BOOK OF ABSTRACTS

All abstracts listed in the IPSSW2017 Book of Abstracts have been assigned a prefix for the type of presentation, a number for the session they are running in and a sequential abstract number. The authors’ whose names are marked with an asterisk (*) are the presenting authors.

Abstracts have been divided in 11 topics as follows:
1. Simulation for procedural and psychomotor skills
2. Process improvement and organizational change
3. Innovation/ Future Direction and Outreach Simulation
4. Faculty development
5. Assessment (including use and validation of measurement and assessment tools)
6. Debriefing and teaching methodologies
7. Simulation instruction design and curriculum development
8. Patient safety and quality improvement
9. Educational Outreach (including remote, rural and international simulation education)
10. Crisis Resource Management/Human factors and Teamwork
11. Programme development/ Administration and Programme Management

Hanging and removal of posters

Poster boards will be marked with the final assigned numbers (which differ from the abstract submission numbers).

Poster mounting time: Posters may be hung starting on Wednesday, 31 May, at 2:00 PM. Posters must be mounted prior to Thursday, 1 June at 10:30 AM.

Poster removal time: Posters must be removed by Saturday, 03 June, at 3:30 PM. Posters that have not been removed by 5:30 PM will be disposed of by the organisers.

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Shelly Pignataro, Marilyn Moonan, Lynn Imbaro
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PO 06-5 - IPE Simulation Enhances The Quality Of Care In Neonatal Hyperammonemia
Mostafa A. Elbaba
ID: IPSSW2017-1021

PO 06-6 - Global Implementation Of Certainp To Facilitate The Delivery Of Care To Critically Ill Children
Dipti Padhya, Grace Arteaga, Rahul Kashyap, Sandeep Tripathi, Srinivas Murthy, Mouaz Alsawas, Hongchuan Coville, Yue Dong
ID: IPSSW2017-1255

PO 06-7 - Pediatric Acute Care Course Simulation Based In Guatemala
Luis A. Moya-Barquín
ID: IPSSW2017-1250

PO 07-1 - Systems-Focused Simulation In A Non-Clinical Unit: The New Seattle Children’s Hospital Kitchen
Kimberly Stone, Jennifer Reid, Robin Collier, Jerry Kubej, Taylor Sawyer, Forest Kitchen Simulation Group
ID: IPSSW2017-1223

PO 07-2 - Assessing Picu Mattress Compressibility With Standard Backboard And Real-Time Feedback
Yiqun Lin, Brandi Wan, Claudia Belanger, Elaine Gilfoyle, Adam Cheng
ID: IPSSW2017-1042
PO 07-3 - Improving Pediatric Care Through Simulation (Impact)
Grace Ker, Sandeep Gangadharan
ID: IPSSW2017-1186

PO 07-4 - Human Factors Of Error Investigation: Implementation Of Transferable Skills Simulation Educators
David Grant
ID: IPSSW2017-1052

PO 07-5 - Implementing Just In Time Clinical Resuscitation Training In The Intensive Care Unit
Shekinah Hensley, Beth Kalb, Jay Rilinger, Jenna Miller
ID: IPSSW2017-1231

PO 07-6 - Identifying Latent Patient Safety Threats Using In-Situ Simulation With Multi-Disciplinary Teams At Starship Hospital, New Zealand
Trish Wood, Michael Shepherd, Gabrielle Nuthall, Sarah Jamison and Anna-Marie Grace
ID: IPSSW2017-LS-08

PO 08-1 - Moving To A New Hospital: Two Types Of In-situ Simulation For Or Staff Preparedness
Chantal Hickey, Sandra Lesage, Françoise Yung, Myriam Couture, Caroline Haché, Stephanie Hogue, Hayli Martinez, Andree Sansregret
ID: IPSSW2017-1167

PO 08-2 - Medical Student Perspectives On Relevance Of Mannequin-Based Simulation In Undergraduate Education
Vidushi Pradhan, Xiao Meng Ye, Geiske Zijlstra, Grace Audu, Hena Salam
ID: IPSSW2017-1198

PO 08-3 - Welcome To The College Of Nursing: You've Just Been Simulated
Maureen Hillier, Christine McGrane, Beth Anne Jalbert, Todd Madison
ID: IPSSW2017-1185

PO 08-4 - Using Qualitative Improvement Methods To Improve Neonatal Resuscitation Simulation Based Education
Anne Ades, Shela Siddiqi, Jean Marie Carroll, John Chuo
ID: IPSSW2017-1153

PO 08-5 - Building A Culture Of Simulation In A Paediatric Emergency Department
Jane Cichero, Linda Durojaiye, Nichola Concannon
ID: IPSSW2017-1176

PO 08-6 - Introducing Team Performance In Malawi’s Pediatric Emergency Triage Assessment And Treatment Course
Elaine L. Sigalet, Ian Wishart, Norman Lufesi, Faizal Haji, Adam Dubrowski
ID: IPSSW2017-1058

PO 08-7 - Development Of An Interprofessional Team Training Simulation Curriculum In Pediatric Critical Care
Josephine Lok, Christine Mai, Phoebe Yager, Natan Noviski
ID: IPSSW2017-1204

PO 09-1 - Survey On Medical Students’ Opinion About A Simulation Based Program For Pediatric Emergencies
Feray Guven, Mehmet E. Sayali, Dilek Kitapcioglu, Mehmet E. Aksoy
ID: IPSSW2017-1081

PO 09-2 - Low-Fidelity Medical Simulation In Southwest Alaska: A Needs Assessment
Elizabeth Sanseau, Jennifer Reid, Anita Thomas
ID: IPSSW2017-1054

PO 09-3 - Using Simulation To Identify Latent Safety Threats During Neonatal Intramural MRI Transport
Jonathan Wong, Kaarthigeyan Kalaniti, Michael Castaldo, Kyong-Soon Lee, Hilary Whyte, Manohar Shroff, Douglas M. Campbell
ID: IPSSW2017-LS-07

PO 09-4 - NICU Multidisciplinary CRM Seminars In Graduate Education: Delivery of Difficult Information
Kristen E. Lindamood, Caitlin O’Brien, Kristen T. Leeman, Denise Casey, Tricia Grandinetti, Elizabeth G. Doherty, Christopher Roussin
ID: IPSSW2017-1226

PO 09-5 - Can Self-Assessment Replace Expert Evaluation Done By Faculty Members In Simulation Training?
Mehmet E. Sayali, Feray Güven, Mehmet E. Aksoy, Dilek Kitapcioglu
ID: IPSSW2017-1082
PO 09-6 - Embedding Royal College Of Anaesthetist’s Case Based Discussions Into The MEPAT Course
Scott McNeill, Pamela Winton, Tobias Everett
ID: IPSSW2017-1104

PO 09-7 - Pediatric Simulation Training For Prehospital Providers In Botswana
Nicolaus Glomb, Adeola Kosoko, Cafen Galapi, Molefe Radipudi, Cara Doughty, Manish Shah, Bushe Laba, Marideth Rus
ID: IPSSW2017-1154

PO 10-1 - Developing Paediatric Undergraduate Simulation - A Pilot Project
Richard Levin, Andrew Tester, Caitlin Stewart
ID: IPSSW2017-1044

PO 10-2 - Assessment of a Novel Pediatric Resident Simulation Curriculum
Kyle Schoppel, Louise Maranda, Walter Eppich, Gina M. Trachimowicz, Matthew W. Ryzewski
ID: IPSSW2017-LS-02

PO 10-3 - Procedural Training And Competency Assessment For Pediatric Emergency Medicine Physicians
Rebekah Burns, Neil Uspal
ID: IPSSW2017-1214

PO 10-4 - Nasal-Tragal Length Measurement For Correct Endotracheal Tube Placement In Neonatal Simulators
Megan Gray, Heather Delaney, Rachel Umoren, Thomas Strandjord, Taylor Sawyer
ID: IPSSW2017-1173

PO 10-5 - Simulation-Based Evaluation Of Professionalism Milestones In Pediatric Sub-Specialty Residents
Melissa Smith, Benny L. Joyner, Eva Waller, Rebecca Smith, Sofia Aliaga, Gene Hobbs, Robert Isaak, Kimberly Blasius
ID: IPSSW2017-LS-13

PO 10-6 - Simzones: An Organizational Innovation For Simulation Programs And Centers
Christopher J. Roussin, Mike Shepherd, José M. Quintilí, Peter Weinstock
ID: IPSSW2017-1239

PO 11-1 - Can Simulation Improve Competency Of The New Bedside Nurse?
Roberta L. Hales, Heather Meldrum, Lynn Boyle, Laura Herring
ID: IPSSW2017-1221

PO 11-2 - A High-Fidelity Simulation Boot Camp for Pediatric Cardiac Critical Care Nurse Practitioners
Kristen M. Brown, Elizabeth A. Hunt, Jordan Duval, Kristen Nelson McMillan, Julie Perretta, Shawna S. Mudd
ID: IPSSW2017-1227

PO 11-3 - Summer Camp Mock Codes: Studying Effects On Nursing Self-Efficacy With Medical Emergencies
Jessica Bhullar, Sarah Lawrence, Fuad Alnaji, Shelley Clarke
ID: IPSSW2017-1089

PO 11-4 - The Role Of Simulation In Advancing Undergraduate Nursing And Medical Education
Ben Mcnaughten, Doris Corkin, Pauline Cardwell, Dara O’Donoghue
ID: IPSSW2017-1130

PO 11-5 - Interprofessional Pediatric Hybrid Simulation – Nursing And Medical Students Learning Together
Joanna R. Kuppy, Laura Meltzer, Elizabeth R. Van Opstal, Lynette Richter, Katherine Schafer, Beverley Robin
ID: IPSSW2017-1047

PO 11-6 - In-Situ Simulation For Latent Threat Identification In The Emergency Department
Rana Sharara-Chami, Nicholas Batley, Christelle Tayeh, Zavi Lakissian
ID: IPSSW2017-1119

PO 12-1 - 60 Seconds To Survival: Asynchronous Pediatric Disaster Triage Learning Via A Novel Video Game
Mark X Cicero, Monty Sharma, Ryan Canuel, Travis Whitfill, Marc Auerbach
ID: IPSSW2017-1125

PO 12-2 - NRP: Using Apps To Augment Education
Thaddeus Anderson, Gina Pantone
ID: IPSSW2017-1145
PO 12-3 - Fiction Short Film Developing Process A Tool For Training In Simulation Videos In Guatemala
Luis A. Moya-Barquin, Diana Coronel-Martinez, Javier Corleto, Jose Hernandez
ID: IPSS2017-1257

PO 12-4 - Creating Gold Standard Videos to Teach NRP Skills Stations
Nathan Sundgren, Leigh Ann Cates, Courtney Washington, Leisa McMullen, Jennifer Arnold
ID: IPSS2017-1241

