraging more faculty mentoring; facilitating educational scholarship for trainees). Most recently, in an effort to address the core competency of medical knowledge for the ACGME, the Society for Academic Emergency Medicine (SAEM) conducted a needs assessment to assess medical knowledge in emergency medicine resident trainees. Unfortunately, there is a flaw in the survey design for needs assessments: residents may either feel uncomfortable reporting their opinions, or the instrument may not be adequately designed to capture the true meaning of a specific phenomenon. The current study introduces a novel methodology to conduct needs analyses in emergency residency programs via simulations and debriefings.

**Discussion:** Debriefings offer a plethora of information, giving insight into the affective, cognitive, and kinesthetic domains of learning. Debriefings have the potential to offer insight into residency issues that may inform programmatic areas within the curriculum. Our residency program is a PGY-1,2,3 program. Simulations are held weekly; 3-4 residents rotate per session. Simulations are run by a faculty member from the department. Content for scenarios corresponds to the curriculum for the respective month. Scenarios last for <10 minutes; debriefings usually last for 30 minutes. This is repeated twice. Simulations and debriefings will be audio-recorded. Debriefings are to proceed in typical fashion, incorporating an affective phase, a summary phase, an advocacy/inquiry phase, and learners’ take-home points. Research associates were hired to transcribe recordings. Content is to be qualitatively analyzed into thematic categories, Attention will be paid to: education, policies, staff, students, patients, conference, consultants, leadership. Themes outside these categories are also to be recorded. A research associate has been hired to assist with data analysis. IRB approval for the study was obtained. Confidentiality is to be assured to residents at all times.
Conclusion: An immense amount of information is elicited during the debriefings that follow medical simulations. At times, this information may even be data residents may be too hesitant to raise as issues (i.e., challenges with departmental policies, interprofessional communication issues, curricular deficits). The current investigators propose a different means to conduct a needs analysis which may have the potential to identify areas for improvement within the training program. This may have the potential to introduce a new methodology to address the needs for residents enrolled in post-graduate training programs.

References
Board #482

Improving Resident Hand-offs in the ED: A Patient Safety Initiative Combining Checklists, Deliberate Practice, and Simulation (9656)

Monday, January 12, 2015, 3:42 - 3:54 PM
Presenter: Dimitrios Papanagnou, MD, MPH
Professor: Rana Latif, MD

Objectives: Emergency Department (ED) providers are expected to communicate effectively with their patients, their consultants, and the interdisciplinary team that comprises the milieu of the ED. The ACGME emphasizes effective communication as one of its core competencies for residency training. It is expected that residents exemplify effective communication strategies, particularly during instances of patient admissions, discharges, or transfers. Unfortunately, however, the ACGME has reported that patient hand-offs pose risks for patients (i.e., loss of patient information). There is no standardized tool in place to assist ED residents in their discourse with other services, especially when endorsing a patient to an admitting service or to a consultant during a sign-out. Hypothesis: implementing a standardized checklist at the time of ED admissions, consultations, and sign-outs will improve patient safety. To that effect, this represents a [pilot] patient-safety initiative. Through deliberate practice, a checklist will be incorporated into our residents’ management in the ED, and impact communication skills. Weekly practice will improve retention of these skills; improve the quality of communicated information; and decrease risks to patients at the juncture of patient hand-offs.

Discussion: ED residents (PGY-1, 2, 3) will be enrolled in this interventional simulation curriculum. Baseline performance with hand-offs will be assessed for 2 months preceded the intervention. Research associates will transcribe simulations and debriefings; transcriptions of hand-off discussions will be qualitatively coded into thematic categories and evaluated. Intervention: The PACT Protocol (Priority, Admissions, Changes Task), a validated tool (Tapia, 2013) will be discussed, implemented, and practiced during resident simulations. Assessment: 1) 2 months after the intervention, investigators will follow residents that have undergone simulation training with the hand-off tool, and determine how they are applying strategies in the ED; 2) retention of content will be assessed in the simulation laboratory at 2, 12, and 36 months after the initial simulation; reinforcement of the Protocol will be addressed during debriefings; and 3) residents will be surveyed at 1, 12, and 36 months to gauge behavioral changes and related to the Kirkpatrick model.

Conclusion: We propose integrating a checklist to facilitate hand-offs in patient care. The proposed investigation will leverage weekly didactic simulations to assist in training resident physicians on the use of the checklist. The goals of the intervention are to improve patient safety during [potentially dangerous]
transitions of care, and to improve communication between the ED and consultant/admitting services. Future plans will evaluate capturing elements of team work and communication in the ED. Specific plans include using the TeamSTEPPS Performance Observation Tool (TPOT) to evaluate how residents are communicating with peers and other services during patient hand-offs. Data will be compared to pre-intervention, baseline performance for respective TPOT indices, which has already been recorded in our ED.

References
Iterative Redesign and Task Persistence: Optimizing Virtual Patient Simulations for Patient Safety (8427)
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Douglas E Paull
Professor: Rana Latif, MD

Objectives: On-line virtual patient simulation (VPS) has been utilized effectively in medical education. As healthcare simulation educators complete a scenario to address a particular patient safety challenge, there is at times the pressure to move on to the next issue and scenario, sometimes before the first project is fully optimized. We advocate for design methods with a long history of use in software development. This study reviews several themes or planning chunks from one team’s journey in transforming an earlier version of a VPS to teach time-outs prior to invasive procedures outside the operating room to a new and hopefully better version. The reward is in seeing the development of a library of simulation scenarios of high quality and proven value in teaching principles of patient safety.

Discussion: Derived from learner and expert feedback, we developed the following planning chunks in revisiting and revising Version 3.0: 1) Match learning objectives to decision nodes in simulation scenario; 2) Add/enhance interruptions and distractions as challenges to performance of important patient safety behavior; 3) Allow simulation to play out following wrong decision to reveal consequences of decisions and behaviors; 4) Establish roles of characters in the scenario clearly and early; 5) Embed feedback from learner into the on-line experience and make it easy to access learning resources to assist remediation; and 6) Improve simulation logistics including ease of navigation, simplified scoring, and better visuals. The node map for Version 3.0 and 4.3, the latter reflecting the improvements, are shown in Figure 1. Version 3.0 is on the left, and Version 4.3 is on the right. Notice the five purple decision nodes, learning objectives, for Version 4.3 including: diagnostic tests, differential diagnosis, performing a time-out when challenged, reviewing medical images, and visualization of the site mark. In addition, one can now see several wrong pathways (red) leading to an actual adverse event as well as a close call pathway (yellow).

Conclusion: VPS is an effective tool for patient safety education. We encourage the healthcare simulation educators to critically review old scenarios prior to moving on to other safety problems. A checklist of improvements, or planning chunks, can guide the refinement of such simulation scenarios, making them even more effective. The chunking of tasks makes the iterative and evolutionary changes much less formidable and reveals inherent rewards while the redesign is underway. Further studies will compare survey and observational learning outcomes from
version 3.0 and 4.3 to see if simulation design improvements correlate with better learning.

References
Objectives: Create separation amongst candidates to enable the department to select those who fit best with the goals of the department and those of the institution. Using simulation to assess skills of new respiratory therapy candidate, we may find individuals who are technically sound, hard-working, naturally curious, compassionate, and have the ability to think outside the box.

Discussion: These simulations not only assess candidate ability in the technical areas but also assess problem solving and communication. The value is that it provides a more accurate concept of the job they are applying for and also helps the employer make the best choice. The value of this simulation is that it provides a more accurate concept of the job they are applying for and also helps the employer make the best choice.

Conclusion: Ability to assess an individual’s thinking, reasoning, and verbal skills. Advantages have been demonstrated to produce valid inferences regarding ability to perform the job. Can reduce business costs by identifying individuals for hiring, promotion or training who possess the needed skills and abilities. Are less likely to differ in results by gender and race than other types of tests (depends on particular skills being assessed). May be more accepted by test takers due to the obvious link between the test and the job. Less likely to be influenced by test taker attempts to impression manage or fake responses. Can be used to provide specific developmental feedback. Can provide test takers with a realistic preview of the job and the organization. Disadvantages: Does not assess aptitude to perform more complex tasks that may be encountered on the job. May not assess the ability to learn new tasks quickly. Often not conducive to group administration. May require some level of job knowledge and therefore may be inappropriate for jobs where knowledge may be obtained via a short training period. May be difficult to keep updated. May be expensive to administer. May be time consuming to develop and to administer.

