Within-Team Debriefing versus Instructor-Debriefing for Interprofessional Simulation-based Education: A Prospective Randomized Trial

Boet, Sylvain (The Ottawa Hospital, Ottawa, ON, CAN); Bould, M Dylan (Children’s Hospital of Eastern Ontario, Ottawa, ON, CAN); Sharma, Bharat (Allan Waters Family Patient Simulation Centre, Toronto, ON, CAN); Reeves, Scott (Li Ka Shing International Healthcare Education Centre & Li Ka Shing Knowledge Institute of St Michael’s Hospital, Toronto, ON, CAN); Naik, Viren (The University of Ottawa Skills and Simulation Centre, Ottawa, ON, CAN); Triby, Emmanuel (Faculté de Sciences de l’Education, Strasbourg, FRA); Grantcharov, Teodor (Allan Waters Family Patient Simulation Centre, Toronto, ON, CAN)

Objective: This study compared the effectiveness of within-team debriefing (led by the individuals of the team itself without external instructor) to that of instructor debriefing on interprofessional team performance during a simulated operating room (OR) crisis.

Methods: After IRB approval, 120 participants were grouped into 40 teams consisting of one anesthesia resident, one surgical resident and one staff circulating OR nurse. An actor played the scripted role of an OR scrub nurse. All teams managed a simulated crisis scenario (pretest). Teams were then randomized to either a within-team debriefing or an instructor debriefing. In the within-team debriefing group, the teams reviewed the video of their scenario by themselves with a debriefing guide based on the Ottawa Global Rating Scale. The teams in the instructor debriefing group reviewed their scenario, guided by a trained instructor. Immediately following debriefing, all teams were recorded managing a different intraoperative crisis scenario (post test). After data collection, three blinded expert examiners rated all performances in a random order using the validated TEAM scale.

Results: A two-way, mixed ANOVA detected a significant improvement in team performance from pretest to posttest ($p=.008$) with no significant effect of the debriefing type received ($p=.91$). The effect of debriefing modality showed no interaction with respect to pre or post test performance ($p=.52$).

Conclusion: Within-team debriefing results in measurable improvements in team performance in simulated crisis scenarios, and may be as effective as instructor team debriefing for interprofessional team-based simulation, which could improve cost-effectiveness and flexibility of scheduling.
Emotions, Cognitive Load, and Learning Outcomes During Simulation Training
Fraser, Kristin (University of Calgary, Calgary, AB, CAN); Ma, Irene (University of Calgary, Calgary, AB, CAN); Wright, Bruce (University of Calgary, Calgary, AB, CAN); McLaughlin, Kevin (University of Calgary, Calgary, AB, CAN)

Our objective was to assess the emotional reaction and cognitive load of learners during simulation training, and the association between these and learning outcomes.

Participants were 84 first year medical students at the University of Calgary training on a cardiorespiratory simulator (Harvey). We used an eight item rating scale to assess students’ emotional reaction to training, and a nine-point Likert-type rating scale to assess cognitive load. We evaluated diagnostic performance on the same simulated clinical findings one hour after training. We used factor analysis to identify the principal components of emotion, and multiple linear regression to study the association between emotion and cognitive load, and cognitive load and diagnostic performance.

We identified two principal components of emotion, representing “enjoyment” and “anxiety”. We found a significant positive association between both enjoyment and anxiety and cognitive load (regression coefficient [95%CI] 0.66 [0.31, 0.01], p < 0.001 and 0.47 [0.13, 0.82], p = 0.007, respectively). There was a non-linear (inverted U) relationship between cognitive load and diagnostic performance, with significantly lower diagnostic performance for students in the highest cognitive load tertile (p < 0.001).

Emotions experienced during simulator training are associated with perceived cognitive load, which is, in turn, related to learning outcomes. Specifically, learning outcomes decline with high levels of cognitive load. Further studies are needed to evaluate aspects of simulation that contribute to emotions and cognitive load so that we can maximize learning outcomes.
A New Attitude Questionnaire Designed to Evaluate Undergraduate Health Professional Student Attitudes Toward the Relevance of Simulation, IPE, and the Precepts of Teamwork

Sigalet, Elaine (University of Calgary, Community Health Science, Division of Medical Education and KidSIM ASPIRE Research Team, Calgary, AB, CAN); Grant, Vince (University of Calgary, Faculty of Medicine, and KidSIM ASPIRE Research Team, Calgary, AB, CAN); Robinson, Traci (KidSIM-ASPIRE Pediatric Simulation Research Program, Alberta Children's Hospital, University of Calgary KIDSIM Program Alberta Children's Hospital, Calgary, AB, CAN); Donnon, Tyrone (University of Calgary, Community Health Science, Division of Medical Education and KidSIM ASPIRE Research Team, Calgary, AB, CAN)

There is no standardized measure in health professional education to evaluate attitudes of participants to the learning modality used to deliver interprofessional education (IPE). The KidSIM Attitude Towards Teamwork in Training Utilizing Designed Educational Simulation (ATTITUDES) Questionnaire was developed to assess learners’ attitudes towards relevance of simulation in teaching IP teamwork, the IPE, and the concepts of teamwork. A quasi-experimental pre-test/post-test research design was used. Consenting undergraduate students (n=196) from nursing, medicine and respiratory therapy completed the questionnaire prior to and immediately after engaging in two scenarios of pediatric critical illness (sepsis, seizure, anaphylaxis or asthma). All learning was conducted as an interprofessional team. There were highly significant increases in the value placed on an IPE curriculum, utility of simulation in teaching IPE, and the role of teamwork in delivering patient care (each p < 0.001) in all student groups. The internal reliability coefficient (Cronbach’s alpha) of the KidSIM ATTITUDES questionnaire was \( \alpha = .95 \). An exploratory factor analysis resulted in a five-factor solution accounting for 61.6% of the variance. Factors suggest we measured relevance of simulation (\( \alpha = 0.83 \)), relevance of IPE (\( \alpha = 0.90 \)), communication (\( \alpha = 0.84 \)), roles and responsibilities (\( \alpha = 0.86 \)) and situation awareness (\( \alpha = 0.77 \)). The reliability of the IPE and teamwork subscales are higher than reported on other questionnaires, particularly the roles and responsibility factor previously reported to be < .50. These results support the value of high-fidelity simulation as a learning modality for IPE, and the reliability and construct validity of the newly developed KidSIM ATTITUDES questionnaire.
Standardized Actors as Performance Evaluators in Simulation-Based Multiple Mini-Interviews for Selection for Entry into Medical School: Would the Same Candidates Get In?  
Easty, Laura (McGill University, Montreal, QC, CAN); Moreau, Louis-Charles (McGill University, Montreal, QC, CAN); Young, Meredith (McGill University, Montreal, QC, CAN); Kagan, Lisa (Arnold and Biema Steinberg Medical Simulation Centre, Montreal, QC, CAN); Razack, Saleem (McGill University, Montreal, QC, CAN)

**Objective:** Applicant performance evaluation by standardized actors (SA’s) has not been previously reported on in the setting of multiple mini-interviews (MMI’s) for medical student selection. We compared the reliability of evaluations made by SA’s vs. expert evaluators (admissions board members) in this context.

**Methods:** Expert Evaluators and SA’s rated student performance on a 5-item, 7-point modified Likert scale (5th item always being a ‘global suitability for medicine’ rating). Reliability was examined using generalizability theory, and consistency across SA’s’ and Experts’ ratings was examined using Spearman rank (ρ).

**Results:** Total station scores correlated positively between the two evaluator groups (r=.71, p<0.0001). The two evaluator groups ranked applicants similarly (ρ = 5.4, p<0.01). Experts were more reliable than SA’s in both station specific questions (reliability (4 station specific) questions: Expert: 0.17, SA: 0.11) and global ratings (reliability 5th item: Expert: 0.17, SA: 0.10). SA’s agreed with Experts for upper quartile ranking for 44 applicants (vs. 67 for the Experts). As for how this would translate into decision making (i.e. offer of position or not), for top-ranked candidates SA’s would not have admitted a total of 54 applicants (out of 160 offers) that the faculty evaluators would have (a 33% discrepancy).

**Conclusion:** In multiple mini-interviews, scenario standardized actors show significant agreement with expert evaluators on applicants’ performance and rank. There are, however, differences in final applicant rankings between the SA’s and the evaluators, and further study to elucidate these differences is warranted.
Team Training in Trauma (3T): A Model for Evidence-Based Interdisciplinary Crisis Management Training Curricula.
Keshet, Itay (St. Michael’s Hospital, Toronto, ON, CAN); Doumaras, Ari (St. Michael’s Hospital, Toronto, ON, CAN); Ahmed, Najma (St. Michael’s Hospital, Toronto, ON, CAN); Hicks, Christopher (St. Michael’s Hospital, Toronto, ON, CAN)

Introduction: Effective management of complex crises calls on a spectrum of non-technical skills, yet surgical training has traditionally focused on technical skills and medical knowledge. Crisis management skills have been under represented in many surgical curricula despite evidence for significant patient safety benefits. The nature of crises as rare, episodic events necessitates the use of high-fidelity simulation for deliberate practice, yet increasingly elaborate technologies and an evolving body of literature create a confusing landscape.

Methods: A meta-analysis of team-based crisis management training was conducted to establish best-practice guidelines. A novel half-day interdisciplinary curriculum was then developed (n=18). Face validity was assessed using the Participant Evaluation of Training Quality (PETQ). Shifts in learner attitudes were assessed pre and post intervention using the Human Factors Assessment Scale (HFAS), and behaviour changes were determined in real time using the Mayo High Performance Team Scale (MHPTS).

Results: Participants valued the exercise (mean PETQ score=.81, sd=0.1). There was a mean 7.2% change in HFAS score from pre to post intervention (paired t-statistic = 4.85, df=17, p < 0.0001). Raters’ assessment of team performance on MHPTS demonstrated a significant improvement at midpoint (p=0.017) and endpoint (p=0.033) relative to baseline.

Conclusion: Crisis management training benefits patient safety in the trauma setting. Given the significant resource commitments required to deliver crisis management training, there is a need for a best practice set of guidelines. To this end, current research was distilled into methods that demonstrated strong face validity, significant positive changes in attitudes, and real performance benefits.
Gender Differences in Spatial Abilities in Medical Students Entering Their Residency Programs: A Five-Year Experience.

**Objective:** Spatial abilities consist of visualization, orientation and manipulation of structures in space. Spatial abilities have been related to 3-D anatomy knowledge and the performance in technical skills. The objective was to assess gender differences in spatial abilities in the medical field. The a priori hypothesis was to test for gender differences in spatial abilities in medical students entering their residency programs in a five-year experiment.

**Methods:** A cohort of 214 medical students entering their residency programs was enrolled in a prospective study from 2005 to 2010. Data was not collected in 2009. Spatial abilities were measured with a redrawn Vandenberg and Kuse Mental Rotations Tests in two (MRTA) and three (MRTC) dimensions. The maximum scores were 24 for MRTA and MRTC. Descriptive statistics included frequency and percent and mean ± standard deviation. The MRTA and MRTC scores were evaluated using a two-way analysis of variance with two between factors (year of study and gender). The Student's t-test was used to compare gender to MRTA and MRTC scores.

**Results:** No gender by time interaction or main effect of year was found. For the main effect of gender, differences favouring males were identified in 131 (61.2%) female and 83 (38.8%) male medical students with the MRTA score (11.7 ± 4.2 vs. 15.0 ± 4.2, respectively; p < 0.0001) and MRTC score (6.9 ± 3.1 vs. 9.9 ± 4.6, respectively; p < 0.0001).

**Conclusion:** Gender differences in spatial abilities favouring males were demonstrated in the medical field in medical students entering their residency programs in a five-year experiment. Future research will need to assess the implication of this knowledge for simulation-based learning.
A Comparison of the Ottawa GRS and the ANTS Scale for Evaluating Performance in Crisis Resource Management Simulation Scenarios

Fisher, Rachel (McGill University, Montreal, QC, CAN); Young, Meredith (McGill University, Montreal, QC, CAN); Jecen, Nikole (McGill University, Montreal, QC, CAN); Ramadori, Francesco (McGill University, Montreal, QC, CAN); Snell, Linda (McGill University, Montréal, QC, CAN)

With increasing recognition, and importance of team leadership in crisis situations, simulation has become a natural place for the teaching, practice, and assessment of such skills. With no current gold standard, several tools have been proposed for the evaluation of non-technical Crisis Resource Management (CRM) skills, and here we compare two tools the University of Ottawa Crisis Resource Management Global Rating Scale (Ottawa) and the Anesthesia Non-Technical Skills Scale (ANTS).