PO 12-5 - Testing a System in Response To a Child Sustaining a Seizure in the Out Patient Clinic
Ella A. Scott, Angela Krizan, Anish Patel, Khalid Al Ansari
ID: IPSS2017-1048

PO 12-6 - An Answer For Simulation On The Go: "Pets"
Gina Pantone, Michael Greenier
ID: IPSS2017-1084

PO 12-7 - Virtual Antenatal Encounter and Standardized Simulation Assessment (VANESSA): A Pilot Study
Patrick Motz, Megan M. Gray, Taylor L. Sawyer, Doug Danforth, Jennifer Kett, YunLun Chou, Rachel Umoren
ID: IPSS2017-LS-04

PO 13-1 - Using Rapid Cycle Deliberate Practice to Improve Resident Performance During Mock Codes
Chrystal Rutledge, Nathan Swinger, J L. Zinkan, Nancy M. Tofil, Stacy Gaither
ID: IPSS2017-1245

PO 13-2 - Debriefing Clinical Events In The Nicu- Train The Debriefier Program
Mona Khattab, Lindsy Nicklaus, Joseph Hagan, Jeniffer Arnold
ID: IPSS2017-1202

PO 13-3 - Effective Communication Training Program In The Pediatric Intensive Care Unit: Primary Results
Veronica Becerra, Juan Carlos Vassallo, Silvia Santos, Florencia P. Villois, Celica Menendez, Daniel Buamscha, Maria Althabe, Alberto Charroqui, Luis Landry, Ricardo Rodriguez, Eugenia Galvan, Roberto Zima, Gustavo Cardini, Susana Rodriguez
ID: IPSS2017-1264

PO 13-4 - Rapid Cycle Deliberate Practice Vs. Traditional Simulation In A Resource-Limited Setting
Samantha Rosman, Rosine Nyirasafari, Elizabeth Camp, Hippolyte B. Muhire, Christian Umuhoza, Marideth C. Russ
ID: IPSS2017-1152

PO 13-5 - Big Lessons For The Little People - Paediatric Simulation In Medical Student Teaching
Christopher Arrowsmith, Catrin Page, Kaj Kamalanathan
ID: IPSS2017-1124

PO 13-6 - Simulation Enriched, Multi-Modality Training In Procedural Sedation For Gastroenterology
Sonya M. Seshadri, Lindsay McMillan, Gee Mei Tan, Norah Janosy, Debra Faulk
ID: IPSS2017-1110

PO 13-7 - "Preparing You": A Complete SIM Service Line For Patients, Families, And Caregivers
Lauren Mednick, Brianna O'Connell, Christopher Roussin, Gena Koufos, Melissa Burke, Catherine Allan, Peter Weinstock
ID: IPSS2017-1184

PO 14-1 - Implementation of the FACT for In Situ Pediatric Trauma: Observing Hospital Care for Head Injury
Chris Kennedy, Ralph MacKinnon
ID: IPSS2017-1236

PO 14-2 - Paramedics Acute Pediatric Patient Based Simulation Training In Guatemala
Luis A. Moya-Barquin
ID: IPSS2017-1258

PO 14-3 - Educational Simulation Based Videos As A Tool For Training In Rural Places In Guatemala
Luis A. Moya-Barquin
ID: PSSW2017-1248
PO 14-4 - Developing An Interprofessional Blended Learning Orientation For A Greenfield Outpatient Center
Elaine L. Sigalet, Dina Schnurman, Guy Brisseau, David Sigalet
ID: IPSSW2017-1196

PO 14-5 - Teamwork And Decision Making Analysis With Educational Simulation Based Videos In Guatemala
Luis A. Moya-Barquin
ID: IPSSW2017-1252

PO 14-6 - High-Fidelity Simulation vs. Educational Video: Impact on Self-Efficacy and NRP Skill Retention
Kyle Schoppel, Louise Maranda, Walter Eppich, Gina M. Trachimowicz, Matthew W. Ryzewski
ID: IPSSW2017-LS-03

PO 14-7 - Turning The Ship Of Worries: Simulating Future Pediatric Care In Preparation For A Hospital Move
Margaretha Lanne, Karin Pukk Hårenstam, Maryann Flörbrant, Satu Selling
ID: IPSSW2017-1225

PO 15-1 - Difficulty Importance Frequency Analysis With Simulation To Maintain Team Competency
Suvradeep Basu, Josephine Whiston, Stephen Hancock
ID: IPSSW2017-1074

Nicholas Schindler, Amy Ruffle
ID: IPSSW2017-1181

PO 15-3 - Using Simulation to Manage Aggression in the Healthcare Setting
Jeffrey H. Stoner, Josh Trewin
ID: IPSSW2017-1253

PO 15-4 - Medical Non-Clinical Simulation
Matthew Taylor, Chris Roussin, Brad McDonald
ID: IPSSW2017-1201

PO 15-5 - A Technology Aid For Performance Assessment In Paediatric Emergency Department In-Situ Simulation
Dilshad Mariar, Jennifer Mann, Gareth Lewis, Damian Roland
ID: IPSSW2017-1046

PO 15-6 - A Descriptive Evaluation Of Clinicians’ Gaze Behaviours During Paediatric Simulated Emergencies
Ben McNaughten, Caroline Hart, Stephen Gallagher, Andrew J. Thompson, Thomas W. Bourke
ID: IPSSW2017-1123

PO 15-7 - Simulated Encounter In Primary Care Clinic
Candice Dye, Nancy Tofil
ID: IPSSW2017-1243

PO 16-1 - A Novel Approach To Increased Fidelity For Neonatal Circumcision
Wendy Van Ittersum, LaDonne O’Connell
ID: IPSSW2017-1078

PO 16-2 - Realistic Simulation-Based Training In Satellite Operating Rooms And Post Anesthesia Care Units
Patricia Dwyer, Linda Bulich, Karen Murphy, Bistra Vlassakova, Leigh Graham, Meghan Casey
ID: IPSSW2017-1195

PO 16-3 - Simulation Curriculum To Evaluate Competency In A Two-Person Neonatal Transport Team
Allison Winchester, Carol Lynn O’Dea
ID: IPSSW2017-1217

PO 16-4 – Engaging Undergraduate Nurses In Simulation Prior To Placement To Enhance Emotional Resilience
Benjamin Low, Elizabeth Akers, Richard Paget, Wahid Chaudhry, Amy Leonard
ID: IPSSW2017-LS-01

PO 16-5 – Simulating The "Scary": Megasim In Picu/Cicu Nursing Orientation
Amber Merritt, Kara Johnson, Heather Walsh, Janice LePlatte, Michelle Desoiza, Ashleigh Harlow
ID: IPSSW2017-LS-15

PO 16-6 - A Prospective Study Of Physician Biometric Measurements Using A Wearable Performance Tracking Device
Rob Parker, Nicholas Siamon
ID: IPSSW2017-1147
PO 16-7 - Simulation For Multidisciplinary Teams Managing Neonates With Complex Cardiac Disease
Redmond, B., Simmons, M., Bruno, C., Ray, J., Johnston, L.
ID: IPSSW2017-LS-09

PO 17-1 - High-Fidelity Simulation in New Pediatric Emergency Department: Employing an After-Action Report
Kelley Sava, Sarah Maciolek
ID: IPSSW2017-LS-10

PO 17-2 - Errors Observed During The Use Of Defibrillator In Simulated Pediatric Patients
Diego Enriquez, Silbina Brizuela, Santiago Di Sipio, Sebastián Figueroa, Claudio Perretta, Angel O. Scapin, Edgardo Szyld
ID: IPSSW2017-LS-11

PO 17-3 - Fatigue During Cardiac Compression Exercise Using Neonatal Patient Simulators
Diego Enriquez, Silbina Brizuela, Santiago Di Sipio, Sebastián Figueroa, Claudio Perretta, Angel O. Scapin, Edgardo Szyld
ID: IPSSW2017-LS-12

PO 17-4 - Creation Of Multi-Disciplinary Simulation To Increase Team Competence And Decrease Time To Ecmo Cannulation
Justine Fortkiewicz, Karthik Ramakrishnan, Leah Arold, Amber Merritt, Kasey Gragg, Olivia Benson, Gary Oldenburg, Greg Yurasek
ID: IPSSW2017-LS-16

PO 17-5 - Maximizing Efficacy Of Simulation-Based Training: Rapid Cycle Deliberate Practice Vs Traditional Simulation
Danelle Dower, Elaine Ng, J. Taras, Tobias Everett
ID: IPSSW2017-LS-26

PO 17-6 - Simulation Based Assessment Of Advanced Airway Cart Placement In A Pediatric Ed
Malika Atmakuri, Jennifer Reid, Kimberly Stone, Sanjay Parikh, Andrew F. Inglis, Kaalan Johnson
ID: IPSSW2017-LS-18

PO 17-7 - Optimizing The Operational Process During In-Situ Simulation Using A Web Based Automated Data Entry System
Mona Khattab, Brian Warwick, Kellie Kainer, Leisa McMullen, Melissa Cashin, Leigh-Ann Cates, Nathan Sundgren, Cara Doughty, Jennifer Arnold
ID: IPSSW2017-LS-19

PO 18-1 - Field Test Of Gps Patient Trackers In A Simulated Mass Casualty Event: A Feasibility Study
Isabel T. Gross, Ryan F Coughlin, David C Cone, Sandy Bogucki, Marc Auerbach, Mark X Cicero
ID: IPSSW2017-LS-20

PO 18-2 - Preparing For Rare Intraoperative Emergencies: Pediatric Massive Transfusion Protocol
Aaron Low, Eva Waller, Kimberly Blasius
ID: IPSSW2017-LS-21

PO 18-3 - Simulation-Based Training For Intermediate Care Level Patients In Pediatrics
Elaine Ng, Adelina Morra, Roger Correia, Zia Bismilla, Intermediate Care Education Group
ID: IPSSW2017-LS-22

PO 18-4 - Standardized Patient Simulation To Develop Communication Skills In Difficult Conversations
Sarah Klein, S. Kaviany, S. Mehta-Patel, V. Havalad, K. Nelson, M. Butterly, P. Notario
ID: IPSSW2017-LS-23

PO 18-5 - A Novel Simulation-Based Ultrasound Curriculum
Vinod Havalad, Joanne Claveria, William Tsai
ID: IPSSW2017-LS-24

PO 18-6 - Tele-Co-Debriefing As An Initial Step For Tele-Curriculum Development For Simulation Faculty In Latvia
Luize Bidina, Isabel T Gross, Marc Auerbach, Reinis Balmaks
ID: IPSSW2017-LS-27

PO 18-7 - Simulation For Workflow Design Of The Automated Medication And Supplies Unit In Pediatric Anesthesia
Elaine Ng, Angela Domingues, Johanna Ysselstine Qadri, Eric Greenwood
ID: IPSSW2017-LS-17
PO 19-1 - Advancing Simulation Facilitation And Debriefing Through Strategic Curricular Integration
Ashley Keilman, Melissa Vitale, Noel Zuckerbraun
ID: IPSSW2017-LS-25