References
None listed.
Board #485

**Building a Simulation Center** (8886)
Monday, January 12, 2015, 4:18 - 4:30 PM
Presenter: Holly L Pugh
Professor: Rana Latif, MD

**Objectives:** To facilitate the development of quality simulation programs, our research will compile information on commonalities that were addressed in the development of simulation centers across a variety of practice settings and that support best practices for a simulation program. The specific objectives of this project are: 1) Identify common components of simulation centers located in a variety of practice settings; 2) Compare and contrast characteristics of simulation centers located in a variety of practice settings; and 3) Identify gaps that can impact a simulation center’s ability to meet its strategic objectives and/or SSH accreditation standards.

**Discussion:** Anecdotally, most simulation centers come into existence to accommodate a newly purchased high-fidelity manikin that was acquired through external (not budgeted) funding. One corner of an existing lab or a converted storage space, classroom, or office area becomes the simulation lab or center. As simulation is incorporated into curriculum design and begins to be accepted as a clinical experience, the need for a dedicated and planned simulation facility becomes a necessity. Lacking the knowledge or experience required to design a simulation center, nurses will search for guidance in publications and simulation organizations. A review of the literature has revealed few resources to assist in the planning of a simulation center as a new facility or re-purposing of an existing location.

**Conclusion:** It is generally accepted that simulation has become a vital component in current nursing education programs. Simulation centers will need to be operationalized to provide this methodology. As centers are developed, criteria required for accreditation should be incorporated. These are the core standards and best practices for simulation in healthcare education. The International Nursing Association for Clinical Simulation in Learning (INACSL) has published standards for simulation and the Society for Simulation in Healthcare (SSH) has published criteria for Accreditation of Simulation Programs. A survey is being developed to capture this information and inform the development of a guide to best practices in building a simulation center.

**References**
6. Elizabeth H. Lazzara, PhD; Lauren E. Benishek; Aaron S. Dietz, MA; Eduardo Salas, PhD; David J. Adriansen, EdD, NREMT entitled Eight Critical Factors in Creating and Implementing a Successful Simulation Program, Joint Commission Journal on Quality and Patient Safety, January 2014 Vol 40 No 1, pg 21-29.
Board #486  
Virtual Standardized Patient: Is It An Effective Modality For Educating Pre-clinical Medical Student Presentation Skills? A Comparative Item Analysis of Live Versus Virtual (9932)  
Monday, January 12, 2015, 3:30 - 3:42 PM  
Presenter: Frederic A Rawlins, DO FACOEP  
Professor: William McGaghie, PhD

Objectives: The purpose of the clinical presentation is to provide healthcare providers with patient information. This information provides the basis for transfer of care, specialty consults, and admissions. The clinical setting varies and may range from an emergent bedside presentation to the complete history and physical required in a new patient ambulatory setting. Despite the advent of sophisticated EMRs it remains a skill set that is a keystone to effective coordination of clinical care. Mastery of the clinical presentation translates to effective care and patient safety.

Discussion: A preclinical model for education of medical student for clinical presentations utilizes the standardized patient model. This model is effective for students to acquire history and physical exam findings with the goal of formulating a differential and plan. Following this patient encounter the student presents to a clinical preceptor. There are many obstacles in implementing this model at a preclinical level. Time constraints within preclinical curriculum for both students and clinicians pose a major obstacle. The physical findings for a live standardize patient are limited based on today’s technology. The hiring and training of standardized patients is both costly and fraught with performance variables. VCOM has modeled a virtual standardized patient module utilizing an interactive learning management system. The advantages for implementation of virtual standardized patient at the preclinical level include greater physical exam fidelity, exposure to numerous presentation settings, wide array of cases covering multiple organ systems and significant reduction of expense to the medical college. The research goal is to perform comparative item analysis of presentation skills between the live standardized patient and the virtual standardized patient.

Conclusion: 1) Second year medical students acquiring their patient information from an virtual standardized patient modules demonstrate equal performance in medical presentations as those students who attained patient utilizing the live standardized patient model; 2) Student satisfaction score based on survey data prefer the virtual standardize patient model over the live standardized patient model; and 3) Clinician preceptor inter-rater variability score will have a small standard deviation among the virtual versus the live standardized patient model.

References
Objectives: Mindfulness, as described in the field of psychology, refers to moment-to-moment personal awareness of thoughts, feelings, bodily sensations, and environment, and the ability to focus on and accept the present environment without judgment. It is clear that the simulation-based education requires a certain suspension of disbelief among participants, i.e. treating a manikin as if it were a real patient and engaging in a simulated environment as if it were the real one. Mindfulness is a quality that can be measured, and validated scales exist to quantify it. This study’s intent is to prospectively measure mindfulness in a cohort of participants undergoing a simulated exercise and to determine if a mindfulness quotient, or MQ, is relevant to a) their performance in the simulated exercise and b) their experience within and opinions of the simulated environment as illustrated by an exit questionnaire.

Discussion: Study participants will be drawn from residents, physicians and nurse anesthetists at our institution who are scheduled to undergo simulated exercises as part of a hospital-wide safety initiative. Prior to the day of their simulated exercise, each participant will complete two validated questionnaires designed to measure their personal emotional awareness and the effect that emotions tend to have on their opinions and actions and will be granted a numerical mindfulness quotient based on their responses. During the exercises, an experienced simulation instructor who is blinded to the responses given on the pre-simulation questionnaires will give each participant a simple rated score describing performance in the simulated environment and willingness to participate in the simulated exercise. Upon completion of the simulated exercises, each participant will complete an exit questionnaire regarding their subjective experience in the simulated exercise and their current opinions of simulation as an educational and assessment tool. In-exercise ratings and post-exercise questionnaire responses will be linked to each participant’s MQ for statistical analysis.

Conclusion: Through this study we hope to determine if emotional intelligence is a quality that can be measured and used to predict amenability to and performance in a simulated environment. Ultimately we hope to be able to tailor educational interventions to subjects with differing levels of emotional awareness in order to maximize their ability to benefit from simulation-based education.

References


**Board #488**  
**Result of Integrated Clinical Simulation Teaching Method in the Development of Medical Education Pattern** (9208)  
Monday, January 12, 2015, 3:54 - 4:06 PM  
Presenter: Ting Shi  
Professor: William McGaghie, PhD

**Objectives:** The diagnosis and treatment of patients are not just the diagnosis and treatment of the disease, but also those of natural persons and of a society as a whole; Reasonable education of medical students provides not only the basic medical knowledge or some clinical skills, but also the cultivation of integrated medical practice and thinking-response ability. Medical students apparently require clinical teaching methods with different features before and after the internship, current domestic teaching methods continue to adopt the way of respective guidance by each department of the hospital and intensive training before examination by clinical medical faculty, which inevitably lead to the disadvantages such as repetition of training content, different training standards and lack of team collaboration and humanity education, which even influences students’ future medical work. To this end, our team implements drills of skill simulations and training with a “medical-social-cultural-psychological” integrated pattern based on the characteristics and needs of students in different stages.

**Discussion:** We have set a progressive and integrated clinical simulation teaching system with three stages by adopting a group of superior young teachers, aiming at students’ characters of different stages and their actual working needs, based on team’s early research result. Students of different stages can enter voluntarily for courses, but all the applicants need to pass a pre-evaluation containing the basic skills, subjective expects, course needs and etc. Students will be distributed to an adaptable course phase according to the result of pre-evaluation. After the courses, there will be a post-evaluation containing theory level, practice skills, feedback of learning experience and satisfaction of the courses. Furthermore, the cultivation of the essential personality and EQ capability for future doctors, such as team collaboration and communication, medical humanity spirit and etc., is also the key content of this discussion. The feasibility and recognition of this teach pattern has been confirmed in early teaching practice, we will normalize the criteria and accumulate related experience in late stages.

**Conclusion:** Based on this discussion of teaching practice, we will optimize and integrate the current clinical practice courses and establish a clinical simulation teaching system in accord with current situation and needs of medical students of different stages, and also promote the perfection of cultivation system itself and the development of teaching perception. We are expecting to upgrade the medical
education from skill training to a person's overall training, so as to provide a reference to build a localized clinical simulation teaching system.