22 anesthesia residents (R1 & R2) participated in at least two high-fidelity CRM scenarios. Scenarios were recorded and evaluated later by a single rater using both scales, blinded to training level of participants. Scale validity was examined comparing scores from R1s and R2s, and internal structure was examined using a Factor Analysis. Reliability and Internal Consistency was examined using G-Theory.

Ratings on both the ANTS and the Ottawa Scale distinguished between training levels (ANTS: R1 mean (SE)=10.5(3.9), R2=13.54 (2.9), t (21)=4.49, p<0.001; Ottawa: R1=19.21(4.62), R2=24.39(4.75), t(21)=5.17, p<0.001). Total scores on the ANTS and Ottawa correlated (r=0.87, p<0.001), and when all items on both tools were entered in a Factor Analysis, a single factor emerged that explained 79.9% of the variance in scores. For both scales, internal consistency was high (ANTS=0.95, Ottawa=0.96), however, the Ottawa scale was more reliable overall (Ottawa=.74, ANTS=0.53). Anecdotal evidence suggests that the Ottawa scale is better suited for training novice raters.

The Ottawa and ANTS scales appear to measure the same underlying constructs, and performance correlates well across the scales, the Ottawa scale appears to be more reliable, and easier to use.
Mastery versus Standard Proficiency Targets for Basic Laparoscopic Skill Training: Effect on Skill Transfer and Retention
Kolozsvari, Nicoleta (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Kaneva, Pepa (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Brace, Chantalle (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Vaillancourt, Marilou (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Banaszek, Daniel (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Cao, Jiguo (Department of Statistics and Actuarial Science, Simon Fraser University, Burnaby, BC, CAN); Demyttenaere, Sebastian (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Vassiliou, Melina (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Feldman, Liane (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Fried, Gerald (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN)

We investigated whether part-task training with a basic simulator task (peg transfer, PT) facilitates learning a more complex skill (intracorporeal suture, ICS) and compared the effect of PT overtraining with standard PT training on learning the ICS task.

Ninety-eight participants were randomized to one of three PT training groups: controls (no practice), standard training (practice to the passing score), and overtraining (practice to mastery level). Participants were then trained by a blinded educator in ICS. The ICS learning curves were analyzed by estimating the learning plateau and learning rate using nonlinear regression. Skill retention was assessed by retesting participants one month after completing ICS training. The groups were compared using ANOVA. Skill transfer was assessed using the Transfer Effectiveness Ratio (TER), relating time needed to learn ICS to time invested in PT practice. Data are mean (SD).

Seventy-seven participants completed the study: 28 controls, 26 standard and 23 overtrained. ICS learning plateau rose with increasing PT training (452(10) vs. 459(10) vs. 467(10), p<0.01). There was a trend toward higher initial ICS scores (128(107) vs. 127(110) vs. 183(106), p=0.13) and faster learning rates (15(4) vs. 14(4) vs. 13(4) trials, p=0.10) with increasing PT training. Overtrained participants saved 11(5) minutes in ICS training compared to controls (p=0.04), but the overtraining TER was 0.165, suggesting that PT overtraining took longer than the time saved on ICS training.

In surgically naïve subjects, part-task training with PT alone was associated with slight improvements in the learning curve for ICS. However, overtraining with PT did not improve skill retention and PT training alone was not an efficient strategy for learning ICS.
Psychometrics of a Behavioral Marking System for Obstetrical Teams
Morgan, Pam (Sunnybrook Health Sciences Center, Toronto, ON, CAN); Tregunno, Deborah (York University, Toronto, ON, CAN); Pittini, Richard (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); Tarshis, Jordan (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); Regehr, Glenn (Centre for Health Education Scholarship, Vancouver, BC, CAN); Haley, Michele (University of Toronto, Toronto, ON, CAN); DeSousa, Susan (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); Kurrek, Matt (Anaesthesia, Toronto, ON, CAN); Ryzynski, Agnes (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); Milne, Ken (Salus Global Corporation, London, ON, CAN)

This study investigated the internal consistency and reliability of two newly developed tools to assess obstetrical team performance. Obstetricians, anesthesiologists, family doctors and labour nurses from 6 hospitals were invited to participate. Each team participated in 3 sessions separated by 5-9 months where they managed 4 high-fidelity obstetric simulation scenarios involving critical events. Two tools, developed in a previous study, the Assessment of Obstetric Team Performance (AOTP) and a Global Assessment of Obstetric Team Performance (GAOTP) were used (1). Eight trained reviewers watched the DVDs of all teams' performances and rated them using the AOTP and GAOTP. Across the 1088 completed evaluations the Cronbach's alpha for the 16 item AOTP was .96, and .91 for the 6-item GAOTP. Correlation between the two scales was 0.97; when treated as a single 22-item rating scale, the alpha was 0.97 suggesting the measurement of a single dimension (overall performance). The 8-rater alpha for the GAOTP was .81 (single-rater intra-class correlation coefficient, 0.34) indicating acceptable inter-rater reliability with 8 raters. The 4-station alpha for the 12 teams was .79 for session 1, .88 for session 2, and .86 for session 3, suggesting that performance is not strongly affected by scenario specificity. Pearson's correlation of team performance scores from session 1 to session 2 for the four scenarios were: .59, .35, .40, and .33 and for the total score across scenarios .47 indicating moderate test-retest reliability. We conclude that the GAOTP, used by at least 8 raters, would be a sufficient assessment tool for obstetrical team performance using simulation.

References: (1) Tregunno D et al. Qual Saf Health Care 2009; 18: 393-6
From Bench to Bedside: Effective Knowledge Translation with Incorporation of a Novel Debriefing Tool into the New 2011 PALS Instructor Manual and Course

Cheng, Adam (Alberta Children's Hospital, KidSIM-ASPIRE Simulation Program, Calgary, AB, CAN); Eppich, Walter (Division of Emergency Medicine, Children's Memorial Hospital, Chicago, USA); Nelson, Kristen (Division of Critical Care Medicine, Johns Hopkins Children’s Hospital, Baltimore, USA); Hunt, Elizabeth (Division of Critical Care Medicine, Johns Hopkins Children’s Hospital, Baltimore, USA)

The objective of our project was to develop the new debriefing tool for the American Heart Association (AHA) Pediatric Advanced Life Support (PALS) Instructor Manual. This new tool is designed to standardize debriefing methodology amongst PALS instructors. Recent work done by the EXPRESS (Examining Pediatric Resuscitation Education using Simulation and Scripting) Collaborative demonstrated that scripted debriefing was effective at increasing acquisition of knowledge and team leader behavioural skills compared with non-scripted debriefing in novice instructors. However, EXPRESS debriefing script was long, cumbersome, and had limited generalizability. After conducting a review of the EXPRESS script and discussing its pros and cons, the AHA Pediatric Subcommittee gathered to develop a debriefing tool for the new 2011 PALS course. This new tool incorporated the AHA’s Gather-Analyze-Summarize (GAS) model of debriefing. After development, the debriefing tool was pilot tested at BC Children’s Hospital (Vancouver, Canada) during regularly scheduled simulation sessions, with a final set of revisions from members of the AHA Pediatric Subcommittee. The final product incorporates the best elements of the EXPRESS debriefing script: the framework, layout, pattern of questioning, and color scheme. In order to shorten the script down to 1 page, we eliminated the pre-set learning objectives, and questions were modified to be question stems only, providing the instructor with freedom to add in content based on his own observations and judgments. This approach will enhance the fluidity and relevance of discussion during debriefing. After review and pilot testing, the new AHA debriefing tool has been included in the new 2011 AHA PALS instructor manual and course.
We developed, implemented, and evaluated an inter-professional resuscitation competition with the purpose of stimulating health care providers to practice resuscitation skills and foster strong team-based attitudes.

An inter-professional high fidelity simulation-based resuscitation competition was developed at Queen’s University in January 2010. 4-member teams were composed of a mix of nurses, respiratory therapists, undergraduate and postgraduate medical trainees. Teams completed three standardized resuscitation scenarios in a high-fidelity simulation lab. Judges used standardized assessment tools with measures of clinical decision-making, team communication, leadership, and a global assessment. The three highest scoring teams advanced to the ‘Championship’ round which was held in front of an audience and offered a significant cash prize. Participant attitudes towards the competitive event were evaluated using short-answer questions and Likert rating scales.

Ten 4-member teams (n=40) participated in the competition in June 2010. The teams were comprised of: 24 postgraduate trainees from the specialties of Emergency Medicine, Internal Medicine, Family Medicine, and Psychiatry; 7 undergraduate medical students; 6 nurses; and 3 respiratory therapists. Completed questionnaires were received for 36 (90%) participants. Evaluations were uniformly positive in short-answer feedback and attitudinal scoring measures.

The first year of the Simulation Olympics was successful at motivating participants to practice and perform in multidisciplinary teams. The project will be expanded to develop a more comprehensive team training program at our center with increased multidisciplinary involvement.
The degree to which team members share common knowledge, about team members' roles and responsibilities is critically related to team coordination and effective team performance (Orasanu, 2005; Salas, Sims, & Burke, 2005). However, few medical simulations target cognitive skills such as team knowledge, otherwise known as Shared Mental Models (SMMs). A questionnaire was developed to address issues pertaining to SMMs in a team-based simulated training. The degree of agreement or overlap between team members’ interpretations about the simulation and team members’ roles was assessed among 8 multidisciplinary teams using a 5-point Likert scale (5 = strongly agree, 1 = strongly disagree). 4 instructors assessed team performance based on Crisis Resources Management Criteria and categorized team performance using a Likert scale, from very good performance to very poor performance. The team rated by the instructors as having very good performance consistently had higher levels of agreement or overlapping answers (94.4%). Whereas, the team rated with poor performance had considerably less agreement among team member’s answers (66.7%). Qualitative analysis of the simulation of the team with very good performance showed that, assignation and re-affirmation of roles before and during the simulation were essential for developing common knowledge about each team member’s role and responsibilities. The leader’s actions helped members recognize the interdependency of roles, thus leading to better team performance and avoidance of overlapping actions. We argue that SMMs lead to effective team performance and enhanced leadership. Future team simulation research and instruction should consider interventions for fostering SMMs as a method of improving team effectiveness.
POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-5
Learn to be Safe: A Simulation Learning Experience
Thompson, Laurie (Manitoba Institute for Patient Safety, Winnipeg, MB, CAN); Doggett, Murray (Canadian Patient Safety Institute, Edmonton, AB, CAN); Lessard-Friesen, Susan (Manitoba Pharmaceutical Association, Winnipeg, MB, CAN)

The Manitoba Institute for Patient Safety (MIPS) has developed a resource for simulation learning experiences focused on enhancing collaborative patient/family centered care and improving patient safety. Ineffective communication and teamwork among interprofessional groups of healthcare providers have been identified as significant patient safety issues. Including patients and families with caregivers as part of the healthcare team greatly increases patient satisfaction, improves care and reduces the potential for patient harm.

Transitions in care and disclosure of harm represent two areas where significant opportunity exists to improve patient safety through effective communication and teamwork. Evidence supports that the best way for multidisciplinary groups of healthcare professionals to learn to communicate and work together better as a team is through interprofessional education (IPE). Providing IPE within a simulated learning experience may comprise the ideal learning environment to enhance collaborative patient/family centered care and improve patient safety.