PO 19-2 - Design Evaluation Of A Novel Female Infant Urinary Catheterization Simulation Trainer
Maeva Geary, Jeanne Chow, Jessica Sexton, Peter Weinstock, Professor P. Myler
ID: IPSSW2017-LS-28

PO 19-3 - A Parental Self-Efficacy Tool In Tracheostomy Care: The Development And Validation Of An Instrument
Spencer Pruitt, Jennifer Arnold, Satid Thammastiboon, Lisa Noll, Jorge Coss-Bu, Kevin Roy
ID: IPSSW2017-LS-29

PO 19-4 - 2-Center Collaboration on Debriefer Training for Nurses
Takanari Ikeyama, Yuko Shiima, Hiroshi Kurosawa
ID: IPSSW2017-LS-30

PO 19-5 - A Needs Assessment for a Context Sensitive Pediatric Anesthesia Simulation Curriculum in Sub-Saharan Africa
ID: IPSSW2017-LS-31

PO 19-6 - The Validity of a Global Rating Scale and Checklist for Evaluation of Pediatric Laceration Repair
Neil G. Uspal, Anita A. Thomas, Rebekah A. Burns, Maya A. Jones, Isabel T. Gross, Ryan D. Kearney, Rachel E. Whitney, Julie Uspal, Nancy Gove, Jennifer R. Reid
ID: IPSSW2017-LS-32
WS 01 – Rapid Cycle Deliberate Practice For Interprofessional Teams

Debriefing and teaching methodologies

Submission ID: IPSSW2017-1155

Cara B. Doughty*, 1 Bram Welch-Horan2, Nadia Villarreal3, Natalie Pham3, Charlyn Davis3, Karen Patricia4, Jennifer Arnold4, Marideth Rus1, Daniel Lemke1

1Pediatrics, Baylor College of Medicine, Houston, 2Pediatrics, University of Pennsylvania, Philadelphia, 3Pediatric Emergency Medicine, Texas Children’s Hospital, 4Pediatrics, Neonatology, Baylor College of Medicine, Houston, United States

Goal: Develop increased understanding of RCDP and its application to interprofessional team training.

Objectives: Define RCDP and contrast it with traditional simulation, highlighting and demonstrating specific methods and educational content best suited for this technique. Outline key components of an RCDP teaching sequence, and discuss an approach to creating new RCDP sequences. Develop a new interprofessional RCDP sequence.

Course content: Rapid cycle deliberate practice maximizes the time learner teams spend in deliberate practice, with multiple rounds introducing progressively more challenging scenarios. Key components of RCDP include repetitive practice, with multiple chances to correct mistakes and perform correctly, and focused expert feedback. As such, RCDP techniques are best used in scenarios requiring complex team-based time-sensitive behaviors, with known best practice, such as ACLS or PALS-type scenarios. Faculty provide evidence-based feedback, with chances to implement those solutions in subsequent practice rounds. This workshop will focus on developing interprofessional RCDP. The workshop will begin with a brief didactic, focusing on appropriate learning objectives for RCDP scenarios, and comparing and contrasting RCDP to “traditional” debriefing. We will focus on how to divide a typical resuscitation case into smaller segments suitable for RCDP. The instructors will distribute RCDP lesson plans, and review techniques we have found helpful when teaching using RCDP, especially including learner psychological safety, which is particularly critical when implementing RCDP. We will show one video example of interprofessional RCDP. Small groups will work to develop a new interprofessional RCDP scenario sequence. We will end by summarizing key points and distribute electronic resources, including RCDP scenarios and lesson plans, as well as references.

Intended Audience: Intermediate/ advanced simulation instructors

Relevance to the Conference: This workshop will include opportunities for participants with varied learning styles to advance their knowledge, skills and attitudes towards implementation of resuscitation curriculum using RCDP. The workshop will have an embedded active learning component, in which participants actively choose appropriate RCDP content and design a novel RCDP scenario sequence. The large number of facilitators will allow for all learners to be engaged during the group exercise.

Timeline:

- (15 minutes) Introduction, disclosures, objectives. Define RCDP and highlight RCDP with active demonstration.
- (20 minutes) Didactic and large group discussion
  o Building interprofessional RCDP scenarios
  o RCDP teaching tips, RCDP video
  o Brainstorm ways to implement RCDP for interprofessional teams
- (45 minutes) Small group sessions. Learners begin to write interprofessional RCDP sequences.
- (10 minutes) Final debrief, conclusions, evaluations

References:


WS 02 – Juggling Many Balls And Spinning Many Plates: Exploring Multi-Patient Simulation
Simulation instruction design and curriculum development
Submission ID: IPSSW2017-1205

Carol Lynn O'Dea1, Frank Overly2, Mark Cicero3, Kevin Ching4
1Neonatology, Dartmouth-Hitchcock Medical Center, Hanover, 2Pediatric Emergency Medicine, Hasbro Children's Hospital, Providence, 3Pediatric Emergency Medicine, Yale New Haven Children's Hospital, New Haven, 4Pediatric Emergency Medicine, Cornell Weill Medical Center, New York, United States

Course Goal: Participants will receive practical instruction in multi-patient simulation design, application and evaluation.

Learning Objectives:
- Describe the strengths and limitations of multi-patient simulation and recognize necessary resources for its application.
- Identify the clinical, cognitive, human factors, and patient safety applications of multi-patient simulations.
- Formulate a multi-patient simulation design for an identified institutional need where one-patient/one-provider team simulation training is limiting.

Intended Audience: The workshop is appropriate for advanced learners. Targeted learners include physicians, nurses, respiratory therapists, simulation educators and simulation technicians.

Relevance to the Conference: Multi-patient simulations involve the use of multiple simulated patients within one simulation exercise. This type of simulation can involve one or many active participants in addition to confederates and provides an opportunity to educate and assess a wide range of technical and non-technical skills including clinical decision-making, triage and communication. Participants will leave the workshop with an understanding of the strengths and limitations of multi-patient simulation design and tools to develop and implement a multi-patient simulation for research and/or educational purposes at their home institutions.

Workshop Timeline:
- Introduction of the faculty and objectives (5 min)
- Review of multi-patient simulations in the literature and current simulation design (5 min)
- Review of faculty experiences in multi-patient simulation design and implementation (10 min)
- Full group brainstorming session on applications of multi-patient simulations with development of themes for use in #5. (10 min)
- Small group break-out sessions with focus on development/design of multi-patient simulations exercises applying themes developed in #4. (20 min)
- Full group session for small groups to report back about the design ideas generated during #5. (20 min)
- Questions/Wrap-up (5 min)

References:

WS 03 – Cultural Prototypes And Differences In Simulation Debriefing

Debriefing and teaching methodologies
Submission ID: IPSSW2017-1210

Francis Ulmer1*, Rana Sharara-Chami Ihsan2, Ella Scott3
1Pediatrics, Critical Care, Insel University Hospital, Zurich, Switzerland, 2Department of Pediatrics and Adolescent Medicine, American University of Beirut Medical Center, Beirut, Lebanon, 3Senior Simulation Operations Manager, Sidra Medical and Research Center, Doha, Qatar

Overall Goal: The workshop aims to raise awareness and invoke discussion around cultural influences on debriefing in different cultures

Learning Objectives: Participants will:
- Understand how hierarchy can be measured in cultural dimensions and how power distance is linked to national identity
- Become aware of cultural influences on communication and debriefing
- Learn to adapt their debriefing approaches to different cultures

Relevance to the Conference: The workshop offers a unique interactive opportunity to understand cultural dimensions and discuss the cultural aspect of simulation and debriefing with experts in the field. This will create an opportunity for participants to network with debriefers from other cultures and exchange ideas and strategies.

Workshop Timeline:
- Faculty and participant introductions, workshop objectives, brief description of cultural parameters: 10 min
- Interactive session: Simulation scenario and debriefing with different cultural groups: 30 min
- Interaction patterns exercise with faculty and participants: 20 min
- Short presentation of Hofstede’s cultural dimensions and results of culture-relevant debriefing topics from our research: 10 min
- Discussion and Questions related to the interaction pattern exercise: 15 min
- Final summary and Questions: 5 min

References:
2. Chung HS, Dieckmann P, Issenberg SB. It is time to consider cultural differences in debriefing.


Debriefing and teaching methodologies
Submission ID: IPSSW2017-1224

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1Bristol Medical Simulation Centre, 2Bristol Paediatric Simulation Programme, Bristol Royal Hospital for Children, Bristol, United Kingdom

Abstract Body: Educational literature describes the reflective journey of learners to include; reflection for action (Killion & Todnem), Reflection in action (Argyris &Schön), reflection on action (Argyris &Schön) and reflection beyond action (Driefuerst).

Traditionally debriefing models have focussed on facilitating post action reflection on action and often lacked the opportunity to implement deliberate practice. We set out to develop and standardise an approach that would incorporate strategies to implement reflection in action, deliberate practice and reflection post action. The BMSC developed the iTRUST approach, which provides facilitators with a structured approach to facilitate performance review and performance optimisation during simulation and post simulation.

The workshop will specifically focus on the application of this technique in educational events with technical skill (Cognitive & Procedural) learning objectives.

The workshop will be lead by multi-professional expert faculty with a wealth of experience in the use of the technique. It will provide attendees with the opportunity to implement approach whilst receiving feedback from faculty.

Structure of workshop:
- Overview 30min
- Facilitation of Reflection in action and re-immersing learners
- Implementation: Pause & Perfect – Learner Self Assessment 15min
- Implementation: Pause & Perfect – Facilitated Reflection 15min
- Facilitation post action review 15min
- Summary 15min

WS 05 – Using Plus-Delta-Plus Human Factors Debriefing To Bridge Simulation And Clinical Environments

Debriefing and teaching methodologies
Submission ID: IPSSW2017-1088

Caitlin O’Brien1, Kristen T. Leeman* 1, 2, Christopher Roussin3, Denise Casey1, Tricia Grandinetti1, Kristen E. Lindamood1
1Neonatal Intensive Care Unit, Boston Children’s Hospital, 2Instructor in Pediatrics, Harvard Medical School, 3Simulator Program, Boston Children’s Hospital, Boston, United States

Overall Goal: In this workshop, participants will learn how simulation can be used for providers to acquire debriefing skills that are readily transferable to the clinical environment. Many clinical crises that arise in the patient care environment involve a breakdown in one or more of the crisis resource management (CRM) principles. A barrier to debriefing includes a lack of an efficient and effective structure for the debrief session which can deter teams from consistently utilizing this powerful tool. During this interactive, dynamic workshop,
participants will be introduced to the framework of Plus-Delta-Plus Debriefing methodology and practice these skills in a hands-on session.