References
None listed.
**Board #489**

**Custom Graphic User Interface in Electronic Medical Records to Reduce Medical Errors: A Computer-based Simulation Study (9396)**

Monday, January 12, 2015, 4:06 - 4:18 PM  
Presenter: Richard Shin, MD  
Professor: William McGaghie, PhD

**Objectives:** We are comparing two different electronic medical record systems in a simulated scenario to see if utilizing one documentation system will prevent documentation errors, failure to document critical actions that may have been performed or if one system is prone to more errors. One EMR will be the institutions’ standard EMR which is QuadraMed®, this will be compared to another system which has an interface which allows customizable graphic user interface(CGUI).

**Discussion:** We will study at least 20 senior emergency medicine(EM) trained residents with at least two years of training. They will be using computer based cases that will be presented to them from a mid-level provider or junior resident who will be given a script that will have all the information available for a specific case. The senior EM resident will document the case and order the necessary tests, studies and medications in order to successfully manage the computer based simulated case. They will be presented five cases which will be presented in succession and will manage the patients from the computer with updates from the mid-level provider or junior residents as scripted. All participants will be studied using the current EMR program at the facility of which they have experience and this will be compared with an EMR with CGUI which allows for the residents to set their individual graphic user interface to include windows which display data regarding patient management. These include Nursing Triage Note, Laboratory Values, Imaging including chest x-rays and computed tomography scans, ECGs, patient’s vitals, patient’s past medical history and medications.

**Conclusion:** This study can help demonstrate if a CGUI will help prevent documented medical errors over a GUI which is not customizable. In the future as we become more heavily reliant on computers to help organize our information and help us manage our patients this can be an important tool to help us improve patient safety.

**References**

1. Landman, A. Et Al. Using a medical simulation center as an electronic health record usability laboratory. J AM Med Inform Assoc 2013:0:1-6
Objectives: Currently the recommended number of FAST exams that should be evaluated for competency is 25 exams. There has been no validation study to suggest that 25 exams demonstrates any clinical significance. In order to be credentialed in proficiency in FAST exams, 25 exam are reviewed by a trained ultrasonographer and feedback is given to the performer of the exam. With the use of high fidelity simulation we are now able to perform testing to evaluate competency of performers of the FAST exam. Often performance of this exam is critical to determine significant hemorrhage in blunt trauma patients and abnormal exams are often unable to be reviewed due to inability to provide abnormal exams. With the ability to simulate abnormal exams with high fidelity simulation we can now use it for evaluative purposes. We would like to validate the current standard of performance of 25 FAST exams needed for a practitioner to be certified to perform FAST exams. We also would like to test if the current model requires any changes which include proficiency at a few number of exams or if more evaluated exams are required to achieve proficiency.

Discussion: The department of Emergency Medicine at SUNY Downstate will study approximately 200 medical students who will have no previous history of performance of FAST exams. They will be trained using patients or a high fidelity simulator from Blue Phantom FAST model. All students will undergo a lecture style format which will include a didactic session including lecture and a practical which will include training on human volunteers and abnormal training on the Blue Phantom FAST trainer. We will be using the low frequency probe on a SonoSite M-Turbo Ultrasound machines. These students will then be recruited and they will be randomized into three arms. First arm will train on only 10 FAST exams (8 normal and 2 abnormal). Second arm will train and perform 25 FAST exams (20 normal and 5 abnormal). Third arm will train and perform 40 FAST exams (32 normal and 8 abnormal). Students that participate in the study will be brought back approximately 6 months after completion of training for a practicum which will include 10 exams on the Blue Phantom FAST trainer. They will be rated on their competency. 100% competency is required for adequate competency in FAST exam.

Conclusion: Training necessary for adequate performance of FAST exams should undergo a validation process and we may be able to determine if our current requirement of performance of 25 exams is an adequate number to become proficient. With the use of high fidelity simulation and simulated abnormal exams
we will be able to safely test the retention of skills and necessary retraining time frame.

References
**Board #491**  
*Endotracheal Intubation for Occasional and Infrequent Intubators: How Often Do We Need to Retrain? (9703)*  
Monday, January 12, 2015, 3:30 - 3:42 PM  
Presenter: Richard Shin, MD  
Professor: Ivette Motola, MD, MPH, FACEP

**Objectives:** There is no formalized re-training requirements for the management of emergent airways. The preservation of this skill is essential for the emergency medicine physicians and also for emergency medical personnel. Emergency medicine healthcare providers are occasional to infrequent intubators. There is no formalized training or re-training program for these providers. We would like to perform a randomized controlled trial involving low-fidelity manikins and high-fidelity human simulators to observe training and retraining to successfully perform endotracheal intubation. We are evaluating individuals with minimal training in intubation and see how they will perform in a high fidelity simulated case requiring intubation with different retraining intervals for endotracheal intubation.

**Discussion:** There will be approximately 144 medical students who have been recruited during a standard session involving 1st year medical students who are utilizing low fidelity simulation to reinforce their knowledge for basic head and neck anatomy. They will be taught the basics of intubation and their times and metrics will be recorded. These include pre-intubation preparation, successful placement of endotracheal tube, time to intubation, complications including main stem intubation, number of attempts. These students will then be randomized into three arms: Arm 1) Will be re-evaluated every 6 months; Arm 2) Will be re-evaluated every year; and Arm 3) Will be not be re-evaluated. During their required emergency medicine clerkship block in their third year of medical school they will be tested by performing emergent endotracheal intubation in a simulated case using a high fidelity simulator. A power calculation performed requires 144 participants in order to achieve a significant result. We will use the Fisher exact test and the Chi squared test to evaluate the data.

**Conclusion:** Since the preservation of advanced airway techniques are integral for training of emergency medicine healthcare providers, this baseline research can help determine what the need is for retraining for occasional and infrequent intubators. It can also help determine at what intervals does knowledge and motor skills decline.

**References**
Objectives: The UK National Patient Safety Agency (NPSA) has defined clinical handover as a process where there is ‘the transfer of professional responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis’. The increase in shift-working as a result of the European Working Time Directive (EWTD) has increased the number of handovers taking place and thus elevated the need for the quality of handover to be improved and regulated. Failure in handover is a major preventable cause of patient harm and is principally due to human factors of poor communication and systemic error. The aim of this study is to evaluate the impact on quality of handover by pediatric trainee following simulated teaching on SBAR method of handing over patient care. Primary outcome measures of this study is, a change in effectiveness of handover to the clinical team in pediatric department as demonstrated by the scoring done by experience clinicians based on the SBAR handover tool. Secondary outcome measures of this study: a change in the self-reported confidence level of doctors in handing over patients to colleagues and consultants.

Discussion: Level one pediatric, foundation year two and general practice trainee doctors based in the departments of pediatrics at three different NHS trusts will be invited to participate in the study. Ethics approval as well as research and development approval has been obtained from all the hospital sites where this study will be conducted. Informed consent will be obtained from all participants. Each participant will be audio recorded while performing a handover of a patient to their team in the clinical workplace. A half day teaching session, incorporating the use of SBAR tool using a simulation scenario, will be arranged for trainees to attend in their respective hospital based simulation centres. A second audio recording will then be obtained of the participant performing another patient handover in the clinical workplace four weeks after the teaching. All the audio recordings (pre and post simulation course) will be anonymised and will be individually reviewed by two ‘blinded’ consultant pediatricians who will mark the recordings on a standard marking sheet to evaluate effective use of the SBAR tool.

Conclusion: Evidence supports the use of standardised communication tools like SBAR can help reduce these errors. Lack of adequate training in this increasingly important aspect of patient care is very common. As of 2005 only 8% of U.S. medical schools were formally teaching regarding handover. SBAR teaching is
incorporated in the form of handouts/prompts and small group teaching during induction of junior doctors at new places of work. In view of this trainees will act their own controls in this study. In this study we are hoping to show an improvement from 50% pre intervention-score to 100% post-score. The method of analysis used will be McNemar's test of equality of paired proportions with a 0.050 two-sided significance level.