In response, MIPS developed Learn to be Safe: A Simulation Learning Experience. Case simulations have been packaged within a kit to facilitate a learning experience for multidisciplinary groups (students and practitioners) that is highly customizable and fun. This innovative learning tool includes a Primer on Patient Safety, Leader’s Guide, Scenario Guides including character briefings and a Learner’s Workbook. Learning objectives are mapped to the Canadian Patient Safety Institute’s Safety Competencies, the Canadian Interprofessional Health Collaborative National Competency Framework and Accreditation Canada’s Required Organizational Practices.
Use of On-Site High-Fidelity Simulation to Improve Pediatric Resuscitation Teams – A National Environmental Scan (a work in progress)
Bhanji, Farhan (Montréal Children’s Hospital, Montréal, QC, CAN); Shuster, Michael (Mineral Springs Hospital, Banff, CAN); Travers, Andrew (Dalhousie University, Halifax, CAN); de Caen, Allan (Stollery Children’s Hospital and University of Alberta, Edmonton, CAN)

Pediatric cardiac arrests occur infrequently (even in tertiary-care centres), are most commonly asphyxial in origin (i.e. secondary to untreated respiratory failure or shock) and are often ‘preventable’. Education of healthcare providers on early recognition and the initial management of pediatric patients with potentially life-threatening disease should be a fundamental requirement for hospitals caring for pediatric in-patients, as should Continuous Quality Improvement measures to ensure appropriate systems and delivery of care.

Objective: Conduct a telephone survey of all tertiary-care pediatric hospital CPR committee chairs to determine ‘current practice’ of resuscitation across Canada.

Methods: The pediatric CPR committee chair, their assigned delegate or the pediatric representative to an ‘adult-based’, university-wide, CPR committee at each Canadian tertiary-care centre (n=16) was approached to participate in a telephone survey. Participants were asked if their centre used on-site high-fidelity simulation for team training and if hospital-wide mock codes were used as part of Continuous Quality Improvement.

Results: To date we have interviewed representatives from 15/16 institutions. Ten out of 15 centres use mock-codes as part of their Continuous Quality Improvement and 10 centres have on-site high-fidelity simulation. Two other centres have high-fidelity simulation adjacent to the Children’s Hospital (as part of the medical school or health sciences building) and 3 centres do not use on-site high-fidelity simulation.

Conclusion: This environmental scan suggests there is moderate uptake of in-situ mock codes and high-fidelity simulation but that there may still be room to optimize training at some centres.
Team Training in Introduction to Clerkship Course using Simulation

Smith, Andrew (Memorial University of Newfoundland, St. John’s, NL, CAN); Harris, Jennifer (Memorial University of Newfoundland, St. John’s, NL, CAN); Boone, Darrell (Memorial University of Newfoundland, St. John’s, NL, CAN); Hapgood, Joanne (Memorial University of Newfoundland, St. John’s, NL, CAN); Drover, Anne (Memorial University of Newfoundland, St. John’s, NL, CAN)

The purpose of a Clerkship Preparation course is to ready the medical student for the transition from pre-clinical to clinical practice. Clinical Clerks are often on the frontline in critical situations. They must be adequately prepared both emotionally and intellectually for their role in emergent patient care. It is felt that the earlier team training and patient safety concepts are introduced into clinical education, the more effectively they are brought into practice.

Most medical schools have clerkship transition courses which cover new information such as order writing, charting and procedural skills. Canadian research has shown that clerkship directors feel students are inadequately prepared for skills such as time management, focused assessments, problem list and dealing with team conflict. Recommendations have been to incorporate these concepts into active learning modes.

Simulation was introduced into Memorial University’s Introduction to Clerkship course for concepts such as “first responder care”, focused information gathering, prioritizing care, effective communication (SBAR) and crisis resource management. These innovative sessions were: Introduction to Airway, Crash Cart -101, First Five Minutes, Trauma Simulation, Approach to Critical Clinical Situations, and Professionalism.

Upon evaluation of the course, student satisfaction ratings increased from 3.4 / 5 to 4.2 / 5 from the previous year with student comments suggesting that this form of simulated team-based learning was both highly preferred and highly effective.

We will present an overview of the course along with a summary of each simulation module. Objectives and evaluations from the students will be provided so that educators can introduce similar sessions into their own Clerkship Transition course.
**POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE**

**P-8**  
Expecting the Unexpected: Exposing Latent Threats During in situ Simulation.  
*Brisbin, Ken (Alberta Health Services, Edmonton, AB, CAN); Brooks, Sherry (Alberta Health Services, Edmonton, AB, CAN)*

**Objective:** During in situ scenarios a number of latent threats dealing with equipment and processes have been uncovered which, if not discovered during simulation, may have caused harm or significant delays in treatment.

**Methods:** Every two weeks, a Clinical Educator from the GSICU and an eSIM consultant set up a clinical situation with a participating unit in the hospital that will require Code Team activation. The Simulator is covertly set up and the unit staff is made aware of the clinical situation. All actions are autonomous by the responders, with the expectation that they will utilize their own equipment and adhere to local policies and procedures. The Educator and Simulation Consultant then adjust the physiological trajectories and situation based on the participants’ actions. When the scenario objectives are met, the simulation is halted and a debriefing is conducted.

**Results:** Although minor issues come up during each scenario, three have resulted in major changes in equipment procedures and system responses. Participants delivered energy intended for the simulator into a pre-connected test load. Participants did not deliver oxygen as a closed auxiliary source on a portable oxygen tank was inadvertently selected. Also, priority elevators were not functional and alternate responses were not adhered to, causing significant delay in code team response. All of these issues have since been addressed through administrative actions and education.

**Conclusion:** Simulation has proven to be a valuable tool in exposing latent threats to patient safety.
**P-9**
Improving Care for Children in Rural and Regional Centres: The KidSIM Interprofessional Outreach Program

Grant, Vincent (KidSIM - ASPIRE Pediatric Simulation Research Program, Calgary, AB, CAN); Lomas, Kate (KidSIM Pediatric Simulation Program, Calgary, AB, CAN); Robinson, Traci (KidSIM Pediatric Simulation Program, Calgary, AB, CAN)

The objectives of the KidSIM Interprofessional Outreach Program are: to provide pediatric interprofessional simulation-based education to all rural and regional healthcare providers in Southern Alberta and Southeastern British Columbia; to provide this education in situ in their actual care environments, with their own teams and their own resources; to identify areas of personal, team and system improvement for each of the care providers and their sites. Development included: gauging learner and site interest, performing a needs assessment, designing realistic objectives and scenarios, recruiting a positive team for education delivery, performing evaluations and refreshing the needs assessment regularly. The program focuses on three main components: 1) a didactic but interactive session provided via telehealth while the outreach team travels and sets up; 2) a hands-on workshop to cover specific identified learning needs (e.g. difficult airway management, rapid sequence intubation, vascular access including difficult IV access and IO insertion); 3) a 4 year rotating simulation curriculum with 12 common and important pediatric scenarios. Annually, the KidSIM Interprofessional Outreach Program visits 15-20 rural and regional centres, teaching approximately 400 healthcare providers each year (73% nurses, 25% physicians and 1% respiratory therapists and EMS providers respectively where they are available). Review of learner evaluations reveals consistent positive feedback about the importance of the interprofessional nature of these sessions, including a greater understanding and appreciation for each team member’s role and abilities, as well as the sharing of references and guidelines being used at the tertiary care centre.

**P-10**
Welcome to the Real World! Or Almost… with the McSeal

Valois, Teresa (Montreal Children’s Hospital, Montreal, QC, CAN)

Medical simulation includes a variety of methods, such as high-fidelity (Hi-Fi) simulation and the use of standardized patients (SPs). In order to address locally identified gaps for non-anesthesiologists, we developed a sedation course that includes, modules on: getting consent, providing sedation and breaking bad news. The use of SPs as a teaching tool for communication skills has become widely adopted, however educational opportunities are often isolated and not completely embedded in the “big picture” scenario. While allowing practice, isolated SP experiences do not always mimic the complexity of a real clinical situation. Furthermore, there is a scarcity of tools in health care professional education that provide opportunities to develop the necessary coping skills in the face of bad outcomes. From the SPs point of view, the process of getting into character as well as sustaining the character is fragmented, preventing them from experiencing the case scenario contextually. We decided to merge both SPs and Hi-Fi into one coordinated scenario: “McSeal” Concatenated Simulation EnhAnced Learning tool. The structure is as follows: Participants conduct a pre-sedation assessment of a pediatric patient and family, and then will provide sedation to a high-fidelity mannequin. Following an adverse event, they have to break bad news to the parents. After the scenario, the SPs and instructors provided feedback to the participant. Learners conveyed that the experience allowed them to reflect on their performance under stress and develop coping skills for their future practice. From the standardized patients point of view, sustaining the character allowed them to provide a more credible and realistic feedback, therefore enriching the learning experience.
P-13
Drama in Trauma
Rickeard, Debbie (University of Windsor, Windsor, ON, CAN); Bornais, Judy (University of Windsor, Windsor, ON, CAN)

High-quality treatment of emergency patients requires optimal team function with respect to leadership, communication, and cooperation. In the context of trauma management, there is evidence to suggest that an effective team response improves patient care, reduces clinical error, and improves patient outcome. A preferred educational method for this type of training is simulation. However, this form of education to evaluate clinical decision making is not routinely used in the hospital setting. The use of simulation allows students to experience situations in a safe environment where they can develop and refine their skills without compromising the safety of real patients.

This poster presentation, will describe three trauma scenarios that involved interprofessional education. The scenarios were in the High Fidelity Simulation Center at the University of Windsor. This was part of a Trauma Conference that took place in collaboration with a Community Hospital. In the development of the scenarios EMS, medicine, and nursing were involved.

Participants in the scenarios included physicians, residents, medical students, nurses, nursing students, respiratory therapists and EMS. Following didactic presentations, they were divided into teams and assigned roles for each scenario. Their roles in the scenario were not their professional roles. The scenarios included a pediatric head injury, an inhalation burn victim, and a traumatic partial amputation of a leg from a farm accident.

Evaluation of the simulation program showed an appreciation for the multidisciplinary approaches to trauma care. Participants felt the simulation increased their confidence in dealing with traumas and working with the multidisciplinary team.
P-14
The Long and Winding Road to Effective Interprofessional Simulated Learning
Bornais, Judy (University of Windsor, Windsor, ON, CAN); Rickeard, Debbie (University of Windsor, Windsor, ON, CAN)

Interprofessional education through simulation offers a promising approach to preparing future healthcare professionals but like most educational tools it is not flawless. There exists a significant body of literature on the benefits of interprofessional health care education using simulation. Benefits such as: improving assessments and performance, patient safety, communication and teamwork amongst health care professionals are evident. But how exactly do you create effective interprofessional simulation scenarios? There are a number of challenges to be addressed in order to assure the success of interdisciplinary educational endeavours. These challenges may be philosophical and sociological (differences in professional respect and commitment to an interdisciplinary approach), organizational and structural (scheduling and timing difference amongst programs), academic or professional (need for faculty development and finding and training appropriate mentors).

This presentation will begin with a brief overview of the numerous challenges cited in the literature with tangible strategies to overcome them. Sometimes the best advice comes from experience. Having journeyed down the long and winding road of interprofessional simulated learning, we will share the key elements that were implemented to improve simulated learning between pre-clerkship medical students and undergraduate nursing students.

P-15
Hockey Lines to Enhance Group Participation in Team-Based Simulation
Topps, David (Northern Ontario School of Medicine, Calgary, ON, CAN); Ellaway, Rachel (Northern Ontario School of Medicine, Sudbury, ON, CAN); Rose, Fran (Sault College, Sault Ste Marie, ON, CAN); Piper, Janet (Sault College, Sault Ste Marie, ON, CAN)

Many simulation centres and activities face the challenge of time and resource optimization: what to do when there are more learners per group than can be practically engaged in the group activity. Using the metaphor of hockey lines and substitution on-the-fly, we have developed an approach to team-based learning that greatly increases the engagement of learners. The approach reinforces good crew resource management practices and closed loop communications. Players are grouped into sub-teams or lines; as in hockey, lines substitute with no stoppage in the flow of play. Substitutes are required to understand their role and to engage in a smooth transition, with no interruption of key activities during the scenario. Participants in an observing crowd of supporters can be further engaged by heckling suggestions to the playing team, where appropriate. This novel approach has been employed and iteratively refined by several participating organisations in the Northern Ontario Simulation in Healthcare Network (NOSHN). Results from this mixed methodology action research study will be presented, along with resources to help others to deploy this technique.
A Qualitative Study of Simulated Patient (SP) Based Simulation for Collaborative Learning in the Context of Surgical Teams

Tabak, Diana (Standardized Patient Program, University of Toronto, Toronto, ON, CAN)

In 2007 Espin et al conducted a study, Using Simulation to Promote Team-Based Disclosure of Errors, designed to pilot and implement a training program for team-based disclosure of harmful errors. A secondary smaller study was undertaken to develop a deeper understanding of collaborative team learning through simulated patient-based simulation by identifying key issues that foster and constrain learning experientially.