**Learning Objectives:**
- Through interactive discussion, participants will explore the benefits and challenges of debriefing in the clinical environment.
- Acquire skills to use simulation to teach an innovative debriefing technique that encourages group participation, open communication and focus on opportunities for improvement in a culture of safety.
- Demonstrate Plus-Delta-Plus Debriefing techniques with ability to incorporate the framework into the clinical environment.

**Relevance:** Simulation professionals can readily apply their debriefing skills used in team training to debrief real time events in the clinical care environment. Team debriefing helps to strengthen teamwork and improve interprofessional collaboration and education. Healthcare clinicians of all disciplines involved in simulation education and patient care will benefit from the exploration of this topic. Providing a simple, effective and efficient framework for debriefing, such as Plus-Delta-Plus, may help improve frequency and impact of sessions.

**Workshop Timeline:**
- Introductions of faculty and participants, workshop agenda and objectives (10 minutes)
- Assessment of participants experience with debriefing native teams in clinical environment (10 minutes)
- Survey results and barriers to team debriefing interactive discussion (10 minutes)
- Small group sessions including game play followed by Plus-Delta-Plus debriefing (40 minutes)
- Implementation and staff education using simulation (10 min)
- Final summary, conclusions, questions (10 minutes)

**References:**

**WS 06 – Using Simulation To Improve Staff Performance During Reorientation Of / Withdrawing Intensive Care Interprofessional Education (IPE)**

Submission ID: IPSSW2017-1083

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**Overall goal:** Reorientating from intensive to comfort (palliative) care, is a highly emotive time for all involved, requiring sensitivity, confidence and insightfulness of staff in offering families choices and managing logistics, e.g. rationalising therapies, death certification (practicalities & legalities), potential for organ/tissue donation. This workshop allows participants to explore how simulation can be used to teach these concepts, based on educational principles.

**Learning Objectives:**
- Construct an interprofessional simulation around reorientation of care, using an educational framework, encompassing the important features of simulation design, specific to their workplace
• Explore the necessary safeguards required when conducting simulation with high cognitive and emotional loads
• Leave the workshop with a framework to construct an educationally-sound simulation, including pre-brief, facilitation (incl. equipment), debriefing aspects & in-situ learner support mechanisms

Intended audience: All professionals interested in teaching simulation in neonatal/paediatric settings, where reorientation of care occurs. No prior knowledge of educational theory / simulation design is required.

Relevance to the Conference: This is a novel use of simulation-based learning to foster highly functioning skills in a multi-professional body of participants. Participants can use the material from this workshop for this purpose and other complex simulation designs, specific to their workplace, learner demands and facilities. This workshop will allow collaboration of ideas from like-minded simulation enthusiasts, on constructing complex simulation-based activities.

Workshop timeline:
• Introductions, faculty disclosures, prior experience of participants in topic area, workshop objectives (10 minutes)
• Presentation of faculty’s experience & need for set-up of reorientation of care scenarios (15 minutes)
• Group discussions around simulation design framework allowing participants to consider designs specific to their workplace needs – (i) drivers & learning objectives, (ii) facilitator requirements, pressures & limitations, (iii) session specifics, e.g. pre-brief, timing, equipment, format, (iv) debriefing principles, (v) evaluation & future work (55-60 minutes)
• Final questions & evaluations from participants, summary (5-10 minutes)

References:
David L. Rodgers¹, Roberta L. Hales²
¹Clinical Simulation Center, Penn State Hershey Medical Center, Hershey, ²Center for Simulation, Advanced Education, and Innovation, Children's Hospital of Philadelphia, Philadelphia, United States

**Goal:** Provide tools and information for learners to bridge the classroom to practice gap to move beyond effective training to training effectiveness.

**Learning Objectives:**
1. Identify the Kirkpatrick four levels of evaluation utilized in simulation based education
2. Design an assessment strategy focusing on Behavior (Level 3) and Outcomes (Level 4) for a given topic
3. State the opportunities and challenges in how the Simulation Educator role changes in evaluating the impact in Kirkpatrick Levels 3 & 4.

**Abstract:** Demonstrating simulation-based education value is critical for sustaining and growing simulation programs. Increased competition for limited financial resources forces the larger organization to make decisions that have implications for simulation programs. Regardless if the program is based in a hospital, academic, or other workplace location, being able to show real impact on the organization’s mission must be demonstrated for the program to remain vital.

However, too often simulation programs limit their outcomes evaluations to what learners know when they walk out of the simulation lab and not what they do in practice, let alone how this training impacts organization outcomes. The Kirkpatrick Evaluation Model has been used in organizations of all types for over 50 years and has proved to be a reliable tool for evaluating education course impact.

This workshop will examine the Kirkpatrick 4-Level Model (Reaction, Learning, Behavior, Outcome). Using a series of case studies, participants will examine the changing role of the Simulation Educator in the Kirkpatrick Model, determining ways to bridge the gap between classroom and clinical application. Participants will review Kirkpatrick concepts such as critical behaviors and leading indicators, and engage in interactive project planning to build behavioral and outcomes evaluation measures into the case studies.

Participants will engage the faculty and other attendees in planning how they can bridge the classroom to practice gap in their own organizations, including examining how the Simulation Educator role must evolve to demonstrate organizational value.

**Format:** Interactive workshop with small groups discussion centered on case studies developing a project example to be presented to the larger group in conclusion.

**Timeline:**
- 00:00-00:07 – Introductions, Overview, Objectives
- 00:07-00:20 – Background, Review of Kirkpatrick Evaluation Model
- 00:20-00:40 – Case Study 1 (Hospital Model) – Introduce case study, make assignments, small group work to develop evaluation plan for Training Effectiveness.
- 00:40-00:50 – Report out and discussion for Case Study 1
- 00:50-01:10 – Case Study 2 (Academic Model) – Introduce case study, make assignments, small group work to develop evaluation plan for Training Effectiveness.
- 01:10-00:20 – Report out and discussion for Case Study 2
- 01:20-01:30 – Conclusion with discussion on role of the Simulation Educator in the new Kirkpatrick Model.

**References:**
7. Kirkpatrick, JD, & Kirkpatrick, WK. *Kirkpatrick Then and Now: A Strong Foundation for the Future*. Kirkpatrick Partners, St. Louis, MO.

**WS 08 – Debiasing As A Tool For Closing Performance Gaps**

*Debiasing and teaching methodologies*

Submission ID: IPSSW2017-1116

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**Abstract Body:** This workshop familiarizes participants with the theory and practice of conducting formative assessments in debriefings. These steps include identifying a performance gap, investigating the basis for the gap, and providing specific feedback to help close the gap. The workshop blends didactic and experiential approaches to provide participants the concepts and experience to conduct formative assessments using debriefing. The workshop builds on published articles that participants can use for learning or teaching debriefing in their own contexts.

This workshop is based on work done by: Jenny Rudolph, PhD, Robert Simon EdD, Daniel Raemer, PhD and Walter Eppich, MD Med Acad Emerg Med. 2008 Nov;15(11):1010-6

**Learning Objectives:** By the end of this workshop, the participant will be able to:

- Distinguish the role of formative assessment in healthcare education and compare and contrast it with summative assessment
- Apply the prescribed steps in debriefing and bedside teaching in clinical environments with the aim of closing performance gaps
- Integrate formative assessment into scenario design and subsequent debriefing to enable identifying and addressing performance gaps

**Format:** The workshop will use a combination of large group and small group practice exercises. Following introductions, a didactic component will be presented outlining the role of formative assessment, an algorithm for observing, identifying and addressing performance gaps, and balancing advocacy and inquiry to uncover the learning needs to achieve improved results. Video of simulated pediatric cases will be shown followed by a simulated debriefing with the authors playing the roles in the video. A moderator will provide feedback on the debriefing approaches and mechanics. The workshop will end with a summary and solicitation of the learning points from the participants. The approximate timing of the 90 minute session will be: Introductions (5), interactive didactic on formative assessment and good judgment debriefing (25), large group practice and feedback (25), small group feedback (25), summary and closing remarks (10).

**References:** J Rudolph, PhD, R Simon EdD, D Raemer, PhD and W Eppich, MD. Acad Emerg Med. 2008 Nov;15(11):1010-6

**Disclosure of Interest:** D. Raemer Research/Education Support from: CMS offers tuition based courses on this topic, J. Rudolph Research/Education Support from: CMS offers tuition based courses on this topic, A. Navedo: None Declared, J. Arnold: None Declared

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**WS 09 – Are You Prepared For A Disaster? Using Simulation For Pediatric Disaster Triage Education**
Interprofessional Education (IPE)
Submission ID: IPSSW2017-1090

Maria Carmen G. Diaz\(^1\), Mark Cicero\(^2\), Daniel J. Scherzer\(^3\), Marc Auerbach\(^2\), Barbara Walsh\(^4\), Grace Arteaga\(^5\)

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Proposed Format: This immersive, hands-on workshop will begin with an overview of pediatric disaster triage and disaster training principles. We will discuss triage algorithms, resource utilization, policies and procedures, as well as unique aspects of care of children involved in a disaster. Participants will then experience three different types of simulation modalities that may be used for disaster triage education:
- Participants will run through a tabletop simulation exercise to highlight disaster planning and logistics of a response
- Video game-based simulation will be used to review and apply jumpSTART/START and mass casualty triage algorithms
- Live simulation will be used to provide an overview of triage and resource utilization

Workshop leaders will facilitate a discussion about nuances of each type of simulation, potential real life applications and integrated training strategies. Participants will discuss skill retention, just-in-time training and team dynamics. Participants will work in small groups, then share their ideas and experiences in teaching and practicing disaster exercises. Workshop leaders and participants will also review how these three simulation modalities may apply to other educational endeavors.

Learning Objectives:
- Participants will review and evaluate pediatric disaster triage algorithms and disaster training principles.
- Participants will compare and contrast various simulation modalities that may be used in pediatric disaster education.
- Participants will identify specific education gaps that simulation could address in pediatric disaster triage training.

Relevance to this Conference: Disasters are high-stakes, low-frequency events that may potentially overwhelm healthcare resources. Accurate and effective triage of disaster victims helps to ensure that available resources are efficiently allocated to a large number of patients with a range of immediate needs. Disaster triage is a crucial tool, yet existing education and training on this topic is limited. Simulation educational modalities are interactive and can be effective tools for disaster education. Simulation helps individual learners and teams acquire disaster-specific knowledge and skills that focus on injury and illness, policies and activation protocols, resource utilization and psychosocial issues.