References
1. National Patient Safety Agency (NPSA), Seven steps to patient safety (London, 2004)
2. The Royal College of Surgeons of England (RCSENG), Safe Handover, (London, March 2007)
3. The Royal College of Physicians (RCP), Acute Care Toolkit 1 : Handover (London, May 2011)
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INNOVATIVE IDEA
WORK IN PROGRESS
ABSTRACTS

Board #493
Role-play Scenarios in Virtual Learning Environments (9185)
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Rebecca J Sisk, PhD, RN, CNE
Professor: Ivette Motola, MD, MPH, FACEP

Objectives: Participants will: 1) Design role-play scenarios to be used in virtual learning environments; 2) Apply the Simulation to Practice Pathway model when developing role-play scenarios for instruction in virtual learning environments; 3) Apply evidence-based teaching practice when designing role-play scenarios in virtual learning environments; 4) Design quantitative evaluation methods to measure student learning in role-play scenarios in virtual learning environments; 5) Design qualitative methods to evaluate role-play scenarios in virtual learning environments.

Discussion: The purpose of this course is to describe an evaluation of the use of role-play scenarios in a virtual practicum preparing online nursing educator graduate students for their future roles. Finding brick-and-mortar practicums is challenging in some localities, so a virtual experience has been designed in Second Life as an option for innovative learning in a flexible format. Three-dimensional virtual worlds are ideal for constructive and collaborative learning.\(^1\) Thus, this practicum is designed to help students collaborate with each other in an immersive experience that mimics the real world. Students design, deliver, and evaluate instruction, similar to traditional practice teaching activities. They also role-play and debrief on several scenarios in which they are asked to handle issues related to student behavior and learning. Examples of these scenarios include the challenges of orienting new staff, dealing with cultural diversity, dealing with lateral violence, handling medication errors by students, and grading clinical experiences. A plan for evaluation has been designed and is being tested over a six-month period to determine the effectiveness of this Second Life experience.

Conclusion: Students are required to devote 100 hours within eight weeks to the nursing education practicum. The practicum experience includes role-play as well as weekly meetings with the faculty mentor and peers, presentations on various topics, a journal club, explorations of the private islands used in the practicum, and time spent developing a course project. Following the Simulation to Practice model,\(^3\) students prepare for the role-play by completing a pretest on the topic being role-played; reviewing readings, videos, and handouts; assuming the personas of characters in the scenario with their avatars; reflecting upon the role-play as it unfolds’ participating in debriefing at the end of the role-play; and completing a post-test. The debriefing consists of students collaborating on how they would handle the role-play situation, as well as a discussion in which students evaluate the role-play itself. A scenario covering methods to handle lateral violence or bullying in
healthcare settings will be tested in the role-play research. Role-play sessions will be videotaped and a content analysis will be used to analyze the debriefing sessions for six months. A model for evaluating role-play scenarios in virtual worlds will be developed based on the results.

References
**Objectives:** Chest pain is the second most common emergency department (ED) symptom.1 ST elevation myocardial infarction (STEMI) represents a true emergency in patients with chest pain; delays in diagnosis increase morbidity and mortality.2-4 Guidelines recommend chest pain patients have a screening electrocardiogram (ECG) performed and interpreted for STEMI within 10 minutes of arrival.5 Studies evaluating accuracy in ECG interpretation for STEMI show significant variability6-8 with up to 10% false negative9 and 36% false positive10 rates. Many factors contribute to ECG misinterpretation, including difficulty of ECG pattern11 and provider experience12,13 However, no study has explored the effect of the interrupted environment on accuracy of ECG interpretation. Interruptions are common in the ED and occur up to 50 times per hour.14 Interruptions cause stress and anxiety,15 and can inhibit working memory, leading to task errors.16,17 While many professions strive to remove interruptions, in the ED, the interrupting task is often critical to patient care. Screening ECG’s represent a critical patient care task that often interrupts workflow. We hypothesize accuracy of ECG interpretation will be decreased in a simulated interrupted environment compared to a controlled testing scenario.

**Discussion:** The proposed education research will utilize a simulated environment to explore the effect of task switching on ECG interpretation. Subjects, ED resident and attending physicians, will complete both a simulation and control scenario. During simulation, participants will listen to patient presentations, with instructions to remember as many details as possible. Subjects will be interrupted with stimuli (ECG’s, X-rays, lab values) from simulated triage patients. They will be given 15 seconds to evaluate stimuli for critical results before the presentation resumes. At the end of the simulation, participants will complete a presentation knowledge exam. Immediately after, participants will complete tasks in an uninterrupted control setting. They will listen to four patient presentations and complete a knowledge retention exam, then interpret all clinical stimuli all without interruption. The primary outcome is accuracy of ECG interpretation as measured by performance on matched ECG tests during simulated and control scenarios. Participant will be randomized to ECG test order. To avoid priming bias, scenario order will not be randomized. Data will be analyzed using a repeated measures generalized logistic regression model to identify and control for clinically relevant covariates.

**Conclusion:** Describing the effect of task switching on accuracy of clinical task performance has many implications. Understanding the frequency and type of ECG
errors made in an interrupted ED environment may prompt changes in the current practice of screening ED chest pain patients. However, ED care often requires providers operate in a complex, interrupted environment, making elimination of interruptions impractical. It follows, then, the results of our study could help to create educational strategies to prepare providers to optimize performance on clinical tasks during interruptions. Novel education methods, including simulation and deliberative practice, may be studied and implemented to better prepare providers for their clinical environment.

The implication of the proposed research extends beyond ED ECG interpretation. Many different healthcare providers routinely perform various important clinical tasks in interrupted workflow environments. Effects, and subsequent interventions, could be extrapolated to other specialties and tasks including imaging and lab interpretation, procedures, and clinical decision-making.

The proposed study protocol is currently pending IRB approval, with anticipated enrollment completed in the fall of 2014.

References
Board #495

**Pediatric Anesthesia Simulation: A Multidisciplinary Approach with Residents and Perioperative Nurses Using the Flipped Classroom Model** (9409)

Monday, January 12, 2015, 4:18 - 4:30 PM

Presenter: Lianne Stephenson

Professor: Ivette Motola, MD, MPH, FACEP

**Objectives:** The pediatric anesthesia rotation is often reported as being one of the more challenging rotations for anesthesia residents. Working in a different hospital with unfamiliar staff and equipment in addition to the stress of taking care of sick children precludes the use of standard didactic sessions during their two week and four week rotations. In an effort to fill the education gap, we developed a pediatric anesthesia curriculum for CA-0s, CA-1, and CA-3s using a multidisciplinary approach that includes pediatric perioperative nurses. We are currently expanding this curriculum to include the “flipped classroom” model in an effort to more effectively reach our learning objectives prior to the simulations and to engage learners who thrive in a digitally oriented world. The “flipped classroom” is one method of trying to address the exponential expansion of medical knowledge despite resident work hour restrictions that limits their exposure to educational opportunities. Currently our residents’ exam scores prior to the simulation sessions average about 60% correct. We are currently combining the “flipped classroom” model with our existing multidisciplinary approach to pediatric simulation in an effort to more effectively accomplish our learning objectives.

**Discussion:** Currently, the anesthesia interns attend a three hr introduction to pediatric simulation prior to starting their anesthesia rotation. Upon arrival they take an exam which is followed by an introduction to the Laerdal Simbaby and defibrillator usage. They are also given a pediatric airway lecture. Senior residents and nurses arrive for the last hour which includes OR cases and debriefing. The remaining monthly simulation sessions incorporate CA-1s, CA-3s, and nurses from either the operating or recovery room. The residents are given a short exam prior to the session. There is a rotating curriculum that ensures that the residents are able to meet the objectives during their training. The residents’ pediatric simulation time is protected during their preop, PACU, echo, and trauma/blocks rotations. This does not interfere with OR staffing which helps to ensure consistency in attendance. The perioperative nurse manager coordinates the nurses who will participate.

We are currently implementing a “flipped classroom” model that includes watching a 10 minute podcast prior to the simulation session at the residents’ convenience. This is followed by an exam and peer teaching upon arrival as well as a high fidelity simulation session incorporating perioperative nurses.
Conclusion: The combination of the “flipped classroom” model and a multidisciplinary approach to pediatric anesthesia education is a novel approach to educating residents. We are hopeful that the “flipped classroom” will improve the residents’ exam scores, but more importantly improve their retention and ultimately medical decision making to improve their care of pediatric patients. We are currently laying the groundwork for further studies and educational improvements.