After a preliminary analysis the dataset was narrowed down to three dyads, comprised of surgeon and surgical RN, for a purposive sample reflecting varying degrees of surgical experience, team relationships and simulation activity.

The simulation sessions took place in the participants’ own hospitals. Participants were scheduled after their OR time to tackle two scenarios about error. They were expected to plan and discuss their approach and then speak to the patient (SP). A feedback discussion was held immediately after each scenario.

A qualitative, modified thematic, constant comparative analysis of audio transcripts of the post-intervention individual interviews, video data and video transcripts of team pre-planning, simulations and feedback was used. There were substantial differences in learning foci and needs across teams. The teams showed a range of awareness regarding perceived learnings. Similarities in identity construct and hierarchy were displayed.

Several key fostering influences were identified; particularly the value of pre-briefing activities and constructive feedback. Constraining influences (e.g. lack of foundation in communication skills, issues of hierarchy and crystallized team relationships) were identified. Ideas to address the constraints and foster learning emerged from the analysis.
P-17
Effect of Team Training on Management of Obstetrical Emergencies
Morgan, Pamela (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); Tregunno, Deborah (York University, Toronto, ON, CAN); Pittini, Richard (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); LeBlanc, Vicki (Wilson Centre- University of Toronto, Toronto, ON, CAN); Haley, Michele (Women’s College Hospital, Toronto, ON, CAN); DeSousa, Susan (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); Tarshis, Jordan (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); Kurrek, Matt (University of Toronto Department of Anesthesia, Toronto, ON, CAN); Nadiminti, Shivananda (Women’s College Hospital, Toronto, ON, CAN); Milne, Ken (Salus Global Corporation, London, ON, CAN)

Objective: Breakdowns in communication are considered a leading cause of maternal and perinatal morbidity/mortality. High-fidelity simulation (HFS) may aid in improving patient outcomes. The purpose of this study was to determine whether participation in HFS team training improved clinical outcomes of simulated obstetrical emergencies.

Method: 4 scenarios were developed: 1) urgent Cesarean, general anesthesia, can't intubate/ventilate, pulseless electrical activity; 2) severe pre-eclampsia, urgent Cesarean, pulmonary edema; 3) prolapsed cord, amniotic fluid embolism, asystole and; 4) fetal bradycardia, emergency Cesarean, postpartum hemorrhage. 18 clinical outcomes were defined and validated via the Delphi technique. After REB approval, 12 multidisciplinary teams managed the same 4 scenarios at 3 sessions, 5-9 months apart. A trained, blinded observer, recorded the outcome resolution times. A repeated measures analysis of variance was performed for each outcome measure with session time as the repeated measure.

Results: 34 teams had 136 recorded sessions. 6/18 outcomes demonstrated significant differences over time, of which 3 were considered clinically relevant.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Outcome</th>
<th>Time 1</th>
<th>Time 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Arrest:Compressions PEA</td>
<td>3m 56s</td>
<td>2m 15s</td>
</tr>
<tr>
<td>1</td>
<td>Decision:Delivery</td>
<td>10m 57s</td>
<td>6m 39s</td>
</tr>
<tr>
<td>2</td>
<td>Decision:Delivery</td>
<td>13m 10s</td>
<td>6m 55s</td>
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</tbody>
</table>

This study demonstrated a significant training effect on decision to delivery time. PEA was not easily recognized by teams nor was CPR promptly initiated. There was however, faster onset of starting chest compressions between the 1st and 3rd sessions.

Conclusion: Multidisciplinary team training using HFS may help improve team functioning including ACLS protocol education. A larger sample would help determine whether debriefing influences performance.
P-18
Distance Simulation Modality versus Face-to-Face Simulation Modality in Teamwork Training
Koval, Valentyna (CESEI, UBC, Vancouver, BC, CAN); Popova, Kalina (Department of Anesthesiology, UBC, Vancouver, BC, CAN); Ahmed, Sana (Department of Anesthesiology, UBC, Vancouver, BC, CAN); Kliffer, Paul (Department of Anesthesiology, UBC, Vancouver, BC, CAN); Rupesinghe, Lalitha (Department of Anesthesiology, UBC, Vancouver, BC, CAN); Roston, Christina (Department of Anesthesiology, UBC, Vancouver, BC, CAN); Turnbull, Kenneth (Department of Anesthesiology, UBC, Vancouver, BC, CAN); Nazer, Marjan (CESEI, UBC, Vancouver, CAN); Gladkikh, Rita (CESEI, UBC, Vancouver, BC, CAN); Pachev, George (CESEI, UBC, Vancouver, CAN); Qayumi, Karim (CESEI, UBC, Vancouver, BC, CAN)

This research project was conducted to study the effect of simulation-based education on knowledge and non-technical skills acquisition in distance modality versus face-to-face modality.

One hundred and forty-four 3rd Year UBC medical students at the University of British Columbia (UBC), during their core Anesthesia rotation, were randomly assigned into one of two groups: distance modality or face-to-face modality. Forming eighteen teams of four students each, both groups underwent simulation teamwork training at the Centre of Excellence for Simulation Education and Innovation (CESEI). The training consisted of online modules and simulation sessions. Each session includes two distinct scenarios, each followed by a post simulation debrief. Students’ knowledge and acquisition of non-technical skills were assessed based upon the Anesthetist Non Technical Skills (ANTS) categories and elements. The acquisition of knowledge in each category was assessed by multiple-choice question tests administered pre and post training and measured on an individual level. The non-technical skills acquisition in each category was assessed using a checklist adapted from the ANTS and completed by two blinded, independent observers.

The collected data was described using means, standard deviations and ranges for each group. Results were analyzed with knowledge acquisition and non-technical skills outcomes as the dependent variables for each analysis. The results will be presented and discussed at the conference.

This study aims to be used as a recommendation to adapt new simulation modality for team-based practice. Particularly to identify, plan and implement simulation-based distance learning into the current medical curriculum.
P-19
Interdisciplinary Team Members Value a Low-Fidelity, on-site Pediatric Mock Code Program
Zavalkoff, Samara (Montreal Children’s Hospital, Montreal, QC, CAN); Bhanji, Farhan (Montreal Children’s Hospital and the Centre for Medical Education, McGill University, Montreal, QC, CAN)

Our ‘high-fidelity simulation centre’ remains off-site from our hospital, making it challenging to gather interdisciplinary team members for training (due to logistical issues such as travel and scheduling). We implemented an on-site, low-fidelity (i.e. static manikin) pediatric mock code program and evaluated interdisciplinary team members’ impressions of the program. To minimize barriers to participation the program is based at the Montreal Children’s Hospital during team members’ regular working hours. The program spans 3 weeks and repeats every month. Week 1 focuses on respiratory problems, week 2 on shock and week 3 on arrhythmias. During the codes (10 minutes), instructors provide real-time information at the learners’ request. Participants are instructed to behave, as closely as possible, to how they would in real life by assuming their usual role in patient care. Course instructors facilitate debriefing sessions (30 minutes) following the codes. Both medical and crisis resource management principles are debriefed with emphasis on the later. Learners voluntarily and anonymously assessed the program based on a 5 point Likert Scale: 1 being not useful, 3 being useful and 5 being very useful. From January 2008 until February 2009, 42 residents and 55 nurses and respiratory therapists participating in the program completed course evaluations. The mean Likert score for the overall program was 4.97 and 4.7 from each respective group. The mean Likert scale for the debriefing sessions was 4.67 and 4.87 from each respective group. Residents, nurses and respiratory therapists valued this on-site pediatric mock code program using low-fidelity simulation despite access and exposure to ‘high-fidelity’ simulation training.

P-20
Is “See One, Do One, Teach One” Really Enough?
Gamble, Paul (The Michener Institute, Toronto, ON, CAN); Bandali, Karim (The Michener Institute, Toronto, ON, CAN)

As the importance of inter-professional education and collaboration (IPC) continue to grow, the emphasis on non-cognitive skills as defined by the relational, affective, and moral qualities of health providers are now also recognized as crucial elements of professionalism and effective patient-centered care. Within any healthcare curriculum, the determination of students’ readiness for their clinical practicum involves the measurement of these non-cognitive abilities in addition to the profession-specific competencies. The purpose of this study was to investigate the definition of non-cognitive competencies through a quantitative survey methodology with focus groups that consisted of 24 faculty, 158 clinical educators and 24 students across a number of the applied health programs. Outcomes were analyzed for the expectations, perceptions, and beliefs towards a clinically ready student, while the student participation was examined for critical support needs for clinical readiness. Themes of profession-specific technical skills, communication, professionalism, self-reflection, affective behaviour and other-centeredness were identified by faculty members and clinical educators. Student participants recommended comprehensible performance expectations, transferable skills, and diverse practice opportunities. Clinical readiness in applied health students was characterized by the concurrent possession of the appropriate profession specific skills, innate personal traits and attitudinal attributes. These findings were key to revising the admissions processes to address the required balance of cognitive and non-cognitive competencies and curriculum to clearly defined expectations and ample chances to practice.
Are You Part of the Team? Using Interprofessional Education and Simulation to Strengthen Healthcare Training.
Janes, Carla (Capital District Health Authority, Halifax, NS, CAN); Fagan, Barbara (CDHA, Halifax, CAN); Banfield, Valerie (CDHA, Halifax, CAN); Lackie, Kelly (CDHA, Halifax, NS, CAN)

In health care education, learners are traditionally taught within their individual specific professions. Learners formulate opinions regarding professional roles and often develop stereotypes about the roles of other health care team members. These stereotypes can lead to territorial behaviors within teams that can cause conflict and team ineffectiveness. The risk associated with not recognizing another disciplines’ unique contributions, expertise or perspectives is dysfunctional healthcare teams and can result in ineffective utilization of healthcare resources. Learning with, from and about other professionals provides not only a better understanding of the skills and roles of team members but leads to more effective collaborative interprofessional teams.

Educators from Respiratory Therapy, Anesthesia and Critical Care Nursing collaborated together to design and facilitate an interprofessional simulation lab to enhance role understanding in relation to each others’ skills, training and theory. Through high and low fidelity simulation, learners experienced how interprofessional team collaboration can enhance both individual and team practice and improve patient outcomes. Faculty debriefing and reflection allowed learners to discover relevance in interprofessional practice for future practice situations to improve patient care. The Interprofessional Perception Scale was completed prior to and immediately following the session. Evaluations were conducted to determine the attitudes and perceptions concerning interprofessional learning and working.
Objective: To explore the impact of an online course, a tabletop activity and a multi-player e-simulation activity on health professionals’ surge capacity and interprofessional competency.

Methods: Clinical sites opted for the surge capacity training method that best met their needs. All sites completed an online, workplace-based, interprofessional course in surge capacity. Four sites added a tabletop component and one site added both the tabletop and the e-simulation. A descriptive study was conducted with 72 clinicians at 5 hospitals from a range of sectors and disciplines, using validated, reliable surveys. The surveys measured change in interprofessional and disaster management competencies and learner satisfaction with the different learning modalities.

Results: There was a statistically significant difference in the mean pre and post course surge capacity and interprofessional competency scores (p = .000). Satisfaction scores for all 3 modalities were greater than 75/100, however scores for the in-person tabletop simulation were highest: 87/100. The tabletop and e-sim provided an intense, interprofessional learning experience. The majority of table-top participants agreed that the collaborative environment helped build individual and organizational surge capacity.

Conclusion: The e-Sim was an important innovation developed and tested in this study; very little is known about online drills and disaster preparedness education. This study demonstrates that blended learning approaches, using simulation, can be a convenient, effective way to support both surge capacity and interprofessional competency.
Learning design (LD) is based on the idea that activities that are appropriately structured can enable better learning outcomes for individuals or groups than unstructured or poorly structured activities. LD is rooted in behaviourism and is concerned predominantly about knowledge transfer. LD uses aspects of scaffolding, social learning and multimedia learning to create predetermined sequences of activities.