Workshop Timeline:
- Welcome/Introductions/Objectives (5 minutes)
- Overview of pediatric disaster triage and disaster training principles (15 minutes)
- Simulation stations – participants rotate through each station (60 minutes)
  - Station #1 – Tabletop exercise
  - Station #2 – Live simulation
  - Station #3 – Video game simulation
- Large group discussion (10 minutes):
  - Feedback
  - Advantages and disadvantages of each type of simulation
  - Summary

References:

**WS 10 – On The "Need For Speed": Pros And Cons Of Using Speeded Practice In Simulation Education**

*Simulation for procedural and psychomotor skills*

Submission ID: IPSSW2017-1242

Martin Pusic*, 1, David Kessler2
1Emergency Medicine, NYU School of Medicine, 2Pediatrics, Columbia University, NEW YORK, United States

**Overall Goal:** Chronometry, the purposeful measurement of time, has been under-investigated in the teaching and learning of medical procedures. To a greater or lesser extent, time plays an important role in medical procedural learning and yet we rarely pull out the stopwatch and explicitly provide that kind of feedback. In this workshop, we will use examples from motor skill learning to consider the pros and cons of using speeded practice within the context of simulation. Education programs that do not directly address this speed-quality trade-off by explicitly collecting and analyzing chronometric data, may be disadvantaging their learners especially for procedures that are speed-advantaged.

**Learning Objectives:**
- PWBAT describe the theoretical underpinnings of the Speed-Accuracy tradeoff including Fitts’ Law
- PWBAT incorporate chronometry in the teaching of a simple psychomotor surgical tying task
- PWBAT list the advantages and disadvantages of introducing time-pressure as a desirable difficulty in the learning of procedures.

**Intended Audience:** Simulation educators responsible for psychomotor learning

**Relevance to the Conference:** In modern clinical practice, being able to safely accomplish a clinical task at greater speed is becoming an ever more prominent objective.

**Workshop timeline:**
- 5 min: Introductions
- 15 min: Theoretical underpinnings of the Speed-Accuracy Tradeoff (Fitts' Law)
- 20 min: Simulation of surgical tying task (ligature and division of surgical tubing – sim of vein ligature and division); participants will work in pairs and time each other
- 20 min: Reporting and Discussion of time variance within and between individuals; covariates
- 10 min: Sam surgical tying task but now under "chronometric pressure" - beat your best time by 20%
- 15 min: Reporting and Discussion of effect of chronometric pressure
- 5 min: Summary and Research Directions

**References:**
WS 11 – A Blended Approach To Effective Feedback In A Developing Country

Debriefing and teaching methodologies

Submission ID: IPSSW2017-1057

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Background: Interest in engaging simulation as a teaching modality in developing countries is growing. Optimizing simulation augmented learning requires an additional set of skills related to experiential learning theory and the effective use of feedback in practice. In the developed countries, the culture supports the giving/receiving of feedback using 3 different and effective approaches. The choice is guided by the level of learner and the type of simulation. In developing countries the culture of giving and receiving feedback is novel and resources limited. The blending of approaches is important to ensure performance gaps are closed. The goal of this workshop is to introduce a framework for teaching healthcare professionals how to facilitate effective feedback both in simulation and in practice in a developing country.

Faculty will share their experience with facilitating a Train the Trainer (TTT) course in Malawi and the framework they used to ensure faculty were competent closing performance gaps. Three approaches to feedback and specific relevance for engaging each will be reviewed (direct feedback, plus/delta and advocacy/inquiry). Adapting feedback styles and using a blended approach will be emphasized.

In the second phase each group will have an opportunity to delivery feedback using a blended approach. Participants will work with a preset script to identify the performance gap, and design effective feedback. Faculty will provide coaching and a second opportunity so participants leave this phase feeling successful with delivery of feedback.

In the last phase, challenges and successes related to feedback in resource limited settings will be discussed.

Session Learning Objectives: By the end of this course attendees will be able to:
(a) Identify three ways to provide effective feedback
(b) Demonstrate a blended feedback approach to close scripted performance gaps
(c) Identify the challenges and successes for feedback delivery in developing countries

Intended Audience: Participants from developing countries or those interested in working or/and volunteering in developing countries. Relevant for a novice to expert level of feedback skills.

Workshop Timeline:
- Background (15 minutes)
- Interactive Session (60 minutes): Dyad/Coaching, Groups work to design/deliver blended approach in delivering feedback
- Summary (15 minutes): Group Discussion. Successes and challenges

References:

WS 12 – From The Idea To The Stage

Simulation instruction design and curriculum development
Submission ID: IPSSW2017-1027

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1Pediatrics, Weill Cornell medical college-Qatar, 2Pediatrics, HAMAD MEDICAL CORPORATION, Doha, Qatar

Abstract Body: This 90 minutes workshop is designed for simulation learners from novices to intermediate. It focuses mainly on the process of simulation-based education which is the session design. Learners might have a difficulty to generate ideas even if they are very expert in their field. Or they might have excellent ideas but they are not able to convert them to good simulation experience. This workshop will help the simulation learners to overcome those difficulties. After the workshop, the learners will be able to generate the simulation session and make it live.

In this workshop the learners will design a simulation scenario from an idea generated from their curriculum. The learners will participate hands-on in each step until they develop a full scenario that can be implemented directly to a simulation practice. How to convert the idea to script? How to create the storyboard? How to prepare the theater for the simulation session? Make it Live!

The instructor is expert in healthcare simulation education and CHSE certified. The author is presenting this workshop as a focused skill of the full simulation instructors’ skills workshop. The author’s hypothesis is to work well in healthcare simulation scenario design; you need to learn many other disciplines other than healthcare and simulation. Filming, storywriting and theater design are some examples the author learnt to help him in scenario design.

The time of the workshop is fragmented to small introduction about the workshop then small groups will be assigned for hands-on activities to compete for the best to win a symbolic prize (by all attendees voting) at the end of the workshop.

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WS 13 – Train The Trainer: Mobile Simulation Connecting Academic & Community Sites To Bridge Gaps In Care Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1220

Barbara M. Walsh* 1, Marc Auerbach2, Sandeep Gangadharan1, Jessica Katz-Nelson3, Mindy Hamilton4, Marcie Gawel2
1Pediatrics, Hofstra Northwell school of Medicine, New Hyde Park, 2Yale School of Medicine, New Haven, 3Johns Hopkins School of Medicine, Baltimore, 4Pittsburgh School of Medicine, Pittsburgh, United States

Abstract Body: ImPACTS, a collaborative of pediatric simulation experts focuses on development, execution & sustainment of community based, pediatric specific, mobile, in situ simulation programs (MISSP) to engage community partners in improving pediatric acute care. This concept can be applied globally in medicine. Our workshop will impart tools to adapt a current MISSP & assist in early development strategies for implementation of participants own MISSP.

The learners will be able to:
- List 3 methods of contact with community sites & have a plan in early development for engagement
- Practice & Review 1 simulation scenario for case development, goals, objectives, & execution
- Review an ignition checklist for referral that will guide key features for a successful program

ImPACTS connects children’s hospitals with community partners through simulation training/education. Community hospital healthcare providers (CHHPs) often lack ongoing exposure to & experience with critical events compared with continuous training available at academic medical centers (AMCs). AMCs may have enhanced education/training through their access to subspecialty expertise & simulation specialists/equipment. CHHPs may not have such resources & are handicapped when practicing critical events & team training. Mobile outreach simulation is a great way to bring these critical simulation experiences to CHHP. It allows simulation specialists & multi-professional subspecialty educators to bridge gaps in care by engaging community sites in their own clinical setting with a goal of sharing expertise using simulation techniques & technology. Our group iteratively developed 4 pediatric (PEDS) cases (seizure/stridor/sepsis/cardiac arrest). We enrolled community & PEDS sites to evaluate care provided to PEDS patients across a spectrum of EDs. Sessions involved scripted debrief of key points, environment analysis, & safety of care delivered.
This workshop is intended for providers of moderate experience in simulation training/education interested in interdisciplinary MISSP. The workshop is relevant to the IPSSW conference as it promotes MISSP engagement with CHHPs to improve care of children in multiple venues & targets IPSS core values.

The introduction will involve a didactic slideshow to discuss the basics of ImPACTS, laying a foundation for hands-on work -0-15 min. The main portion will be three interactive rotating stations -15-75 min, 20 min each. **Station 1** is a table focusing on engagement of community sites, working through checklists & encouraging participants to create a strategy. **Station 2** will engage learners in a brief simulation – focusing on scripting, goals & objectives, & execution based on Kerns model of curriculum development. **Station 3** is a table discussing logistics of outreach, understanding pearls & pitfalls to make a program successful. The **conclusion** will be an expert panel for questions & answers & to discuss global issues -75-90 min.

**References:**

**WS 14 – Beyond Procedures: Designing A Comprehensive Boot Camp Experience**
*Simulation instruction design and curriculum development*
Submission ID: IPSSW2017-1034

Elizabeth Biddell1, Stephanie Estephan1, Kristine Nagy1, Wendy Van Ittersum1
1Austen Simulation Center For Safety and Reliability, Akron Children's Hospital, Akron, United States

**Goal:** This workshop will guide participants through developing a comprehensive boot camp from needs assessment to resource allocation and program execution.

**Objectives:** By the end of this workshop, participants will:
- Examine methods to create a thorough needs assessment.
- Describe instructional designs most appropriate for a proposed boot camp.
- Identify resources necessary for program execution and plan for resource allocation.
**Intended Audience:** Intermediate to advanced healthcare simulation educators working in a hospital based simulation program.

**Relevance to Conference:** From physician and nursing residency and fellowship programs to hiring new graduates, there is a need for orientation programs that prepare trainees and new staff in an efficient but thorough manner. This need is exacerbated at pediatric hospitals due to relatively minimal pediatric education in most healthcare training programs. Many post graduate programs have developed “boot camps” that primarily address procedural skills. However, orients are expected to effectively navigate many other skills including patient hand-offs, effective interpersonal communication, and efficient use of the electronic health record more often than procedural skills. Often these non-technical skills impact orients’ performance and perceived competency more than procedural skills. Presenters with several years’ experience developing and implementing comprehensive boot camps for a variety of learners will share their experiences and guide participants through the process of developing and implementing a comprehensive boot camp for their institution.

**Timeline:**
- Introductions, Disclosures, and Objective Overview: 5 minutes
- Presentation – Needs Assessment: 5 minutes - How to develop a needs assessment
- Small Group Discussion: 10 minutes - Identify stakeholders and local needs
- Presentation – Course Development Part 1: 5 minutes - Key considerations for designing a comprehensive boot camp
- Small Group Discussion: 15 minutes - Brainstorm boot camp design
- Presentation – Course Development Part 2: 5 minutes - Discuss simulation methods and designs to meet goals
- Small Group Discussion: 15 minutes - Map out proposed content and identify instructional methods
- Presentation – Logistic Planning: 5 minutes - Schedule development and resource identification & planning
- Small Group Discussion: 20 minutes - Determine boot camp logistics
- Questions: 5 minutes

**References:**


WS 15 – Stirring The Pot: Blending Medical, Interprofessional & Patient-Centered Objectives In Simulation

Topic: Interprofessional Education (IPE)

Submission ID: IPSSW2017-1094

Hilary Woodward*, 1, David Kessler2, Daniel Fenster2, Nazreen Jamal2, Jessica Kirsch1, Selin Sagalowsky2
1NewYork-Presbyterian/Morgan Stanley Children's Hospital, 2Columbia University Medical Center, New York, United States

Goal: The goal of this interactive session is to provide learners with strategies for simulating clinical scenarios containing challenging human factors. We will focus on simulating the psychosocial needs of the patient & family and engaging interdisciplinary team members to meet these needs, while simultaneously incorporating the medical aspects of the case. Situating these patient-centered and interprofessional objectives alongside medical learning objectives can increase relevance and buy-in for learners while fostering multidisciplinary collaboration. Participants will practice applying these strategies during the workshop and acquire the tools needed to incorporate these interprofessional & patient-centered objectives in their simulation scenarios.