References
Board #496

**Fundamentals of Robotic Surgery Psychomotor Skills: Metrics Development and Evaluation** (10080)
Monday, January 12, 2015, 3:30 - 3:42 PM
Presenter: Alyssa Tanaka
Professor: Kevin Reilly

**Objectives:** Medicine has come to the conclusion that the Halstedian training paradigm is no longer sufficient for the acquisition of complex surgical skills. The da Vinci Surgical System offers surgeons improved capabilities over laparoscopic surgery for performing complex minimally invasive procedures with 3D vision, tremor abolition, 4th arm control, and Endowrist manipulation; however with these advancements, specific challenges have arose. The concept of a successful surgery is encompassed by performing a quick procedure, free of errors. Robotic surgery has increased the criticality of traditional errors with the absence of force feedback, enhanced motion and force, and indirect control of instruments. Currently, no standardized assessment of robotic surgeons exists. Consensus conferences convened to develop a national curriculum called the Fundamentals of Robotic Surgery (FRS). FRS is comprised of an online curriculum and a psychomotor skills dome. The psychomotor device tests seven basic tasks of manual dexterity: Docking, Ring Tower Transfer, Knot Tying, Suturing, 4th Arm Cutting, Puzzle Piece Dissection, and Energy Dissection. The goal is to describe the development of the exercise metrics and how they are designed to take into account the specificity of robotic errors.

**Discussion:** Leaders in robotic surgery developed the basic outcomes measures and metrics for the psychomotor dome. Seven exercises and accompanying metrics were created. Following preliminary testing, those concepts were used to create a usable device and improved metrics. Time, an important surgical skill metric when associated with high quality performance, is the first metric for the exercises. Other robotic specific error metrics such as instruments out of view, instrument collision, and the application of excessive force are considered during each exercise. Task specific metrics are also attached to each exercise and are expanded on in the provided table. The metrics must be validated to be definitively included in the FRS psychomotor curriculum. This will be assessed via a pilot validation study, evaluating construct and concurrent validity during a randomized prospective study including experts and novices. They will perform the tasks on the dome and inanimate model, which will be scored using the Gears protocol and FRS metrics. This evaluation of the participants’ performance will determine if the FRS psychomotor metrics differentiate between the experienced and less-experienced surgeons. The comparison of the scores will also highlight the relevance of the metrics.
Conclusion: The described study is designed as a pilot study prior to an international study, which will involve ten sites and recruit 300 subjects. We anticipate validating the seven exercises and accompanying metrics. However, we expect some to be more challenging, such as Ring Tower Transfer. The design is far from a real procedure and can cause experts to be overly focused on the task performance. The knot tying and dissection exercise have previously demonstrated validity in a similar circumstances (Fundamentals of Laparoscopic Surgery), so we anticipate similar results for those exercises. The subjective, validated evaluation of robotic skills (GEARS) and objective Cartesian metrics may or may not correlate; however if an exercise or a metric does not appear relevant, an in-depth revision of the metrics will be performed.

References
Objectives: Learning from simulation takes place to a large extent in debriefing\(^1\), however there is still sparse knowledge about the advantages and disadvantages of debriefing methods.\(^2\) Two common forms are video-assisted and oral only debriefing. We have set out to determine if there is increased knowledge acquisition for candidates undergoing video, rather than oral debriefing.

Discussion: Qualified second year doctors were randomized to a training day with either oral or video feedback. Candidates underwent a 15 minute emergency clinical scenario followed by 30 minute feedback. The candidates completed 30 MCQs to establish baseline knowledge of treating common clinical emergency scenarios, and repeated these after simulation training. From projected statistical analysis we will have a sample size of 135 candidates. Interim results for 97 candidate’s pre and post course MCQs are available at this time. Both groups have demonstrated a statistically significant increase in their pre and post test percentage score (oral 79.9\% v 85.9\%, \(p=0.0001\), video 80.0\% v 84.9\%, \(p=0.0001\)). There is no statistically significant difference in the post test percentage scores between oral and video groups (85.9\% v 84.9\%, \(p=0.2576\)).

Conclusion: There is an improvement of knowledge from the simulation training day, but we have not demonstrated a difference between video to oral debriefing. Simulation training aims to teach human factors abilities which MCQs are unable to measure. We will also be undertaking three month interviews to analyse candidate's understanding of human factors and how they relate to their work. This will allow us to investigate further the role that video feedback can play in simulation-based learning.

References
Objectives: It is highly desirable for applicants to medical school to have work experience in a hospital environment to decide whether a medical career is for them by providing them with some realistic understanding of the profession and it’s demands.\textsuperscript{1} There are multiple barriers to achieving work experience such as limited places, uncertainty with hospital policy regarding placements and variability between centres.\textsuperscript{2} We believe that this can be addressed with high-fidelity simulation using the principles of providing a realistic and immersive environment outside the clinical setting. We hope to demonstrate multiple aspects of a doctor’s role in a realistic manner. By doing this we will be providing potential applicants with an insight into the realities of medical careers while allowing them time to reflect with an experienced and diverse faculty.

Discussion: We have advertised the simulation taster day course to all colleges within the local region. The day will consist of simulated scenarios covering operating theatre environment from a surgical and anaesthetic point of view, GP consultation, paediatric admissions, difficult communication, a medical ward round and resuscitation. The students will have the chance to observe and interact with these scenarios, followed by a session where they will discuss aspects of the scenario with faculty. A high-fidelity environment will be maintained at all times. Students will also be provided with a structured reflection form for them to complete for their own records. We would like to assess the effectiveness of our course through an improvement of self-reported confidence in the understanding of doctors’ roles before and after the taster day. We will hold a short focus group before and after the taster day to explore candidate’s beliefs and expectations of the role of a doctor, how a doctor may fit into the wider structure of the MDT and the NHS, and why they wish to pursue a career as a medic. This will allow us to establish if the taster day has altered their attitudes towards applying to medical school, and if they perceive the day to be of benefit to them.

Conclusion: We believe that this taster day in medicine will allow students from diverse backgrounds to gain experience of the day to day job of a doctor, and benefit from discussion with faculty recruited from across multiple specialties in one day. This will allow them to reflect on the realities of their aspired career, and strengthen their application to medical school. We plan proceed to the design of a similar course for potential nursing applicants.
References
Objectives: To effectively run immersive simulation, we utilise actors taking on various roles. Although some centres have a bank of medical actors for communication skills, many of these actors are unfamiliar with high fidelity simulation. As simulation-based learning becomes ever more embedded in training, we anticipate the need for an expansion in the number of actors required. We identified a need to train actors effectively in assisting to provide simulation. Currently there are very few train the trainer courses to train novice actors to prepare them for the role of actors in medical simulation. We present our proposed programme for a whole day course for novice actors which is being planned for the summer.

Discussion: We initially contacted local acting schools, and invited student actors to the courses. After an initial period working with the simulation naive actors, and taking into account their feedback and reflection we identified four domains to cover within the training day, background and purpose of simulation, the role of the actor in debrief, technology used with simulation including filming and practical theory. The acting training day will be run within our simulation centre over a day combining small group lectures and discussion, followed by practical demonstration. We will then give the actors an opportunity to practice within a real simulation led by faculty with peer feedback and discussion. We would like to assess the effectiveness of our course through an improvement of self reported confidence levels in three areas- understanding of basics of simulation and its application to medical teaching, ability to understand scenario objectives and their role in the scenario, ability to provide debrief as needed by their role, We will be using a pre and post test design to gauge improvement of confidence levels on the day. We will also gather qualitative data of their reflection of the day to enable us to get a wider perspective of their views.

Conclusion: We believe that this first train the trainer course for actors in our region will enable us create a bank of actors who will not only help deliver simulation in our centre but also maximise our ability to deliver high quality immersive simulation courses. By liaising with the actors more closely, we will be able to reflect on the scenarios and their realism We believe that our model of training can be replicated elsewhere to build a strong supply of actors.