A similar model exists in current simulation practice, where simulator devices are predefined as scenarios with key events and triggers that move learners through the case while giving them feedback. Similarly standardized patient briefings typically provide a series of cues/triggers to move through the activity. The benefits of this approach are activities that can balance predetermined learning points with emergence and variance in learner performance within the scenario.

This presentation will discuss learning design as a philosophy and set of principles to work creatively with the simulated learning environment and the resources within it along with issues such as usability, accessibility and understandability. The presentation will be based around a common activity framework: design within the simulator (encoded activities); design around the simulator (constructed activities); non-educational design (distal activities); and where activities are omitted from the design to allow for variance and improvisation (emergent activities). A range of tools and techniques will also be discussed, such as the semi-structured learning design template (SSLD) and the SAVOIR simulation integration platforms.
POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-24
Cyberinfrastructure for Simulation Instruction
Ellaway, Rachel (NOSM, Sudbury, ON, CAN); Topps, David (University of Calgary, Calgary, AB, CAN); Lachapelle, Kevin (McGill University, Montréal, QC, CAN); Joy, Aislinn (University College Cork, Cork, IRL)

Cyberinfrastructure is a relatively new concept that refers to something more specific than the network but more general than a tool or a resource. The HSVO Project was funded by CANARIE to develop a Network Enabled Platform as a form of cyberinfrastructure to explore how networked training and simulation resources could be built. The resulting system allowed different simulation devices to be connected, controlled and combined to make better use of those simulators and to allow for new and innovative simulation scenario designs.

This was achieved through a software integration platform called SAVOIR. Scenario design within SAVOIR involves selecting the different simulators to be used and arranging them in sequence along with the rules that connect them. Simulators are connected over a network connection with an interpreter between the generic SAVOIR controls and the device-specific capabilities of different simulators. The resulting cyberinfrastructural platform allows simulators to be integrated and automated in multiple locations as well as in multiple sequences of different devices. Not only can scenarios be loaded and devices started and stopped but data such as vital signs can also be shared between devices.

Not only does this allow simulators to be used in more creative ways it also extends the range and applicability of simulator-based training and assessment to teams that are not collocated or have to work remotely. Integrated simulation for teams can therefore run in ways that more accurately simulate the complexities of multi-site healthcare. This presentation sets out the use of cyberinfrastructure in medical simulation using the HSVO Project as an example.
P-25
New Approaches to Simulation Activity Analysis
Ellaway, Rachel (NOSM, Sudbury, ON, CAN); Topps, David (University of Calgary, Calgary, AB, CAN); Lachapelle, Kevin (McGill University, Montréal, QC, CAN); Joy, Aislinn (University College Cork, Cork, IRL)

The HSVO Project was funded by CANARIE to explore how networked training and simulation resources could be built. A series of 11 multi-site simulation activities connecting 4 learning centres (NOSM, McGill, Ottawa and Cork in Ireland) were run using variations on different network resources. All of the sessions were videoed and baseline data about the participants, and their post session reflections on the system were recorded. A behaviour checklist was developed by reviewing the videos and looking for common elements. Initially a 25 item framework, this was whittled down through multiple revisions to a saturated list of 19 learner and/or tutor behaviours (such as discussion, reflection and problem solving) along with technical events such as interruptions.

Five raters from the project reviewed each video and noted all of the behaviours observed in two-minute intervals. These were coded back to the constructs and compared for inter rater reliability. A series of plots were made of the level of construct expression over the time of the session and compared as including: comparing two groups involved in the same or similar activities; comparing tutor actions for impact on learning behaviours; checking impact of interruptions and disruptions; comparing planned and actual sequences; and looking at densities and ordering of different activities.

The paper will demonstrate the breadth of activity designs possible using integrated simulation as well as the variability in doing so, the preferred design patterns and the interactions between the teachers, learners and simulation technologies used. It will also demonstrate how some issues (such as technical interruptions) are more or less important than others (such as tutor interactions).
Northern Ontario has many challenges arising from its geography, climate and its many languages and cultures. Health professional educators in the region have developed significant capabilities in using simulation for teaching, learning and assessment. However, there are problems in sustaining a critical mass of skilled educators.

Following a number of discussions between different simulation providers the Northern Ontario Simulation for Healthcare Network (NOSHN) was established in 2008. Developed as a grassroots collaborative network with no external funding or other support, NOSHN involved providers exploring ways of sharing resources and ideas and supporting each other across Northern Ontario. The network developed to include all of the colleges and universities involved in health professional education in Northern Ontario along with a growing number of hospitals and other care providers.

Common policies were developed around sharing equipment, scenarios and skills to allow personnel and equipment to be used in different contexts. This involved covering issues such as liability and warranty for damage and how expenses such as transporting equipment between sites would be covered. Benefits from participation in this network include: regular peer communication and sharing of ideas; shared training around simulation skills; the ability as a group to leverage greater influence over simulation vendors and suppliers; and the ability to share scenarios, equipment and staff.

This paper will set out how the network was developed and how it has been sustained, particularly in the absence of funding. It will also describe how different organizations can make a simulation network serve their different needs and interests.
P-27
Trauma Team Simulation Training - A Qualitative Analysis
Cope, Alexandra (Imperial College, London, London, GBR); Tang, Jessica (Imperial College, London, GBR); Kneebone, Roger (Imperial College, London, GBR)

This study aimed to evaluate the face validity and perceived educational benefit of a team-based trauma assessment simulation. A strong need for simulation based training in trauma assessment and management has arisen in the UK due to the creation of major trauma units and centralisation of resources. This has left smaller units infrequently seeing major traumas. In addition, there is an urgent need to adequately train trauma team leaders to manage multi-disciplinary major trauma teams at the major trauma centres. Advanced Trauma Life Support (ATLS) prioritises A, B, C and assumes a lone provider or minimal support team; however within major trauma units multiple personnel assess and manage injuries simultaneously. This study was designed to evaluate the realism and perceived usefulness of a team trauma simulation.

The design of the simulation was based upon observational work in the Emergency Department. It was a hybrid simulation involving an actor as a simulated patient, highly realistic silicone wounds and changeable physical parameter monitoring. Participants in the study were Emergency Department attendings and trainees. Video and audio recordings of the simulation were made. All participants took part in a semi-structured interview after the simulation.

We report preliminary data. Major themes were the usefulness of team based simulation when preparing for in-hospital care compared with the ATLS lone provider model. The simulation was highly realistic and provided multiple opportunities for key decision making and leadership training. Feedback was an essential and highly valued part of the simulation training.

Team simulation training for trauma appears to have face validity and is regarded as highly useful in particular for trauma team leader training.
P-28
High Fidelity Simulation to Complement Training in Pediatric Emergency Medicine

Bhanji, Farhan (Montréal Children’s Hospital, Montréal, QC, CAN); Stewart, Jessica (Montreal Children’s Hospital, Montreal, CAN); Bank, Ilana (Centre for Medical Education, McGill University, Montreal, CAN)

Residents feel unprepared to lead the resuscitation of pediatric patients with life-threatening cardiorespiratory dysfunction. Opportunities to learn in the clinical environment are limited yet residents are expected to graduate with these important skills.

We aimed to determine if learners’ perceived ability to manage pediatric resuscitation improved by taking our workshop.

Residents undertaking a 4-week Pediatric Emergency Medicine rotation at the Montreal Children’s Hospital between August 2010 and April 2011 participated in a formative 2-hour high fidelity simulation workshop, focusing on crisis resource management. This was complemented by three 1-hour low-fidelity mock code sessions during the rotation - with the use of summative, objectives-based, short answer pre-tests to maximize learning.

Residents were asked to complete an anonymous short questionnaire focusing on their impressions of the learning experience immediately following a high fidelity simulation workshop. Statements on the survey allowed responses of ‘completely agree’, ‘agree’, ‘uncertain’, ‘disagree’ or ‘completely disagree’.

87 learners undertook the workshop and completed the questionnaire. All subjects believed the workshop was a positive learning experience (86 learners completely agreed and 11 agreed). More importantly, 75 learners completely agreed, and 22 agreed that they were better prepared to address a similar scenario in the ER (no learner disagreed with the statement).

High fidelity simulation workshops can improve learners’ perceived ability to deal with similar scenarios in the clinical setting.
P-29
Innovative In Situ Simulation and Educational Program to Improve Teamwork in Regional STEMI Systems
Hall, Laura Lee (American College of Cardiology, Washington, DC, USA); Beaudin-Seiler, Beth (Western Michigan University School of Aviation, Battle Creek, MI, USA); Dalski, Chet (Kellogg Community College EMS Program, Battle Creek, MI, USA); Wright, Melanie (Duke University Human Simulation and Patient Safety Center, Raleigh-Durham, NC, USA)

Prompt reperfusion in ST-elevation myocardial infarction (STEMI) is critical to prevent mortality and morbidity. Primary PCI is established as the optimal reperfusion therapy, if delivered in a timely fashion at experienced, high-volume centers. However, most STEMI patients are not brought to PCI facilities and fail to receive reperfusion within the critical time period. Transfer of patients requires coordinated processes and communications among and between multiple, multidisciplinary healthcare teams from one or more emergency medical services (EMS) teams, the transferring hospital emergency department (ED), and the ED and cardiac catheterization laboratory (cath lab) of the primary PCI hospital. In this innovative program, the interactions of healthcare providers were filmed from first medical contact with a patient actor through transport, and ED and cath lab treatment, where an endovascular simulator was introduced. A teamwork expert also monitored the simulation. An educational debriefing, led by a cardiologist expert in STEMI systems and team-based care expert, was conducted using selected video segments illustrating potential opportunities for improvement. Interactivity and collaborative problem-solving was emphasized in the debriefing. The development and implementation of this program will be reviewed along with requirements for and evidence of success.
The Role of Leadership in Establishing Mutual Trust and Team Coordination

Cruz-Panesso, Ilian (McGill University, Montreal, QC, CAN); Lachapelle, Kevin (McGill University- Simulation Centre, Montreal, QC, CAN); Lajoie, Susanne (McGill University, Montreal, QC, CAN)

This qualitative study examines the role of medical team leadership in building mutual trust and coordinated behaviors among interdisciplinary members that perform uncertain and interdependent tasks. An in-depth analysis of two interdisciplinary trauma team simulations was conducted with the purpose of identifying leadership behaviors that enhanced or reduced the development of mutual trust and coordinated actions. Team 1 and 2 were rated as having very good or poor performance, respectively, by 4 instructors using crisis resource management criteria. Coordination was measured in terms of unsolicited information provided to other team members and overall reduction in overt communication. The results show that leadership behaviors of Team 1 included active information gathering and interpretation of the mechanism of injury, explicit assignation of roles before and during the simulation, verification of actions demanded, communication of relevant information in an unsolicited base by all team members, leader’s hands-off and maintenance of a frontal position with visual control. In contrast, leadership behaviors of Team 2 were characterized by open-ended demands, fixation errors, cross-checking done by other team members, neglected feedback and integration of information, loss of control as demonstrated by hands-on behavior which resulted in the emergence of a second leader who threatened the legitimacy of the assigned leader. Lack of leadership behaviors constrained the flow of communication, limiting opportunities for creating a climate of trust among team members and increasing of overt communication, hence decreasing coordination. These results highlight the importance of developing specific leadership training for ensuring trust and coordination among team members.
Effects of the level of clinical supervision on team resuscitation and resident learning during simulated ICU scenarios:

Piquette, Dominique (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); Fowler, Rob (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); Regehr, Glenn (Center for Education Scholarship, UBC, Toronto, ON, CAN); Dale, Craig (Sunnybrook Health Sciences Centre, Toronto, ON, CAN); LeBlanc, Vicki (Wilson Centre, Toronto, ON, CAN)

This study explored the relationships between level of clinical supervision during simulated acute resuscitation and resident learning, patient outcomes, and team outcomes. Residents were randomized to a distant, immediately available, or direct level of supervision. They completed a simulation scenario under supervision followed by a similar scenario without supervision. Resident learning was assessed by two independent raters who scored residents' unsupervised performance using a global rating score (GRS) and a checklist. Patient outcomes included 'time to correct abnormal vital signs' and 'definitive management'. Team outcomes included nurses' level of satisfaction and diagnostic accuracy during supervised scenarios.