Learning Objectives:
- Participants will categorize human factors scenarios and identify interprofessional partners for simulation.
- Participants will utilize the provided framework to plan a simulation with medical, interprofessional, and patient-centered objectives.
- Participants will identify potential challenges with proposed cases and discuss strategies for addressing these challenges.

Intended Audience: Interdisciplinary clinical staff, educators, and/or leaders

Relevance to the Conference: Presented by a team of physicians, nurses, and child life specialists, this workshop embodies the conference theme of “collaborate, create, captivate” by engaging multidisciplinary participants to utilize innovative frameworks for optimal collaboration and learning through simulation.

Workshop timeline (90 minutes):
Introductions of presenters, participants, and objectives - 00:00-00:10
Introduction of patient-centered & interprofessional simulation framework, with rationale, case example, and large group discussion - 00:10-00:35
Small group exercise (multidisciplinary brainstorming, framework handout completion) - 00:35-00:60
Large-group case sharing and discussion - 00:60-00:80
Summary - 00:80-00:90

References:

WS 16 – Developing A Simulation Based Return To Work Programme: 5 Year Experience Of London PRACP course
Programme development/ Administration and Program Management
Submission ID: IPSSW2017-1115

Mithila D’Souza1, Trisha Radia∗1,2, Camilla Kingdon1, Mehrengise Cooper1,3
1London School of Paediatrics, 2General Paediatrics, Croydon University Hospital, 3Paediatric Intensive Care, Imperial College Healthcare NHS Trust, London, United Kingdom

Workshop leaders: Dr. Trisha Radia, Consultant Paediatrician, Croydon University Hospital, London, UK. Dr. Mehrengise Cooper, Consultant Paediatric Intensivist, Imperial College Healthcare NHS Trust, London, UK.

Workshop Purpose: Simulation based return to work (RTW) programmes are not currently run in any other specialties in the UK, except anaesthesia. Developing a simulation based return to work programme: Five year experience from the London School of Paediatrics (LSP) Paediatric Return to Acute Clinical Practice (PRACP) Course.

Learning Objectives:
• Identify the unique training needs of individuals returning to work
• Determine the importance of embedding simulation within a comprehensive RTW course, and how this approach can optimise simulation learning outcomes
• Appraise different feedback styles and their effectiveness in achieving the learning outcomes of this target group
• Consider aspects of compulsory and voluntary participation

Workshop Outline:

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WS 17 – Building Robust Assessment Tools For Simulations In The Era Of Milestones And Epas
Assessment (including use and validation of measurement and assessment tools)
Submission ID: IPSSW2017-1102
Karen Mangold* 1, Mary McBride1, Mark Adler1
1Pediatrics, Feinberg School of Medicine, Northwestern University, Chicago, United States

Abstract Body: This workshop aims to build foundational knowledge regarding simulation-based assessment through a didactic session followed by small group work. It is targeted to the novice educator who wishes to obtain knowledge regarding the development of assessment tools that address the Pediatric Milestone Project and Pediatric Entrustable Professional Activities (EPAs). Participants will have the opportunity to start developing their own tool.

- By the end of the workshop, participants will be able to:
- Define at least 3 sources of validity evidence (e.g. scale, stakes and reference)
- Distinguish between reliability and validity
- Begin to design a simulation assessment tool that incorporates pediatric Milestones and EPAs

We will begin with introductions and a needs assessment of the participants to ensure that the workshop will be learner-focused. We will present an overview of factors that go into assessment tool development. Key success factors such as content, environment and standardization will be discussed. We will emphasize how implementation context directly impacts design and review various options, such as skills checklists and computerized feedback. We will also discuss ways that items from the published Milestones or EPAs might be incorporated into tool development. The session will then explore the definitions and applications of validity and reliability. Types of statistical approaches that inform psychometric analyses will be reviewed but not covered in great detail. The components of validity evidence will also be discussed, emphasizing the need to establish validity evidence for each situation in which the assessment tool is used. The participants will then have the opportunity to develop their own assessment tool. They will use a worksheet to consider components such as context, scale and stakes. They will then present their tool to a small group and receive feedback from facilitators and co-participants. The workshop will conclude with the small groups presenting common themes back to the whole group.
This workshop will appeal to simulation educators given the importance of ACGME Milestones and EPAs in assessment of undergraduate and graduate education.

**Timeline:**
- Introductions and Needs Assessment of the Learners – 5 minutes
- Didactic Presentation-15 minutes - Reviewing types of assessments, validity and reliability, including examples that incorporate Milestones and EPAs
- Didactic Description of Assessment Tools - 10 minutes - Including types of tools
- Personal Activity – 20 minutes - Working to develop an assessment tool
- Small Group Activity – 20 minutes - Presenting personal assessment tools to a small group
- Large Group Activity – 15 minutes - Presentation of small groups to the entire group
- Wrap up and questions – 5 minutes

**References:**

**WS 18 – Leveraging Simulation And Debriefing To Reduce Diagnostic Errors By Pediatric Health Care Providers**

*Simulation instruction design and curriculum development*

Submission ID: IPSSW2017-1059

Gunjan Tiyyagura* 1, Marc Auerbach1, Ambrose Wong1, Isabel Gross1, Matthew Lipshaw1

1Yale University School of Medicine, New Haven, United States

**Goal:** To reduce diagnostic errors in pediatrics through simulation-based training

**Objectives:** By the end of the session, attendees will be able to:
- Identify the dual types of thinking used in the diagnostic process, and common sources of diagnostic error
- Conduct the presented intervention with trainees at their home institutions
Implement debriefing strategies that enhance training related to cognitive bias in ongoing simulation-based training at home institutions

**Intended Audiences:** Simulation based educators at intermediate/advanced levels

**Relevance to the Conference:** A recent Institute of Medicine Report noted that diagnostic error contributes to 10% of patient deaths and called for enhanced health care provider education in the diagnostic process through simulation.\(^1\) Traditional reflection on action debriefings may limit the consideration of intuitive processes that play a role in clinical decision making while focusing on analytic thinking.\(^2\) Reflection in action debriefing is an effective complementary approach when the goals relate to biases and diagnostic errors.\(^3, 4\)

**Workshop Timeline:**
- **Introduction:** Introductions, Disclosures, Objectives, Agenda (5 minutes)
- **Simulation #1:** An inter-professional team of 3-5 attendees will participate in a simulation of an infant presenting with an orbital bruise. The initial presentation leads them down the pathway of child abuse, however further information reveals this is due to neuroblastoma. (5 minutes)
- **Debrief #1:** A scripted debrief involving reflection on action related to clinical reasoning, metacognition and biases (premature closure). (10 minutes)
- **Large group discussion on dual modes of thinking (intuitive vs. analytic), cognitive biases, and diagnostic error prevention strategies using audiovisual slides.** (10 min)
- **Simulation #2:** A toddler with a history of asthma presents with increased work of breathing. The initial presentation leads them down the path of asthma, however further information reveals this is due to myocarditis. During this “slow-motion” simulation participants will be encouraged to “think out loud” their thought processes. A pause button will be available to the faculty/observers to stop the case at any time to micro-debrief through reflection in action. (10 minutes)
- **Debrief #2:** A scripted debrief involving reflection on action related to strategies to prevent cognitive bias and reduce diagnostic errors. (10 minutes)
- **Small faculty-led working groups will develop a simulation scenario and debriefing script to be conducted at home institutions.** (30 minutes)
- **Large group discussion about how to guide teaching about cognitive biases through the developed scenarios and debriefs.** (10 minutes)
- **Summary/Questions (5 min)**

**References:**

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**WS 19 – The Engineering of Sim: Creating an "In-house" Service for 3D Printing and Design of Novel Trainers Innovation/ Future Direction and Outreach Simulation**
Submission ID: IPSSW2017-1194

Melissa Burke\(^1\), Stephen Wilson\(^2\), Gregory Loan\(^1\), Katie Livingston\(^1\), Andrew Hosmer\(^1\), Noah Schulz\(^2\), Mariah Geritano\(^1\), Peter Weinstock\(^4\)

\(^1\)Simulator Program, \(^2\)Simulation Center, Boston Children's Hospital, Boston, United States

**Objectives:** At the conclusion of this workshop, participant will:
Understand the key engineering and design pillars that support medical simulation at a pediatric teaching hospital and tertiary care center, and the activities associated with each: a) Digital modeling and 3D Printing of patient anatomy for the purpose of surgical pre-planning b) design and fabrication of custom trainers.

Virtually Tour an in-house SIMEngineeringStudio to understand operations strategies and standard operating procedures associated with facilities, printers, manpower, professional services, technical aspects of anatomic reproduction/model creation.

Understand the design process for novel simulation trainers by learning from recent BCH projects including a gun shot wound and ECMO trainer.

Have the opportunity to view special effects techniques (molding, sculpting, moulage and artistry).

**Intended Audience:** The intended audience is clinicians, technicians, educators and administrators of all levels interested in 3D printing for surgical rehearsal and/or the engineering of pediatric simulation trainers for clinical skills, team, and preparedness training.

**Relevance to the Conference:** Ready-made SIMEngineering services and techniques demonstrated in this workshop support and enhance clinical rehearsal opportunities and team training.

**Workshop timeline:** 90 min
- **Introduction:** Faculty and participant introductions, verbal faculty disclosure, workshop objectives, agenda and assessment of learner’s experience with this topic (5 minutes)
- **Background, rationale and development strategy of the BCH SIMEngineering division** (5 minutes)
- **Virtual Tour of SIMPeds EngineeringStudio** (15 minutes)
- **Didactic:** Running a hospital-wide 3-D printing service for surgical pre-planning (30 min)
- **Demonstration:** Simulation trainers and demonstration of design and fabrication techniques (30 min)
- **Summary, questions and closure** (5 minutes)

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**WS 20 – Using Simulation To Teach Family-Centred Care In An Interprofessional Environment**

*Interprofessional Education (IPE)*

Submission ID: IPSSW2017-1045

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**Abstract Body:** Client and family-centred care (CFCC) is a key value at Holland Bloorview Kids Rehabilitation Hospital (HB). In this interactive workshop, learn how HB developed an experiential learning environment and teaches the four core family-centred care principles using simulation.