References
**Board #500**  

**Novel Approach to the Evaluation of Simulated Hostile Patient Encounters on Stress and Performance in First-Year Medical Students (9306)**  

Monday, January 12, 2015, 4:18 - 4:30 PM  

Presenter: Daniel Topping, MD  
Professor: Kevin Reilly

**Objectives:** Commonly used in the context of undergraduate medical education, standardized patients (SPs) are individuals specially trained to facilitate instruction in a safe and supportive environment conducive for both learning and assessment. Interactions with SPs in the preclinical years allow for practice of clinical and communication skills in a setting where educators give feedback and evaluate performance to better prepare students for real patient encounters. In the first-year curriculum at our institution, SPs provide low-stress encounters by being friendly and cooperative. While this kind of training has shown to prepare medical students well for their clinical years, it remains largely unknown how interactions with uncooperative, hostile SPs affect the stress experienced by students and their subsequent performance. In this study, we assessed first-year medical students before, during and after encounters with SPs who displayed behavior that was either calm (control) or hostile (experimental). Our aims were to compare students’ stress levels and recovery (measured subjectively and objectively), as well as measure their performance in the simulated patient encounters.

**Discussion:** Twenty-nine (29) first-year medical students from the University of Central Florida College of Medicine were randomly assigned to two groups (experimental, n=14; control, n=15) to obtain a full medical history from an SP. SPs for the experimental group communicated in an uncooperative and difficult manner, while SPs in the control group displayed a calm and pleasant demeanor. Levels of stress were measured at baseline, immediately after the encounter (time=0), and at four, 15-minute intervals thereafter. At each time point, students completed a six-item State Trait Anxiety Inventory (STAI; scores range 6-24) and provided a sample for salivary cortisol (SC; mcg/dL) analysis. STAI and SC levels are respective measures of subjective and objective stress. SPs evaluated student performance using a 15-item dichotomous (Yes/No) checklist of targeted behaviors (maximum score=100%). SC levels changed significantly across time (Figure 1;p<0.001), and peaked at 15 minutes post-encounter in both groups. STAI scores also changed significantly across time (Figure 2;p<0.001), and were significantly higher for the experimental group immediately following the encounter (p=0.04). SP checklist scores differed significantly between groups (control=100%, experimental=92.9%,p=0.01).

**Conclusion:** SC peaked at 15 minutes post-encounter in both groups with a similar fall in levels to below baseline at all subsequent time points. Immediately post-
encounter, STAI scores were significantly higher for the experimental group; however, in the control group, scores fell to levels below baseline, with both groups displaying a similar decline thereafter. Based on fluctuating STAI and SC levels, students in the hostile group subjectively and objectively experienced elevated stress. SP checklist scores differed significantly between groups, but given the high mean scores of both groups (ceiling effect), the difference was not considered appreciable. Future assessments will focus on higher-level tasks to quantify differences. The rapid peak and fall of stress levels, consistent with similar studies, implied that students had an authentic experience with no lasting harmful consequences. We plan to incorporate more difficult patient encounters on a larger scale in our curriculum, and to measure relationships between stress and performance in high- and low-stakes settings. It is our aim to determine the appropriate amount and type of inducible stress, with the goal of creating robust and realistic patient encounters to better prepare our students for the challenges of clinical care.

References
Objectives: The objective of this project is to describe the development and implementation of a crisis checklist intervention using simulation for low frequency high-risk patient events. The recommendation to reduce complications and improve quality and safety in healthcare is clear; however, the best way to accomplish this remains largely unknown.\(^{1-6}\) Safety checklists are one methodology that have clearly demonstrated positive effects for facilitating multistep processes leading to improved team dynamics and error reduction in several high-risk complex work environments including aviation, nuclear power, and the military.\(^{7-12}\) Although common in other industries, checklists have only recently been embraced as part of the workflow processes in the healthcare setting.\(^{13-20}\) However, despite checklist utilization in complex healthcare settings there are few studies describing the design and development of clinical checklist to optimize implementation and effectiveness in high-risk patient populations.\(^{13,14,17-20}\) The purpose of this project is to explore the development and effect of a crisis checklist on patient safety and adherence to best practice guidelines for rare but highly complex patient’s requiring the Impella® left ventricular assist device in a cardiac intensive care unit (CICU).

Discussion: A prospective before-and-after design will be used to examine the effectiveness of a crisis checklist intervention on patient safety and adherence to best practice guidelines for high risk CICU patients requiring the Impella® left ventricular assist device in a large academic medical center in Southeastern Michigan. This project will involve the creation and implementation of specialized read and verify and read and do checklists addressing the most common assessment requirements, errors, alarms, and emergencies for the Impella® device. The intervention will consist of a traditional evidence based didactic curriculum followed by two high-fidelity simulation sessions. A primary outcome measure will be nursing adherence to critical processes of care with the rare but highly complex Impella® patient. Participants will also be surveyed regarding their perceived self-confidence and self-efficacy as well as the perceived utility and clinical relevance of the crisis checklist design. All educational sessions will take place during a six-month time period from March 2014-September 2014, with each educational activity completed in sequential order.

Conclusion: This project seeks to fill an important gap in knowledge related to the development, design, adaptation, and implementation of a crisis checklist targeted at a low frequency high risk ICU patient population with a percutaneous left ventricular assist device. During this project, two checklist designs will be employed
to assist the nurse and patient care team with monitoring, managing, and caring for a patient with a complex invasive life support device. The project will examine both the design and the utility of the checklist for use with Impella ® patients as well as the adherence to accepted safety processes that would decrease the likelihood of serious harm. The long term objective is to improve adherence to accepted processes of care by establishing checklists as standard practice for low frequency, high risk invasive life support devices in high –risk acute care settings ultimately reducing the risk of human error. It is hypothesized that adoption of checklists will improve the self- confidence and self- efficacy of the nursing staff in caring for an Impella ® patient while with improving their adherence to accepted safety practices leading to a reduction in the rate of complications and errors in CICU Impella ® patients.

References
12. Joint Commission (JCAHO) Sentinel Event Statistics Data-Root Causes by Event Type
Board #502  
**Simulated Learning in Emergency Training for High Dose Rate (HDR) Brachytherapy** (9642)  
Monday, January 12, 2015, 3:42 - 3:54 PM  
Presenter: Tess M Vawser, RN CCRN GCHPE GCCS  
Professor: Takashi Shiga, MD, MPH, FAAEM

**Objectives:** During a high dose rate (HDR) brachytherapy treatment, the likelihood of the source not retracting or source detachment is very low due to the safety mechanisms built into the HDR unit. However AAPM TG 59 recommends that all departments providing HDR brachytherapy should have Emergency Procedures in place and routinely test and practice the procedures. A simulated learning program has been developed to provide training and feedback to the Brachytherapy staff in the case of a HDR emergency.

**Discussion:** Utilizing hybrid simulation methodology, a part task training model attached to a simulated patient, a HDR emergency was simulated with the Nucletron® applicator and remote afterloader. The simulation was recorded on five cameras, with four members of the brachytherapy team performing the documented emergency procedure. Critical review of the simulation was undertaken against the documented procedure and fed back to the staff. Four simulations were carried out and after each simulation a debriefing took place. Gaps within the emergency procedures were identified and processes were put in place to improve and refine the emergency procedures. Reviewing the simulations, it was clear that staff movement throughout the emergency situation needed improvement as well as highlighting the importance of communication. We were able to improve on our total emergency response time by 18%.

**Conclusion:** HDR remote afterloader systems are designed to minimize the possibility of non retraction of the 192Ir source; however staff must be well versed in the emergency procedure with regular training sessions. A simulated learning program has been developed that can provide feedback on timeliness, success and potential improvement in the emergency system. Using simulation is a novel learning tool for Brachytherapy avoiding dose to staff and patients.

**References**  
Board #503
From Clinic to Courtroom: The Objective Structured Clinical-Legal Encounter (OSCLE) for Improved Management of Child Sexual Abuse (9211)
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Ingrid Walker-Descartes, MD
Professor: Takashi Shiga, MD, MPH, FAAEM

Objectives: Child abuse and neglect are leading public health concerns. Residency programs struggle with teaching appropriate management of such cases. Studies show that practicing pediatricians lack knowledge and confidence on management of this issue. We sought to develop and evaluate a curriculum for teaching resident competencies for the recognition and management of child sexual abuse.