Fifty-three residents, 24 supervising ICU fellows, and 25 ICU nurses were recruited. During the supervised scenarios, distantly-supervised residents had lower checklist scores compared with immediately-available and direct levels of supervision (61% vs. 77% vs. 72%; p<0.01). Patient and team outcomes were equivalent across the 3 levels of supervision. During the unsupervised scenarios, neither resident performance (mean GRS 4.13 vs. 4.5 vs. 4.17; p=0.53; mean checklist score 65% vs. 73% vs. 68%; p=0.11) nor patient outcomes were different between groups. Predictors of resident performance during unsupervised scenarios included resident level of training (p=0.03), checklist scores (p<0.01) and percentage of tasks completed by residents (p=0.001) during the supervised scenarios, but not the level of supervision (p>0.34).

Direct level of supervision may improve immediate patient care. However, higher percentage of tasks completed by residents during supervised scenario was associated with distant level of supervision and better subsequent unsupervised performance.
The Effects of Operating Room Team Dynamics on Trainee’s Ability to Challenge Authority: Measuring Health Advocacy with Patient Simulation

Sydor, Devin (Department of Anesthesiology, The Ottawa Hospital, University of Ottawa, Kingston, ON, CAN); Bould, M Dylan (Department of Anesthesiology, Children’s Hospital of Eastern Ontario, University of Ottawa, Ottawa, ON, CAN); Naik, Viren N (Department of Anesthesiology, The Ottawa Hospital, University of Ottawa, Ottawa, ON, CAN); Burjorjee, Jessica E (Department of Anesthesiology and Perioperative Medicine, Kingston General Hospital, Queen’s University, Kingston, ON, CAN); Arzola, Christian (Department of Anesthesiology, Mt. Sinai Hospital, University of Toronto, Toronto, ON, CAN); Hayter, Megan Alexandra (Department of Anesthesiology, St. Michael’s Hospital, University of Toronto, Toronto, ON, CAN); Friedman, Zeev (Department of Anesthesiology, Mt. Sinai Hospital, University of Toronto, Toronto, ON, CAN)

Background: Operating room (OR) communication is important for team functioning and patient safety. Status asymmetry between team members is a contributor to communication breakdown and a threat to patient safety. We investigated how hierarchy in the OR team influences an anesthesia resident’s ability to challenge an unethical decision by a staff anesthesiologist in a simulated crisis scenario.

Methods: We prospectively randomized 40, postgraduate years (PGY) 2-5, anesthesia residents at the University of Ottawa to a videotaped simulated crisis scenario with a confederate OR team practicing a hierarchical team structure (group H) versus a nonhierarchical team structure (group NH). The scenario allowed residents several opportunities to challenge their staff anesthesiologist administering blood to a Jehovah’s Witness.

Three independent, blinded raters scored the performances using the modified Advocacy-Inquiry Score (AIS). The primary outcome was comparison of the best-responses AIS between groups H vs. NH. Secondary outcomes included comparison of best AIS by PGY and the percentage in each group that checked blood and administered blood.

Results: The AIS did not differ between groups (p=0.883) but significantly improved from PGY 2-5 (p=0.042). The rates of checking blood (70% vs. 90%, p=0.114) and administering blood (65% vs. 60%, p=0.402) were not significantly different between groups.

Discussion: This study did not show any effect of OR team hierarchical structure on residents challenging authority, however the mean best-response AIS were average in quality. The worryingly high rates of blood checking and administration in both groups may reflect lack of training in challenging authority with implications for patient safety.
A case study is presented of an international technology rich learning module that uses a problem based learning video based approach to trigger student learning issues about giving bad news to HIV patients. The role of emotion and culture is explored in this context. Mixed groups of medical students from Canada and Hong Kong work with facilitators from each country. Technology supports PBL through the use of transparent examples of how experts solve cases involving physician-patient communication. Adobe connect supports the international model through synchronous video interaction and shared applications. After the instructional sessions, each student practices giving bad news to standardized patients using video-conferencing tools. Students receive feedback on their physician-patient communication from experts assessing their performance. The case study supports several types of data analyses. Pre-post test measures address students’ motivation and ability to identify the important aspects of physician-patient communication. The instructional discourse will be analyzed for: the type of affective content considered pertinent to each case, cultural differences between Canada and Hong Kong students, and types of instructor facilitation. The practice discourse with standardized patients examines student ability to transfer what they have learned from the instructional models to patient communication skills. We anticipate that medical students will improve their ability to regulate physician-patient communication. Such regulation will include cognitive, metacognitive, and emotional regulation of knowing what to do and when to do it, and knowing how to communicate in a manner that is most appropriate given a set of circumstances.
Learning objectives for the 2-year Pediatric Emergency Medicine (PEM) program have been defined by the Royal College of Physicians and Surgeons of Canada (RCPSC), but the methods to teach core content are left to the discretion of each program. Simulation-based training is used as part of the PEM curriculum at several Canadian fellowship programs but consensus-based learning objectives have never been formally developed at a national level.

We describe the use of the Delphi consensus building process to define the content for simulation-based training within the PEM curriculum.

We amalgamated the PEM core content topics of the RCPSC and American Board of Pediatrics. Three simulation experts reduced the list of 300 topics to 200 by excluding irrelevant material. The starting list of 200 topics was refined by current and immediate-past PEM program directors, and site-specific simulation experts (n=25) participating in the 3-round Delphi process.

Our Delphi process required experts to rate the suitability of simulation as a pedagogical tool for each topic using a 4 point Likert scale. The cumulative results of this first iteration were re-sent to the experts asking them to reconsider their ratings while reflecting on the opinions of the other group members. This process was repeated a second time when consensus was reached.

To our knowledge, this is the first time the Delphi process has been used to build consensus on the core content for a national PEM simulation curriculum.
The Effect of Mental Practice on Crisis Resource Management: A Simulation Study
Afsari, Mahnaz (University of Toronto, St. Michael's Hospital, Toronto, ON, CAN); Boet, Sylvain (University of Toronto, St. Michael's Hospital, Toronto, ON, CAN); Chiu, Michelle (University of Ottawa, Ottawa Civic Hospital, Ottawa, ON, CAN); Riem, Nicole (Kantonsspital Liestal, Liestal, CHE); Sebbane, Moustapha (University of Toronto, St. Michael's Hospital, Toronto, ON, CAN); Hayter, Megan (University of Toronto, St. Michael's Hospital, Toronto, ON, CAN)

Background: Mental practice (MP) or the ‘symbolic rehearsal of physical activity in the absence of any gross muscular movements’ has been used in sport and music to enhance performance. In healthcare, MP has been demonstrated to improve technical skills performance of surgical residents. However, its effect on crisis resource management (CRM) skills has yet to be investigated. This study aimed to investigate the effect of MP on non-technical skills performance during simulated crisis scenarios. We hypothesized that MP would improve performance of non-technical skills for CRM during a simulated crisis.

Methods: Following REB approval, 40 anesthesia residents were recruited. After standardized orientation to the simulated environment, subjects were randomized to either the intervention group who participated in 20 minutes of MP or the control group. The MP group actively rehearsed a MP script which highlighted key CRM elements. The control group was not exposed to MP but had a 20 minute session that consisted of an educational task unrelated to CRM. Subsequently each subject managed a high-fidelity simulated operative crisis. Using the validated ANTS scale, two independent blinded raters evaluated the non-technical skills performance of the participants. A Mann-Whitney test was used to compare the non-technical skills performance between the two groups.

Results: The recorded scenarios are currently under analysis and, if accepted, the results will be presented at the 2011 Simulation Summit meeting.

Conclusion: MP has the potential to be an easily implementable tool at little cost that might improve non-technical skills performance of anesthesia residents. Further studies should determine the effect of MP on actual crisis performance.
Experience with Use of a Pig Model in a Groin Hernia Operation Training in Surgical Education

Carlsen, Charlotte (Aarhus University, Aarhus N, DNK); Lund, Lars (Viborg Hospital, Viborg, DNK); Gaarden, Morten (Viborg Hospital, Viborg, DNK); Lindorff-Larsen, Karen (Aalborg Hospital, Aalborg, DNK); Charles, Peder (Center of Medical Education, Aarhus, DNK)

Background: In the Danish surgical specialist education programme there has been no formal or skills training in groin hernia (Lichtenstein). As part of a PhD we have designed a formal training course in this field involving theory and hands-on training in plastic phantoms as well as in anaesthetized pigs.

Methods: We designed a course for doctors in their first year of specialty training for general surgery. We included a theoretical lesson, a videotaped operation and hands-on training with use of a hernia trainer, a plastic model of a groin hernia. In the afternoon we included training in pigs with congenital hernias in the inguinal region (usually male pigs). This gave us the possibility of supervising and training dissection techniques in real tissue.

Results: Fifteen first year specialty trainees in general surgery have been enrolled in the course so far. All have been very content with the curriculum and especially the possibility of practicing in real tissue and the supervised feedback.

Conclusion: By using an animal model with congenital hernia in the inguinal region we have been able to design a new and relevant course for doctors in specialty training. This course offers the possibility of training in a model that imitates a human groin with relevant dissection of a “real” hernia which gives a good base for a clinical training programme.
A unique partnership among four post-secondary educational institutions and a health service provider was formed to develop, deliver, and evaluate interprofessional educational learning experiences in three different simulation environments. The goal of the partnership was to prepare students to work in a collaborative team environment upon entering the workforce, with a focus on developing interprofessional competencies of communication and role clarification. Scenarios were created that focused on transitions in care and patient safety. Two key aspects of the project were curriculum and faculty development.

Representatives from the partners formed working groups to develop modules in the three simulation learning environments: virtual world, mannequin-based and standardized patients. A storyboard was developed that followed a single patient from a vehicle collision to discharge home, highlighting key transitions in care. One scenario was developed for each simulation environment, based on this storyboard. Instructors from all institutions were trained to debrief the learning experiences focusing on the interprofessional teamwork skills, rather than clinical skills. The modules were delivered over a 2-year period using 2 different methods: students from across the institutions participated together in either a single simulation ‘bootcamps’ or a one day simulation event with 11 scenarios. This presentation provides an overview of the project and the various developmental stages. Results from the evaluation of the simulation-based learning experiences are presented.
POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-40
Development of a Comprehensive Set of Assessment Tools for Evaluation of Procedural Skills in Internal Medicine

Walzak, Alison (Department of Medicine, University of Calgary, Calgary, AB, CAN); Brindle, Mary E. (Department of Surgery, University of Calgary, Calgary, AB, CAN); Schaefer, Jeffrey (Department of Medicine, University of Calgary, Calgary, AB, CAN); Bacchus, Maria (Department of Medicine, University of Calgary, Calgary, AB, CAN); Ma, Irene W. Y. (Department of Medicine, University of Calgary, Calgary, AB, CAN)

As part of a systematic approach to developing a comprehensive set of validated assessment tools for the seven bedside procedures mandated by the Royal College of Physicians and Surgeons of Canada for Internal Medicine, this study aims to validate and determine the reliability of two assessment tools for lumbar puncture (LP).

A twenty-one item checklist was created and revised based on input from an expert panel (N=6, consisting of a neurologist, emergency physician, general internist, adult hematologist, pediatric hematologist, and an anesthesiologist) using the modified Delphi method. Standard setting was completed using the Angoff and Ebel methods. Two trained reviewers independently evaluated 20 videotaped trainee performances using both the checklist and a previously validated Global Rating Scale (GRS).

The intra-class correlation coefficients of each item on the checklist ranged from 0.78 to perfect agreement, with 15 of 21 items demonstrating perfect agreement. Using the GRS, the intra-class correlation coefficients ranged from 0.35 to 0.97. The Cronbach’s alpha for the checklist and GRS were 0.16 and 0.90 respectively. The Angoff method yielded a minimum performance level (MPL) of 65% with poor agreement of competency compared to the GRS (Kappa=0.06; p=0.45), while the Ebel method demonstrated a MPL of 80% and Kappa=0.07 (p=0.64).