To arrive at a meaningful simulation training program, we engaged in a day-long, co-creative process with 32 members of our community including representation from clinicians, management, students, and most importantly, family leaders (advisors) to collectively build 8 simulation scenarios mapping onto these principles. Four groups were provided with observable behavioural statements for each core principle, enabling client and family centred care to move from an abstract concept to specific measurable behaviours critical to providing optimal client and family-centred care. Participants shared personal stories and themes emerged to build the foundation for the simulations. Each group then completed a simulation scenario template grounded in learning objectives using Bloom's (1956) verbiage. By the end of the day, 8 simulation scenarios were developed; one inpatient and one outpatient simulation per principle. This innovative building process was evaluated using a written survey and the ORID framework for structured conversations (Stanfield, 2004) to capture what emerged for participants during the process. These scenarios will be instrumental educational tools for teaching client and family-centred care for the broader system and will be seamlessly interwoven into the organization’s existing structures and processes such as interprofessional orientation for new staff, student orientation, grand rounds and team meetings.

**Outcomes:**
Participants commented that the scenarios had raised their awareness about communication issues, taught them skills for better communication with clients/families, stretched their comfort zones, increasing their confidence and caused them to be more mindful about their own interactions with clients/families. Participants commented that families appeared to be more at ease, opened up more, and were generally more satisfied.

**Proposed Format:** The key success factor for any simulation is the authenticity of it. Participants will learn how engaging all stakeholders including clients and families in developing and facilitating simulations leads to the simulation being authentic. This workshop will describe the process of developing the CFCC behavioural indicators for teaching purposes and outline the simulation development templates. Participants will learn how they can use simulations to teach CFCC behaviours. Workshop participants will have the opportunity to participate in video simulations and the process of debriefing a simulation scenario will take place in real time. Challenges and opportunities to the use of simulation in any organization will be discussed. The workshop is intended for educators, senior management and administrators.

**Image:**

<table>
<thead>
<tr>
<th>Content (Topics)</th>
<th>Time Frame</th>
<th>Teaching Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Highlight Hollard Blochow's experience in engaging all stakeholders including patients and families to co-construct simulations</td>
<td>15 minutes</td>
<td>PowerPoint presentation, Story telling</td>
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<tr>
<td>• Outline how the simulation scenarios were integrated into a full-day education program</td>
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<td>• Share evaluation data</td>
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<tr>
<td>• Engage participants in a simulation and debrief (Respect and Dignity)</td>
<td>30 minutes</td>
<td>Participate in video simulation</td>
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<td>Large group debrief</td>
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<tr>
<td>• Engage participants in a simulation and debrief (Partnership/Collaboration)</td>
<td>30 minutes</td>
<td>Participate in video simulation</td>
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<td>Large group debrief</td>
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</table>
| • Facilitate a discussion about challenges and opportunities to use simulation to teach patient and family-centred care in organizations | 15 minutes | Large group discussion                
|                                                                                  |            | O & A                                 |

**OP 01-1 – The Mepa Global Rating Scale For Simulation-Based Assessment: A Multicentre Validation Study**

*Assessment (including use and validation of measurement and assessment tools)*

Submission ID: IPSSW2017-1069

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**Introduction:** Worldwide there is increasing interest and implementation of multi-modal assessments of physician competence. Building on our previous work in this field¹, we conducted an international multi-centre validation study of simulation-based assessment tools in pediatric anesthesia as applied to a full range of anesthesiologists, from junior trainees to veteran Staff. Our objective was to use Messick’s framework² to provide arguments for the reliability and validity of our scenarios and instruments, and be able to generalize to a broader context.
Methods: Nine centres in Canada and the UK recruited participants to engage in the Managing Emergencies in Pediatric Anesthesia (MEPA) simulation course. Participant demographics were collected, including duration of training and experience in anesthesia and pediatric anesthesia. Performances were video recorded. Five expert raters, were trained to use two tools for rating each scenario - a scenario-specific checklist (CL) and a global rating scale (GRS). A large random sample of the total video pool were rated by all the raters in order to establish their inter-rater reliability. The remaining videos were divided between the raters for solo rating. Correlations were sought between seniority of practitioner and performance. Multiple linear regression was applied to demonstrate impact of co-variates.

Results: Over an 18-month period, we collected data on 469 simulation encounters. 140 videos were rated by all the raters. The overall intraclass correlation coefficient for the CL was 0.96 and for the GRS was 0.91 (p<0.001). Despite the slight variation in reliability by scenario, the reliability of the CL and GRS is substantial and overall is near-perfect. Importantly, the GRS which eliminates content specificity (and is designed to distinguish practitioners ready for independent practice from those who are not) shows excellent reliability. We demonstrated a correlation between practitioner experience and performance on our assessments and present validity arguments in all five of Messick’s domains.

Conclusion: The positive correlation of performance scores with practitioner grade indicates that the transition into scores that would constitute a “pass” occurs at around four years of postgraduate training as trainees are moving into their senior training grades. This shows the level of scenario difficulty in combination with the assessment tools are well calibrated for their objective. The MEPA GRS has been adopted as the principal outcome measure for the Canadian National Anesthesia Simulation Curriculum and is being integrated into assessment of anesthesia residents in Canada. This study provides further validity evidence for its use in these assessments of readiness for practice. The nature of the scenarios and tools are not unique to pediatric anesthesia and our conclusions can therefore be generalized to performance assessment across anesthesia, in postgraduate training and independent practice.

References:
on 6 SBT - SUDI scenario, SimNewB, Laerdal*. Observers assessed the FF role. The definitive scale was used on 15 SBT (Sim1) with residents, nurses, & nurse assistants - CPR scenario, SimNewB*. An actor played the parent. Two independent observers assessed the FF role and the TAPAS scale (2). A good judgment debriefing followed SBT. At 1 month Sim2 was set with a similar scenario but not identical. Psychometrics calculation included: Cronbach Alpha (CA), Spearman correlation coefficient, R2, Interobserver Correlation Coefficient (ICC). For each participant, subjective assessment of self-confidence, stress before & during SBT, cognitive load during, dissatisfaction after, and realism used 0-10 scales. We compared Sim1 to Sim2 scores for FF role and TAPAS. Comparison of means used t-test. A p value <0.5 was considered significant. 

Results: The FF scale had 37 items divided into 3 parts: before parental presence, during RCP, and after RCP. Psychometrics were: CA=0.699, correlation coefficient=0.928, R2=0.86, and ICC=0.80. Observers’ means were not different (p=0.78). FF scores improved from Sim1=34.3±11.42 to Sim2=54.93±10.82 (p<0.0001), as well as TAPAS: Sim1=42.93±17.76, Sim2=60.8±16.53, p=0.008. Realism and stress level before SBT were unchanged between Sim1 & Sim2. Sim2 significantly increased confidence (p=0.016), decreased stress (p<0.0001) and cognitive load (p=0.007) during SBT, and dissatisfaction after (p<0.0001).

Discussion/Conclusion: To our knowledge this is the first assessment tool designed to evaluate the FF role during child CPR. We found it valid and reliable. Its use could widen the scope of SBT for CPR in children by providing a valuable tool to promote parental presence.

References:

OP 01-3 – Development Of A Simulation-Based Interprofessional Teamwork Assessment Tool For Residents Assessment (Including use and validation of measurement and assessment tools)
Submission ID: IPSSW2017-1178

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Context: The Accreditation Council for Graduate Medical Education’s (ACGME) Milestone Project has driven each specialty to identify skills essential for competency, and to develop valid, objective means to assess competency.1 The pediatric milestones subcompetency, “Work in interprofessional teams to enhance patient safety and improve patient care quality (SBP3)”, was identified as suitable for simulation-based assessment.2 While several teamwork and interprofessionalism tools exist, most focus on performance of the entire team or the team leader in an acute event. Few tools assess both teamwork and interprofessionalism in the same context for an individual. A tool to assess an individual trainee functioning in any role on an interprofessional team in a variety of scenarios would be a valuable addition to the ACGME’s competency-based Next Accreditation System.3 Our objective is to develop a valid, simulation-based assessment tool to assess interprofessional teamwork in a standardized and reproducible manner.

Description: We developed a tool to assess SBP3 in a simulated environment using Delphi methodology 4,5 With the assistance of a medical librarian, we conducted a systematic review of existing tools to assess interprofessionalism and/or teamwork using direct observation in a clinical or simulated setting. Databases searched included PubMed, Ovid, MedEd Portal, as well as unpublished and grey literature. Items were reduced using pre-defined criteria. Remaining items were included in the Delphi process. Twenty-two individuals
representing 5 interprofessional domains with expertise in simulation, teamwork, team performance, interprofessionalism and/or assessment were invited to participate in the Delphi panel. Panelists were asked to rate, reword and generate additional items, and then to develop an assessment scale in an iterative process. The Delphi process continued until agreement was reached.

**Observation/Evaluation:** A total of 45 teamwork tools and 13 interprofessionalism tools were identified by systematic review. Each tool was reviewed by 2 research team members for extraction of items. A total of 157 items were extracted, and reduced to 85 discrete items for rating by Delphi panellists. Five rounds of surveys were completed with response rates ranging from 81% to 100%. The 85 initial items were reduced to 18 items that reached consensus (Figure 1). A global 5-point rating scale ranging from novice to expert with a minimum of 3 unique anchors for each item was developed (Figure 2).

**Discussion:** We used systematic literature review and Delphi methodology to develop a novel tool to assess interprofessional teamwork for individual trainees in a simulated setting. This is the first step to establish validity evidence necessary to use this tool for competency-based trainee assessment as envisioned by the ACGME Milestone project. Next steps include testing tool performance for assessment of individual trainees in simulated scenarios.

**References:**

**Image:**

**Figure 1: Final 18 items:**

1. Adheres to best practices during procedures
2. Communicates need for assistance as necessary
3. Accepts accountability
4. Introduces self by name and role
5. Identifies team leader
6. Contributes to team debriefing
7. Demonstrates calm during crisis
8. Shares mental model with team efficiently and concisely at the onset, and as change occurs
9. Shares an organized and efficient problem-solving approach
10. Communicates patient parameters and/or changes in clinical condition
11. Seeks advice and expertise of others
12. Effectively facilitates discussions and interactions among team members
13. Participates in a collaborative relationship with other team members
14. Practices active listening through closed-loop communication
15. Works with other team members to shift roles to address urgent/emergent events when appropriate
16. Listens respectfully to the expressed needs of all team members, including patient and family, in delivering care
17. Provides care in a way that is mindful of the patient and their family
18. Is open to opinions from other team members

**Figure 2: Example of Assessment Scale for Item: “Contributes to Team Debriefing”**

<table>
<thead>
<tr>
<th>Novice</th>
<th>Beginner</th>
<th>Competent</th>
<th>Proficient</th>
<th>Expert</th>
<th>Not Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not share information with the team.</td>
<td>Shares information with the team inconsistently.</td>
<td>Shares information with the team consistently.</td>
<td>Shares information with the team consistently.</td>
<td>Shares input freely and occasionally will offer new ideas.</td>
<td></td>
</tr>
</tbody>
</table>

**OP 01-4 – Code Response Training – Getting A Whole Hospital Up To Speed**

*Interprofessional Education (IPE)*

Submission ID: IPSSW2017-1071

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**Context:** Simulation for team training is a tool commonly considered by institutions. However, providing training to an entire hospital staff in a 4 month period is not easily accomplished. Our hospital asked the Simulation Program to develop and implement team training for over 2000 clinicians in order to meet a national hospital rating deadline.