Discussion: The curriculum focuses on the following competencies: screening, eliciting and documenting a history, doing and documenting focused genital exam, knowledge of mandatory reporting statutes, communication of the medical evaluation to other agencies, and presenting medical findings in the courtroom. Incorporated are structured debriefings to discuss relevant curricular content and impact on the learner. It consists of three components: the patient encounter, documentation component and the court encounter. Pediatric Residents from a large training program in NYC completed a pre-OSCLE survey on with 19 Likert-scaled items on their experience, knowledge and confidence in handling child sexual abuse. One week after the OSCLE training, they completed the post survey.

Conclusion: To date 63 residents have completed the training. Since a new child abuse service and training was also implemented, we decided to focus on only the PGY 1 early in their training. Analyses are underway. This curriculum might prove a useful adjunct to didactics traditionally employed to teach and reinforce the competencies for management of child sexual abuse.

References
5. Smeekens, et.al; Successful e-learning programme on the detection of child abuse in Emergency Departments: a randomised controlled trial


Board #504

From Saving to Preserving: Integrating Funeral Service, Medical Laboratory Technology, Associate Degree Nursing, and Paramedic Students into a Mega-Interprofessional Simulation Scenario (8072)

Monday, January 12, 2015, 4:06 - 4:18 PM

Presenter: Rana Walley, MCS, MLS (ASCP)cm
Professor: Takashi Shiga, MD, MPH, FAAEM

Objectives: The purpose of this study was to evaluate the effectiveness of introducing Paramedic, Funeral Service Technology (FST), Medical Laboratory Technology (MLT), and Associate Degree Nursing (ADN) students to an interprofessional simulation scenario. The overall objective of this study was to facilitate the students’ understanding of the roles of other healthcare professionals and to be able to describe how they fit together as a healthcare team.

Discussion: The interprofessional faculty team used a 1.5 hour trauma simulation scenario with components for allied health and Nursing students to observe other disciplines working to meet their specific objectives of care. Students were provided with opportunities for realistic patient handoff and interprofessional communication. The FST, MLT, and ADN students observed the Paramedic students extract a “patient” from a car. Patient care was passed to the ADN students waiting in the Simulation Center ED. MLT and ADN students observed the Paramedic and FST students collaborate in the transfer of a fatality from the MVA into a hearse. The ADN students assessed, cared for, and drew blood on the surviving patient. The MLT students took the stat interacted with the ADN students to emergency release of 2 units of blood. The effectiveness of this multi-disciplinary simulation scenario was evaluated using the CAE/METI Simulation Effectiveness Tool (SET). Faculty also evaluated each student’s ability to meet discipline-specific objectives for the scenario using a Likert-scale rubric that were developed based on the After-Action debriefing method. Students were provided with the opportunity to debrief separately with their own discipline and together will all disciplines.

Conclusion: Mean scores on the SET for each discipline was as follows: Nursing students: 2.79/3; Medical Laboratory: 2.27/3; Funeral Service: 2.47/3; and Paramedic: 2.65 with an overall average of 2.54/3 for all allied health disciplines. Do it again was a resounding response by students who participated in this scenario. Students also commented on the benefit of hands-on learning in preparation for real-life situations and were supportive of the opportunity and the value of debriefing to better understand the roles of other disciplines. All students, from all disciplines reported that they learned how each healthcare discipline uniquely contributes to patient care and recommended simulation center scenarios for future students.
References
Objectives: Simulated death is viewed as a controversial learning tool, with concerns such as potential psychological harm to the learner and maintaining the simulation lab as a “safe” space. Use of simulated death has been shown to be widespread in healthcare simulation. Stress has been shown to enhance learning and memory creation through neurobiological pathways such as cortisol release. Emotional stressors have been shown to increase participant performance in simulated cardiopulmonary arrest. Data from our institution currently in review has shown enhanced learning and improved performance in residents when simulated death as a result of clinician failure is allowed to occur. There is sparse data in the literature about learner attitudes toward simulated death and there is no evidence to support current concerns about simulated death. We believe that allowing simulated death to occur maintains fidelity and results in enhanced participant learning and performance without negatively affecting the learner. Our objective is to determine if there is a link between learner attitudes about simulation and exposure to simulated death. Our hypothesis is that exposure to simulated death does not negatively affect learner attitudes toward simulation.

Discussion: An anonymous survey will be distributed to all participants in full environment simulation at our institution. All simulation scenarios will take place at the Human Emulation, Educational and Evaluation Lab for Patient Safety and Professional Study (HELPs) Simulation Center in the Department of Anesthesiology at the Icahn School of Medicine at Mount Sinai. Scenarios range from certification sessions for anesthesiology attending physicians to teaching sessions for medical students. We anticipate the number of respondents to be greater than 1,000. Participants below the medical student level will be excluded from the survey. The survey is conducted immediately following any simulation and may be completed only once by each respondent. Demographic data will be collected for the learners’ clinical level, number of years in practice, number of previous simulation scenarios, and number of previous exposures to simulated death. For the simulation immediately preceding the survey, data will be collected for exposure to simulated death, if the simulation was helpful, if the simulation will cause a change in practice, and if the participants prefer to experience simulated patient death or not. Participants will be asked to rate the simulation experience on a Likert scale 1-5.

Conclusion: We have data for 280 learners. 52% were residents, 32% were attending physicians, 12% medical students, and 4% nurses. Mean years in practice for all learners was 3.8. Mean number of previous scenarios was 3.2 and mean
number of previous scenarios involving simulated death was 2.4. Survey responses were separated into groups based on exposure to simulated death in the scenario immediately preceding the survey. Demographic data is similar among the two groups. 212 learners (76%) were exposed to simulated death and 68 learners (24%) were not. In the simulated death group, 96% of learners found the simulation helpful, 75% of learners would change their practice as a result of the simulation, and 72% of learners prefer simulated patient death to be a part of their simulations. Learners in the simulated death group rated the simulation 4.5/5. In the non-death group, 92% of learners found the simulation helpful, 68% of learners would change their practice as a result of the simulation, and 66% of learners prefer simulated patient death to be a part of their simulations. Learners in the non-death group rated the simulation 3.6/5. Based on our preliminary results, exposure to simulated death does not negatively (and may even positively) affect learner attitudes about simulation.

References
Board #506

**Serious Medical Game (SMG) Encompassing the Continuum of Care: Air Force Medical Modeling and Simulation Training (AFMMAST) (8515)**

Monday, January 12, 2015, 3:30 - 3:42 PM
Presenters: Grady Wier
Professor: Ken Johnson

**Objectives:** Project Objectives: 1) Air Force Medical Modeling & Simulation Training (AFMMAST) Vision for Serious Medical Game concept with application across the DoD; 2) Overview of current validation study of point-of-injury (PoI) game in collaboration with the Medical Education & Training Campus (METC) and Basic Medical Technician Corpsman Program (BMTCP); and 3) Demonstrations of current game concepts to include point-of-injury (PoI), Expeditionary Medical Support (EMEDS) Emergency Room (ER), and EMEDS Intensive Care Unit (ICU) environments with associated patient cases.

**Discussion:** The Air Force Medical Modeling and Simulation Training (AFMMAST) program was awarded a Small Business Innovation Research (SBIR) grant to develop a web-based serious medical game (SMG) that covers point-of-injury (PoI), medical transport to field hospital, and critical care air transport to a level 1 trauma hospital. A web-based SMG is vital for the future training of all medical corps. Digital natives, or those who were born during a time where the economy is based on computerized information, are captivated by different learning platforms than our current service leaders. Digital technologies are a part of these individuals' everyday lives. Digital programs intrigue and excite them, enhancing their desire to learn. SMGs serve as a realistic platform for cognitive learning and enable individuals to manage difficult medical cases prior to actual patient care.