In conclusion, the inter-rater reliability was high for both the LP checklist and GRS, while the internal consistency of the checklist was low. There was poor agreement of competency between the MPL using the checklist and GRS. Reasons for the low internal consistency of the checklist and the lack of agreement on competency deserve further study.
POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-44

Death of a Manikin: Adverse Effects on Learning and Mechanisms
Fraser, Kristin (University of Calgary, Calgary, AB, CAN); Huffman, James (University of Calgary, Calgary, AB, CAN); Ma, Irene (University of Calgary, Calgary, AB, CAN); McIlwrick, Joann (University of Calgary, Calgary, AB, CAN); Wright, Bruce (University of Calgary, Calgary, AB, CAN); McLaughlin, Kevin (University of Calgary, Calgary, AB, CAN)

We hypothesized that manikin death during a simulation scenario for final year medical students would increase emotional distress and thereby increase cognitive load; and that this would lead to poorer learning outcomes.

This was a prospective intervention study in which final year medical students attended a simulation session on “Approach to altered level of consciousness (LOC) in a patient with salicylate overdose”. Groups of 5 students were randomly allocated to one of two groups, Death (D) or No Death (ND) of the manikin in the last 3 minutes of the scenario.

Following the debriefing, students completed an assessment of emotional states, based on the circumplex model of emotion and a 9-point Likert scale of cognitive load. The students were examined 3 months later on a simulator during a 10-minute OSCE station dealing with altered LOC as part of their scheduled summative clerkship exam.

A total of 116 students attended the simulation session on Altered LOC and are included in the analysis. Group D students reported being more nervous, upset, sad, and depressed ($p < 0.05$ for all), and had higher cognitive load (7.63 vs. 7.25, $p = 0.03$) than ND students. On the final OSCE examination, ND students were significantly more likely to pass the OSCE station than D students (86.9% vs. 70.9%, $p = 0.03$).

Death of the manikin impaired the medical student’s ability to transfer key information taught in the simulation session. It is likely that emotional distress increases cognitive load to a point past that which is optimal for learning.
POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-42
Perceptions and Experiences of Nursing Students' Learning in High-Fidelity Simulation
Harder, B. Nicole (University of Manitoba, Winnipeg, MB, CAN); Pauline, Pauline (University of Alberta, Edmonton, AB, CAN); Ross, Carolyn (University of Alberta, Edmonton, AB, CAN)

Much of the emerging literature in simulation use is focused on the outcomes of participants engaging in high-fidelity simulation (HFS). This includes performance outcomes evaluated by a variety of means, as well as looking at confidence levels after participating in simulation experiences. Very little has been written that looks at the experiences and perceptions of student learning as they engage in simulation, and what either enhances or impairs student learning in simulation. This presentation will focus on some of the discoveries that were presented in the discussion section of an ethnographic study. Ethical approval was obtained from two large academic institutions prior to the study. A focused ethnography was used to address the purpose of this study: to understand what happens to student learning during HFS from the perspectives of nursing students and nursing educators. The target population included faculty and students familiar with high-fidelity simulation (HFS). The specific research questions that were used to guide this study were:

1. What are faculty and students’ views of the use of HFS on student learning?
2. What is it like to engage in simulated clinical experiences as a student?
3. What is it like to engage in simulated clinical experiences as an instructor?
4. What factors either enhance or impair the simulated experience?

Results: Learning from mistakes? How many is too many? What should the ensemble cast look like? What about the environment? Realism? These are some of the discoveries that will be presented.
POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-43
New Dog, New Tricks: Trends in FLS Performance for Incoming Surgery Residents
Kolozsvari, Nicoleta (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Kaneva, Pepa (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Cao, Jiguo (Department of Statistics and Actuarial Science, Simon Fraser University, Burnaby, BC, CAN); Vassiliou, Melina (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Fried, Gerald (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN); Feldman, Liane (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Innovation, McGill University, Montreal, QC, CAN)

The goal of this study was to determine whether incoming surgery residents have improved fundamental laparoscopic skills compared to those of previous years.

The initial Fundamentals of Laparoscopic Surgery (FLS) performance of first-year residents between 2003 and 2008 were identified from a prospective database. Linear regression was used to determine the effect of incoming year on performance of the five FLS tasks (peg transfer, pattern cut, endoloop placement, suture with extracorporeal knot and, suture with intracorporeal knot) and total score. Statistical significance is defined as p<0.05.

Sixty-five first-year residents were identified from the database. Total FLS score improved over time (r=0.39, p=0.001). Scores for peg transfer did not significantly change, but scores for pattern cutting (r=0.37, p=0.002), endoloop placement (r=0.36, p=0.004), suture with EC (r=0.32, p=0.02) and suture with IC (r=0.26, p=0.03) all significantly improved over the five years.

Baseline fundamental laparoscopic skills for incoming surgery residents appear to have improved over a five year period. While no distinct program based intervention was identified to explain this higher baseline performance, it may be due to greater interface with technology, increased clinical laparoscopic exposure, or the availability of laparoscopic simulation in medical school.
POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-44
A High Fidelity Simulation Model for Beating Heart Surgery Training
Laflamme, Maxime (Montreal Heart Institute, Montréal, QC, CAN); Girard, Alain (Montreal Heart Institute, Montréal, QC, CAN); Cartier, Raymond (Montreal Heart Institute, Montréal, QC, CAN)

Introduction: Teaching surgical skills is classically based on gradual responsibility. In the current era patients are older, frailer and have more co morbidities than decades ago. This impacts the faculty's tolerance for surgical resident autonomy. Using simulation models offer the trainees the opportunity to increase their confidence and surgical skills outside the surgical theatre. We propose a beating heart model to teach technical skills in off-pump coronary artery bypass (OPCAB) surgery.

Methods: Our model consists of an air pressurized expandable silicone simulated heart connected to a modulator to control the strength and frequency of the contraction. Two millimetre diameter rubber tubes are connected to a perfusing system and positioned on the anterior, lateral, and posterior walls of the model simulating the 3 major coronary vessels. The surrogate heart is fixed on a pivot inside the mediastinum and can be bent in different positions reproducing surgical exposures used during OPCAB surgery.

Results: Experts in beating heart surgery confirm the reliability of the model. The three basic movements seen in beating heart surgery (myocardial contraction, pericardial transmission motion related to the lung inflation-deflation cycle and coronary artery stretching during contraction) were reproduced. Perfusing the coronary network raises the level of technical difficulty to what is normally seen in clinical cases. Disposable substitute coronary vessel allows immediate graft patency assessment.

Conclusion: Our simulation model confirms the likelihood of reproducing, ex-vivo, surgical situations. Simulation models should be part of modern surgical program armentarium devoted to perfect trainee’s coaching.
Using Simulation to Train Junior Psychiatry Residents to Work with Agitated Patients: A Pilot Study

Zigman, Daniel (McGill University, Montreal, QC, CAN); Young, Meredith (McGill University, Montreal, QC, CAN); Chalk, Colin (McGill University, Montreal, QC, CAN)

Objective: Psychiatry residents report feeling inadequately trained to work with agitated patients. This article examines the influence of introducing a new simulation based learning intervention on junior psychiatry residents.

Methods: Postgraduate-Year-1 and -2 psychiatry residents were invited to participate in a new 2.5 hour simulation-based learning intervention focused on evaluating and managing agitated patients. Questionnaires consisting of closed- and open-ended questions were used to explore the influence of the activity on resident self assessed knowledge, comfort and competence.

Results: Twelve residents out of a possible 22 participated. They reported increases in self-assessed understanding of safety procedures, causes of agitation, verbal de-escalation and pharmacotherapy (means: 5.1, 5.0, 5.7 and 4.9, respectively; scale: 1 = much worse to 7 = Much better). Pre/post comparison of ratings indicates that residents also reported increases in comfort and perceived competence both evaluating and managing agitated patients following the intervention (main effect of pre- versus post-intervention; \(F(1,10) = 16.53, p < 0.005\)). In open-ended questions, anxiety and lack of experience were common issues mentioned prior to the intervention. Following the training, participants reported improvements in knowledge and skills and reported appreciating feedback. However, some indicated the need for continued practice and suggested that anxiety was still prominent. Residents found the intervention useful.

Conclusions: Simulation may be well suited to teaching residents to work with agitated patients, but more research is needed to determine whether this kind of educational intervention can lead to changes in patient care.
POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-46
Becoming an Educator in Simulation – Current Status and Future Directions
Ng, Elaine (Hospital for Sick Children, Toronto, ON, CAN); Kotsakis, Afrothite (Hospital for Sick Children, Toronto, ON, CAN)

Objective: To determine the impact of the Debriefing Workshop (DW), benchmark current status of simulation education and determine the need for educational interventions.

Methods: Five one-day DWs were held in 2010 for interprofessional groups. Research ethics board approval was obtained. A web-based 20 question survey was sent by email to all the participants at least six months after their attendance. Qualitative and quantitative data were generated using open-ended questions and 5-point Likert scale anchored at both positive and negative ends.

Results: Response rate was 22/26 (84.6%; 9 nurses, 7 respiratory technologists, 5 physicians, 1 simulation coordinator). Simulation was used for teaching by 19/22 (86%) surveyed. More than 85% reported DW had a high to very high impact on their knowledge on debriefing, and on the way they taught with simulation. For >65% it improved the way they communicated and introduced them to new colleagues. Half the participants had successfully implemented a teaching session using simulation. Seventy-seven % indicated use of knowledge and skills from DW in real life events. Time was identified as the main barrier to utilize simulation in education for 71% of those surveyed. Scenarios and debriefing skills were not definite barriers. Themes emerged from the open ended questions revealing a need for advanced and refresher courses and practice opportunities to enhance debriefing skills.

Conclusions: The one-day DW enabled educators to utilize simulation as a teaching tool and debriefing skills have been translated to daily practice. It led to development of new courses and enabled collaboration to foster interprofessional education and networking. The need for continuing education in debriefing was identified.
P-47
Learning to Collaborate Remotely, in Real Time, Through a Platform of Integrated Simulation Devices.
Joy, Aislinn (School of Medicine, University College, Cork, Cork, IRL); Hynes, Helen (Medical Education unit, University College, Cork, Cork, IRL); Ellaway, Rachel (North Ontario School of Medicine, Sudbury, CAN); Topps, David (University of Calgary, Calgary, CAN); Lachapelle, Kevin (McGill Simulation Centre, University of McGill, Montreal, CAN)

The Health Services Virtual Organisation (HSVO) platform is a web-based network of integrated simulation devices, through which scenarios can be built, for the education of healthcare students and staff. From April 2010 to October 2010, third year medical students at University College Cork (Ireland) participated in seven Simulation Challenges with students from three different medical schools (NOSM, McGill, U of O) in Canada.

The analysis of observed activities during these sessions will be described elsewhere. Here we report preliminary results of a qualitative analysis of the learner perspective, as part of ongoing longitudinal follow up, via focus group interviews. Learning styles and approaches as measured by the index of Learning Styles Questionnaire and ASSIST questionnaire respectively were also completed and will be correlated to interview responses (work in progress).

From an affective and learning perspective, mixed cultural teams, telemedicine scenarios where sites had a distinct role, and virtual patient cases with inbuilt feedback mechanisms, were most appreciated. It was felt that real life video footage also added to the authenticity of an experience. A competitive approach to the learning design, between different cultural groups at remote sites, actually reduced collaboration during the simulation exercise, from the Irish students’ perspective. But when this happened, these students actually learned more about and from students in Canadian schools, by comparing differences of approach to the same scenario.