**Conclusion:** AFMMAST has current Phase II funding from the SBIR program to complete fully realized game-play for PoI, Expeditionary Medical Support (EMEDS) Emergency Room (ER), and EMEDS Intensive Care Unit (ICU) environments. AFMMAST will demonstrate current game progress for these environments to the group. Each game module will include game play that allows learners to assess and treat injured patients, produces after-action reports (AAR) for immediate feedback, and transfers game completion data to a central database. AFMMAST is currently validating the PoI game module as part of the Basic Medical Technician Corpsman Program (BMTCP) with the Medical Education & Training Campus (METC) at Ft Sam Houston, TX. The aim is to assess the training effectiveness of the SMG on improving BMTCP students’ success rate on the National Registry Emergency Medical Technician (NREMT) examination. The potential cost savings related to reduction of student wash back is substantial. If proven effective, Navy and Air Force students will be required to participate in the SMG as part of the BMTCP course curriculum. Available preliminary results will be presented to the group.
References
None listed.
Board #507

Brief Intervention to Counter Workplace Incivility Pilot Study: Capturing Biomarker Data, Psychological Stress and Effects on Safe Patient Care (9261)

Monday, January 12, 2015, 3:42 - 3:54 PM
Presenter: Janet K Willhaus, PhD, RN, CHSE
Professor: Ken Johnson

Objectives: Workplace incivility (WI) has been identified as a safety hazard by The Joint Commission\(^1\) and has a negative impact on mental health, nursing productivity, and job turnover.\(^2\).\(^-\)\(^5\) Although the incidence of workplace incivility (WI) among new nurses is high, there have been no biological attempts to measure its effect and observe its potential impact on patient safety. Surveys measure the perception of WI on patient care, but clinical outcomes are less well documented.\(^7\) Surveys and interviews can estimate the financial costs of WI in lost productivity and turnover, but no studies to date have identified the physiological impact of stress, or its effect on patient care. Personal resilience has been shown to offset the negative effects of WI\(^2\), but to date there are no attempts to test or measure a resiliency intervention for WI. Resilience is characterized as positive coping\(^8\) and found to be related to work attitudes, satisfaction, happiness, and commitment. Research Questions: 1) Is there a measurable pattern of psychological and physiological stress and resilience in student nurses exposed to WI? 2) Is patient care and safety altered when nursing students are exposed to WI?

Discussion: A convenience sample of seven nursing students was recruited and screened for possible reaction to emotional distress using the PTSD screening instrument the PCL-C.\(^9\) to screen. No participants met the benchmark score of 30 or higher, set for exclusion from the study.\(^9\) Participants received a 45 minute cognitive rehearsal coping training upon arrival and after consent. After the cognitive rehearsal, each participated in a simulation where report was received from a verbally abusive coworker after which the student participant provided a morning assessment and medication pass for a standardized patient. Before and after the report, after the patient care and after the debriefing, the participant completed the Brief Resilience Scale\(^10\) and the Stress Appraisal Scale\(^11\). Saliva samples were also taken for alpha amylase (a biomarker of stress) and nerve growth factor (a biomarker for resilience) at the same intervals. Heart rate measures were also collected using a Sigma Onyx Fit heart rate monitor. Debriefings were recorded for thematic analysis about the simulation experience. Written and biological measures will be analyzed using repeated measures ANOVA.

Conclusion: Initial results indicate that the participants found the verbally abusive coworker believable. During debriefing several indicated that the tone and demeanor of the off-going nurse in report left them concerned about safety and their ability to care for the simulated patient. The standardized patient indicated
that none of the participants had discussed medication side effects with him and that none had provided instruction for a new medication he received in the scenario. This pilot was designed to help the investigators plan for a larger study with a similar design. Input about the data collection was received from the participants, standardized patient, simulation technician, and research assistants to help the primary investigators shape the larger study. The use of a team to help refine research design and data collection details has proved invaluable for planning the larger study.

References
Residents Do Not Designate a Team Leader during Mock Codes (10257)
Monday, January 12, 2015, 3:54 - 4:06 PM
Presenter: Dr. Kellie Nicole Williams
Professor: Ken Johnson

Objectives: Poor team leadership, and lack of assigned duties can result in chaos, confusion and possible errors during a code. Errors lead to repetition of tasks and incomplete procedures, resulting in negative patient outcomes. We hypothesize that pediatric residents do not regularly identify themselves as the team leader or assign team roles during mock codes.

Discussion: In 2012, an in-situ mock code program was re-instituted at Children’s Hospital of the King’s Daughters (CHKD) to evaluate the effectiveness of the PGY-2 and PGY-3 residents during simulated codes. All mock codes were unannounced, were conducted in the general pediatric units of CHKD and included two PGY-3 residents and one PGY-1 or PGY-2 resident. Simulation manikins from the Sentara Center for Simulation and Immersive Learning represented patients. An observational rating tool was used to record declaration of leadership and team member assignments. Review of the rating tool showed that of six mock codes observed, the PGY-3s declared leadership on only two occasions and of these, only one assigned tasks to the other members of the code team. In addition, one team leader performed tasks that should have been assigned to another team member such bag mask ventilation, intubation, compressions, family interview, and drawing up and administering medications.

Conclusion: Pediatric residents do not regularly identify themselves as team leaders or assign team member roles in simulated codes. In order to improve the code team structure, a new and innovative curriculum will be introduced to the pediatric residents beginning in July 2014. This curriculum will incorporate the TeamStepps program and simulated patient encounters structured around team building events in order to educate residents on the importance of team leadership and communication. After the program’s implementation, it is expected that residents will regularly declare leadership and identify team member assignments during mock codes.

References
Board #509

**Lean'ing In: Utilizing Simulation in a Plan-Do-Study-Act Cycle for Continuous Quality Improvement in the Emergency Department** (9030)

Monday, January 12, 2015, 4:06 - 4:18 PM  
Presenter: Nelson Wong, MD  
Professor: Ken Johnson

**Objectives:** Lean management principles are increasingly being applied to continuous quality improvement (CQI) in healthcare, in order to improve patient outcomes, increase patient satisfaction and maximize efficiency.\(^1\)\(^-\)\(^3\) These methodologies include systematic approaches to maximize value along with an operational commitment CQI among all staff. Within this model, Plan-Do-Study-Act (PDSA) cycles are often used as a tool to repetitively define, test, examine, and refine process.\(^3\) Simulation lends itself to the application of all parts of the PDSA cycle for CQI in clinical practice.\(^2\) The Massachusetts General Hospital (MGH) Emergency Department (ED) introduced a new protocol for deep procedural sedation (PS) in 2014. As part of the rollout process, small-group simulation training sessions were offered as interprofessional learning opportunities for all attending physicians and nurses. Staff participation in these sessions provided a robust venue for a simulation-enhanced PDSA cycle, prior to actual clinical deployment.

**Discussion:** Between February 4 and May 9, 2014, over 50 deep PS simulation sessions were run as part of an educational in-service for ED attendings and nurses. These sessions involved interprofessional teams rehearsing protocols and managing complications of deep sedation cases. Field notes and video of the sessions were recorded. Debriefings were facilitated by a dedicated MD-RN team who highlighted key aspects of the new policy, including drug choice and management of side effects. Furthermore, to identify specific CQI issues, debriefings included a semi-structured interview done in the “plus-delta” format.\(^4\) Participants were asked the following questions: 1) When reflecting on the simulation cases or clinical PS cases what factors positively contributed to the safe and efficient performance of the sedation? 2) What factors could be improved in order to provide safe and efficient performance of the sedation? 3) Any additional comments or questions regarding the ED deep sedation protocol? Field notes were analyzed to identify critical areas for discussion prior to clinical deployment. Video recordings of team performance will be assessed using standardized team performance and best practice safety indices to establish a pre-rollout baseline for longitudinal QA study.\(^5\)\(^,\)\(^6\)

**Conclusion:** Fifty-two (52) physicians and 109 nurses completed sessions representing over 96% of ED attendings and 57% of ED nursing staff. Mean age of participants was 37.8 years and 42 years for nurses and physicians respectively. Mean time spent in clinical practice were 13.8 years for nurses and 11.7 years for
physicians. Mean experience in the MGH ED were 9.62 years for nurses and 10.8 years for physicians. Major findings in the planning phase were grouped in four areas – Policy, Preparation, Logistics and Resources (Table 1). These elements have been incorporated into recommendations representing the first iteration of a PDSA cycle. After clinical implementation of the new protocols, the study team will review QA documentation, gather continuous staff feedback from an online survey, and engage in additional simulation based team performance assessment. These data will be compared to baseline data to gauge progress and support further PDSA cycles.

References