For best collaborative teamwork during remote simulation challenges though, the overwhelming recommendation from this group of students is to mix a cohort of students from each site, to form multicultural teams that can work together.
Simulation-Based Curriculum for Laparoscopic Inguinal Hernia Repair
Kurashima, Yo (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Arnold and Blema Steinberg Medical Simulation Centre, McGill University, Montréal, QC, CAN); Kaneva, Pepa (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Arnold and Blema Steinberg Medical Simulation Centre, McGill University, Montréal, QC, CAN); Feldman, Liane (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Arnold and Blema Steinberg Medical Simulation Centre, McGill University, Montréal, QC, CAN); Fried, Gerard (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Arnold and Blema Steinberg Medical Simulation Centre, McGill University, Montréal, QC, CAN); Vassiliou, Melina (Steinberg-Bernstein Centre for Minimally Invasive Surgery and Arnold and Blema Steinberg Medical Simulation Centre, McGill University, Montréal, QC, CAN)

The purpose of this study is to develop and validate a comprehensive curriculum for the training and evaluation of laparoscopic inguinal hernia repair (LIHR). We developed a tool to measure performance during LIHR called the Global Operative Assessment of Laparoscopic Skills–Groin Hernia (GOALS-GH). GOALS-GH can be used to assess transabdominal preperitoneal (TAPP) or totally extraperitoneal (TEP) repairs. It is a 5-item global-rating scale. We then designed a low-cost physical model: Laparoscopic Inguinal Hernia Simulator (LIHS). LIHS represents accurate anatomic relationships and allows learners to perform each step of LIHR. To evaluate the reliability and validity of these tools, 17 novices and 8 experienced surgeons were assessed by observers, attending surgeons and self in the OR and/or on the simulator using GOALS-GH. To prepare participants, we conducted a hernia course with pre and post tests, and a step-by-step instructional video of the procedure. The inter-rater reliability of GOALS-GH was greater than 0.7 for all raters in the OR and simulator. The internal consistency of GOALS-GH items was 0.97 in the OR and 0.96 in the simulator. The mean GOALS-GH score for experienced surgeons was significantly higher compared to novices in both environments. The correlation between GOALS-GH scores in the OR and the simulator was 0.81 (p< 0.01, n= 12). Thirty-three general surgery residents participated in the hernia course. Their knowledge about LIHR improved after the course. GOALS-GH is a reliable and valid measure of the skills required for LIHR and may be used with the LIHS as an educational tool. Combined with a basic course and instructional video, these tools can be integrated into a comprehensive curriculum that may help to improve the learning curve for LIHR.
P-49
The Academic Half-Day Redesigned - Incorporating Simulation, Promoting CanMEDS and Developing Self-Directed Learners
Di Genova, Tanya (Montreal Children’s Hospital, Montreal, QC, CAN); Valentino, Pamela (Hospital for Sick Children, Toronto, ON, CAN); Gosselin, Richard (Montreal Children’s Hospital, Montreal, QC, CAN); Bhanji, Farhan (Montreal Children’s Hospital, Montreal, QC, CAN)

In 2009-2010, McGill University’s Pediatrics Residency Program revamped its Academic Half-Day based on concerns that included an overemphasis on subspecialty content, exclusive use of didactic lectures and ‘opportunistic’ topics based on interests of ‘volunteer’ instructors. Novel instructional methods included monthly simulation sessions to learn CanMEDS competencies, increased involvement of Residents as Teachers and the implementation of a ‘Systems-based’ Curriculum using Division Directors to determine who should deliver objectives-based content.

A post-implementation on-line survey was sent to all 18 second and third year pediatric residents who had been exposed to both curricula. This survey was designed to determine the impact of the new curriculum on their ability to retain information, acquire CanMEDS competencies of a General Pediatrician, and to assess the effect on their self-directed learning. Responses were recorded on a 5-point Likert scale from strongly disagree to strongly agree.

Fifteen of 18 residents completed the survey (83%). The 'Systems-based' schedule was preferred by all pediatric residents. Seventy-nine percent of the residents agreed that the simulation sessions were useful to learn the CanMEDS competencies and 64% agreed that the new curriculum better supported learning in a clinical setting. Importantly, 64% of Residents voluntarily read more around the topics presented and 71% agreed they better retained the content compared to the ‘old’ curriculum.

Given the survey results, we propose that our comprehensive, systems-based interactive format, with integrated 'CanMEDS simulation' sessions is practical, while allowing a more learner-centered educational experience that may promote the development of life-long learning skills.
ABSTRACTS

POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-50
Simulation-Based Education for the Rehabilitation Professions: A Scoping Review
Yeung, Euson (University of Toronto, Department of Physical Therapy, Toronto, ON, CAN)

Technology plays an important role in health professions education. The literature shows that simulation-based education (SBE) has shaped curriculum, education policy and research in medicine and nursing. To date, little is known about how SBE can benefit the rehabilitation professions. A comprehensive review of what is currently known about simulation research and the use of SBE in the rehabilitation professions will inform program developers and researchers about questions that remain unaddressed. The objectives of this review are to 1) determine the extent, range and nature of SBE in rehabilitation education, and 2) to identify gaps in the literature on the use of SBE in rehabilitation. A scoping review methodology was used to search the published and grey literature in relevant databases, reports, position papers, and abstracts from relevant conference proceedings and networks. Two authors reviewed the list of abstracts against inclusion criteria which were use of simulation, pre- or post-licensure education, and involvement of rehabilitation professionals or students. Included articles were retrieved for full review, data extraction and analysis using Alkin’s Evaluation Theory Tree. Subsequent qualitative content analysis revealed that only 3 types of simulations are being used in rehabilitation education but SBE may have a role beyond that of developing and assessing procedural skills. Although research has examined the effectiveness of SBE in rehabilitation education, its potential to influence processes that address broader curricular goals have yet to be examined in detail. A program evaluation framework is suggested for program developers and researchers to consider as a more holistic approach to addressing educational research gaps in rehabilitation.

P-51
Partnering for Success - Open Doors 2012
Mullins-Richards, Paula (Memorial University of NL, St. John’s, NL, CAN)

Simulation is not simply mannequins. A multidisciplinary approach to include high fidelity simulators, standardized patients, surgical skills, low fidelity simulation and distributive education tools can create a unique environment to attract multiple partners. We all can research templates from any good business school, academic texts or the internet to provide the required contents and processes to create a first rate strategic and business plan for our centres. It is most important to ensure you have identified the stakeholders, forged lasting partnerships both within and outside your institution prior to the preparation of both sets of plans.

Memorial University of NL new Clinical Learning Center will open its doors in 2012 and you bet we are excited! During our presentation you will learn of how our dream of a 15,000 sq ft facility is now our reality - and all of the unique twists and turns along the way. This is a presentation about sharing facilities and resources which are not limited to capital equipment, materials and human resources. Partnering for Success will also explore unique opportunities for funding that would not normally be open.
POSTER PRESENTATIONS – VIGER / FOYER / SALLE DE BALLE

P-52
Making It Real: 3-D Simulation Immersion in Radiation Therapy
Cherryman, Fiona (The Michener Institute, Toronto, ON, CAN); Niblett, Brad (The Michener Institute, Toronto, ON, CAN); Bandali, Karim (The Michener Institute, Toronto, ON, CAN)

Simulation offers bridging opportunities to immerse students safely into clinical scenarios without impacting quality patient care. Radiation Therapists are practitioners who interact equally with patients and technology to deliver specialized oncology care. The Virtual Environment Radiotherapy Training System (VERT) facilitates student learning in an immersive environment through interactions with virtual patients and radiation therapy equipment. The Michener Institute is the first VERT installation site in North America. Students create individualized patient treatment plans using a true clinical system and import them directly into VERT. Although Michener is in the early stages of embedding VERT into the curriculum, initial qualitative data gathered through focus groups has been positive. Preliminary feedback shows faculty incorporated VERT and its enhanced visualization tools for abstract concepts successfully especially for experiential and visual learners. During initial curriculum development, faculty selected and expanded clinical cases into the VERT platform to illustrate key concepts and competencies. Students indicated a preference for this hands-on learning approach over traditional book learning. We anticipate increasing the utilization of the VERT platform throughout the curriculum providing students an interactive risk-free environment to examine clinical concepts, anatomical specifics and achieve competencies. Further research is required to assess impact on student learning with the aim to improve skill acquisition and theory retention and thereby increase setup accuracy and reproducibility ultimately leading to improved patient safety and outcomes.
Simulation in the Canadian Context: Perceptions of Program Directors and University Administrators

LeBlanc, Vicki (Wilson Centre- University of Toronto, Toronto, ON, CAN); Brydges, Ryan (Wilson Centre- University of Toronto, Toronto, ON, CAN); McNaughton, Nancy (Standardized Patient Program - University of Toronto, Toronto, ON, CAN); Piquette, Dominique (Wilson Centre- University of Toronto, Toronto, ON, CAN); Sharma, Bharat (Department of Surgery - University of Toronto, Toronto, ON, CAN); Bould, Dylan (University of Ottawa, Ottawa, ON, CAN)

Objective: Within the context of the FMEC: PG Project, the goal of this study was to explore the practical realities of postgraduate simulation-based education in Canada.

Methods: Seventeen simulation program directors and university administrators were interviewed about their conceptualization of the central tenets of simulation, and how they integrate simulation in the Canadian postgraduate system. Transcripts of semi-structured interviews were analyzed using an iterative inductive thematic approach.

Results: Simulation is perceived as an important and necessary component of postgraduate training, to target skills and behaviours difficult to acquire through traditional training, and to reduce risks to patients. However, for the theoretical advantages of simulation to be fully realized, interviewees called for improvements: 1) Investment in faculty development to improve the uptake and effective use of simulation. 2) Integration of simulation more thoughtfully into existing curricula, and across specialties & modalities. 3) Evolution of research beyond description towards justification and clarification of how to optimally use simulation. There was broad agreement that simulation is ideal for training in an interprofessional context. However, postgraduate simulation-based interprofessional education (IPE) is resource intensive and logistically challenging, with education competing with service commitments. For theoretical advantages of IPE simulation to be realized, interviewees argued for stakeholders to prioritize this form of teaching.

Conclusion: Within Canada, further developments in faculty development, integration, research, and simulation for IPE are advocated to optimize the effectiveness of simulation-based education.
Simulation for Family Centered Care: Improving Caregiver Skills, Self-Efficacy and Quality of Life using a Practice-Until-Perfect Simulation Intervention for Seizure Management in the Home Environment

Sigalet, Elaine (KidSIM-Aspire Pediatric Simulation Research Program, Alberta Children's Hospital, University of CalgaryKIDSIM Program Alberta Children's hospital, Calgary, AB, CAN); Chatfield, Jenn (KidSIM-Aspire Pediatric Simulation Research Program, Alberta Children's Hospital, University of CalgaryKIDSIM Program Alberta Children's hospital, Calgary, AB, CAN); Grant, Vince (KidSIM-Aspire Pediatric Simulation Research Program, Alberta Children's Hospital, University of CalgaryKIDSIM Program Alberta Children's hospital, Calgary, AB, CAN); Koot, Deanna (KidSIM-Aspire Pediatric Simulation Research Program, Alberta Children's Hospital, University of CalgaryKIDSIM Program Alberta Children's hospital, Calgary, AB, CAN); Robinson, Traci (KidSIM-Aspire Pediatric Simulation Research Program, Alberta Children's Hospital, University of CalgaryKIDSIM Program Alberta Children's hospital, Calgary, AB, CAN); Cheng, Adam (Alberta Children's Hospital, KidSIM-ASPIRE Simulation Program, Calgary, AB, CAN)

This study examines the impact of utilizing a novel Family Centered Care focused high fidelity simulation intervention to deliver seizure management teaching on caregiver performance, perceptions of self-efficacy, and quality of life. This intervention will engage practice until perfect ideology congruent with the principles of family centered care doctrine, providing an opportunity for caregivers to practice managing seizures until they verbalize comfort with skills and knowledge. We hypothesize that participants in the intervention group will demonstrate improved performance with emergent seizure management, report greater confidence, and enhanced quality of life compared to participants in the control group who receive traditional discharge education.

An experimental two-group pretest/posttest randomized controlled research study will be used to compare participant responses to both types of curriculum. We will recruit primary caregivers of children with underlying seizure disorders being cared for at the Alberta Children's Hospital. We anticipate a sample size of 98 subjects to support a two-tailed alpha of 0.05, beta of 0.20, resultant power of 80%, predicting a moderate effect size of $\geq 0.40$. The effect size is based on health professional research. This study is a work in progress. Preliminary results are expected January 2012.

To date, simulation-based education has focused primarily on health professionals as learners. Our study aims to assess the impact of a simulation-based intervention in caregivers. We anticipate that our practice-until-perfect simulation-based intervention will demonstrate improved caregiver performance, self-efficacy and quality of life, and thus pave the wave for caregiver-based simulation interventions in other contexts as well.