**Innovation:** The problem demanded a multi-faceted approach to ensure the audience was engaged. Using adult learning principles, we developed 3 brief online interactive modules focusing on Patient Safety Fundamentals. After completing these modules, clinicians enrolled in a 1 hour interprofessional simulation with groups of up to 4 physicians and 8 nurses. Over four months, we provided training to approximately 2000 staff members with a core team of 6 simulationists and 10-12 additional facilitators. Each session was facilitated by a nurse and physician to emphasize the interprofessional nature of the work.

Clinicians participated in two simulations as part of an ad hoc team. One scenario was a toddler with airway obstruction and the second was a child with septic shock. The debriefing focused on the formation of ad hoc teams through introductions, statement of expertise, and role identification with a focus on common language and resource allocation.
Evaluations: Preliminary data reflect a positive response from participants to the training with over 1000 people trained in 109 separate sessions. The overall rating was 4.72 / 5 (SD: 0.55). For usefulness of the course, the rating was 4.34 / 5 (SD: 0.75). Other metrics are pending.

In evaluations, participants commented on several different themes: Accessing Resources, Team Functioning, and Communication. The verbatim comments from the participants provided the most insight into the benefit of the program. A few examples are:

- Having interdisciplinary training, which reinforced the importance of having closed loop communication and a shared mental model across the organization.
- The patient is the priority, his or her safety comes before any feelings or fears I may have. It is better to speak up and possibly be wrong than to stay quiet when harm could be done to the patient.

Discussion: Through the Code Response Training program, the Simulation Program achieved hospital-wide visibility and emphasized the importance of communication and teamwork in critical situations. This has also fulfilled the organizational goal for universal teamwork training. Implementation required engagement of hospital leaders, unit educators and division chiefs. The online learning platform enabled content delivery, data collection, evaluation management and further iterative course development. The platform was developed via a grant from the Accreditation Council for Graduate Medical Education. Training throughout an institution is a formidable task, but the current experience shows it is feasible with engagement, leadership, an online portal and broadly applicable material.

Image:

Arithmetic Mean 4.72 Standard Deviation 0.55

OP 01-5 - Evaluation Of A Simulation Augmented Emergency Triage, Assessment And Treatment Course In Malawi

Educational Outreach (including remote, rural and international simulation education)

Submission ID: IPSSW2017-1134

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Background: The Emergency Triage Assessment and Treatment (ETAT) course developed in Malawi 1 and rolled out in developing countries by the World Health Organization (WHO) 2 has significantly improved the mortality rates in children under the age of 5, however there is much room for improvement. Recent statistics indicate that the under-five mortality rate in low-income countries is still 11 times the average rate in high-income
countries; the WHO has articulated the need to strengthen the health workforce to improve quality of life, prevention and survival in children under 5 years of age. In Malawi the last 2 ETAT courses were delivered over 4.5 days; one day longer than the recommended course time (2008, 2013). Recently a simulation augmented ETAT course was delivered over 2.5 days. This change was introduced because of noted shortages of health workers, and challenges in training and retaining health workers. The change was achieved by shifting most of the learning from time consuming didactic to a simulation based format.

Research Question: Can Simulation-augmented ETAT be delivered in 2.5 days without compromising participant learning?

Method: First, to test the effectiveness of the Simulation-augmented ETAT course, pre- post-test scores were compared using a paired samples t-test. Next, the post-test scores from the Simulation-augmented ETAT course were compared against the post-test scores of the two previously delivered ETAT courses (2008 & 2013).

Results: There was a significant improvement in participants’ scores from pre-test (M=46.7, SD=14.63) to post-test (M=84.35, SD=8.69) (t=15.63, p<.0001). These results suggest that the 2.5 day Simulation-augmented ETAT course was effective in increasing participants’ knowledge. When post-test scores were compared to the 2008 and 2012 deliveries (both 4.5-day courses) using a single variable t-test, it was found that participants in the simulation-augmented ETAT course scored significantly higher than participants in 2008 (M=72.20, SD=8.62) (t= 4.49, p=.0003) and 2012 (M=73.8, SD = 6.06) (t= 43.502, p=.002).

Discussion/Conclusion: The integration of simulation into the existing ETAT course in Malawi reduced the overall duration of the course from 4.5 to 2.5 days without compromising learning; learning was significantly better than previous longer courses. A shorter course should improve capacity for training more health workers. Future work will focus on potential delivery of ETAT in modules, again to improve access to course for health worker whilst protecting clinical demands.

References:

OP 01-6 – What If This...Happens At Home? Simulation To Prepare Caregivers Of Medically Complex Children Educational Outreach (Including remote, rural and International simulation education) Submission ID: IPSSW2017-1077

Christie J. Bruno 1, Natalie McCawley2, Tiffany Simon2, Lindsay Johnston 1, Kelly Kadlec2
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Goal: Develop simulations specific to the unique needs and care of a particular medically complex child to prepare caregivers, first responders, and receiving institutions for emergency situations for medically complex children

Learning Objectives:
- Describe various conditions/issues often associated with a medically complex child
- Outline potential simulation benefits to caregivers, first-responders, and receiving institutions
- Design 1-2 simulation scenarios likely to be encountered for a particular medically complex child

Intended Audience: Educators, healthcare providers/professionals; Appropriate for any level

Relevance to the Conference: Workshop describes an effort between medical centers and the parents, first-responders and initial receiving institutions who will be the first to provide management for a medically complex child.
Workshop Timeline:

- **Introduction** (10 minutes)
  Faculty introduction, disclosures, informal poll regarding learner's comfort levels with emergencies in medically complex children

- **Background** (10 minutes)
  - Discuss typical attributes of a medically complex child
  - Parents of chronic and medically complex children may experience anxiety as they take on the care of their child who has frequently been managed by others.\(^1,2\)
  - Parental anxiety may impact confidence and ability to appropriately care for that child.\(^1,2\)
  - Medical providers may lack adequate familiarity and comfort with emergencies involving medically complex children.\(^3,4\)
  - Medically complex children disproportionately utilize the emergency medicine; optimal management of these children may decrease ER visits.\(^5,6\)

- **Interactive Session** (50 minutes)
  - Divide group into individual groups of 5-8 learners. Each group will be given an Emergency Information Form (EIF) downloadable from AAP. EIFs contain comprehensive, concise, medical information on a particular child. With the EIF, each group will design one simulation for either the caregivers at discharge, first-responders arriving on scene, or the initial receiving institution who is preparing to transfer the child to a tertiary/quaternary center. Each scenario should include method of simulation (e.g. task trainer, high-fidelity), general description of patient events, expected interventions and key learning points. (30 minutes)
  A group representative will present to the larger audience the scenario they have designed, including method, general description, expected interventions, key learning points as challenges in developing the scenario(s). (20 minutes)

- **Final Summary and Questions** (20 minutes): Review any concerns. Discussion may include: role of assessment/remediation in these simulations, particularly parents and first-responders of medically complex children.

References:


OP 02-1 – Rapid Cycle Deliberate Practice Training Improves Performance In Simulated Neonatal Resuscitation

**Debriefing and teaching methodologies**

Submission ID: IPSSW2017-1120

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**Background:** Rapid Cycle Deliberate Practice (RCDP), a simulation training technique, allows the simulation facilitator to provide debriefing throughout the session acting more as a coach. Also, participants work through the simulation scenario multiple times developing “muscle memory”.
**Hypothesis:** Do pediatric residents have improved observed abilities, recall, and confidence level in neonatal resuscitation after receiving RCDP teaching compared to traditional simulation methods using the Simulation Debrief Cycle (SDC)?

**Methods:** Perform a randomized control trial comparing two methods, RCDP vs. the SDC, of teaching neonatal resuscitation to 34 pediatric interns at Columbia University Medical Center. Each subject receives a teaching simulation session using either the RCDP or SDC. Immediately following the teaching simulation session the subjects undergo a videotaped simulation test. The subject’s performance on the videotaped session test is scored on the Megacode Checklist Assessment Form (MCAF) by two blinded Neonatologist. The subjects are retested and scored again 4 months from the initial teaching to determine if RCDP improved recall.

**Statistical analysis:** The subjects’ cumulative scores on the MCAF and the average time to perform critical interventions are compared between the two groups using paired t-tests. The cut-off times to perform critical interventions, confidence level and performance of harmful actions were compared using fisher exact tests.

**Results:** MCAF scores immediately following teaching were significantly higher in the RCDP group (89.41%) compared with the SDC group (84.12%). In accordance with the NRP recommendations, significantly more subjects in the RCDP vs. SDC group initiated positive pressure ventilation in less than 1 minute (100% vs. 71%), ventilated the patient prior to starting chest compressions (100% vs. 77%), and administered epinephrine earlier (152 secs vs. 180 secs). Learners self-reported increased confidence in neonatal resuscitation regardless of the teaching method. However, confidence did not correlate with observed abilities. All 34 subjects returned to complete the recall portion of the study and the data is currently under review.

**Conclusions:** Immediately following teaching, pediatric interns that underwent RCDP training had significantly improved observed abilities and decreased time to perform critical interventions in neonatal resuscitation simulation compared to those trained with the SDC.

**References:**

**OP 02-2 – Debriefing challenges in India: Experience from Pediatric Simulation Training And Research Society Debriefing and teaching methodologies**
Submission ID: IPSSW2017-1237

Vijayanand Jamalpuri, Sujatha Thyagarajan, Geethanjali Ramachandra, Rakshay Shetty, Amy Kline, Michael Shepherd, Vinay Nadkarni, Anne Ades

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**Introduction:** PediSTARS, India, is a national society formed to promote simulation-based training in pediatrics. Since 2013, Pedi STARS has conducted 35 workshops for 1300 delegates (1050 Doctors, 250 Nurses) across India. PediSTARS adopted a structured debriefing during the workshops. The objective is to characterize debriefing challenges and identify potential mitigation measures to address them.
Observations: Debriefing challenges identified were: 1. Experience with and preference for directive feedback – learners demanding ‘tell me what is right and wrong’ (plus-delta) 2. Language barriers 3. Strong hierarchical structure and practice – within and across professional groups 4. Difficulty with the “Emotions phase” with many Indian earners finding it difficult to express their feelings and 5. Skill mix of debriefing faculty.

The strategies adapted to address these challenges were:
- Training of Trainers (TOT): Pedi STARS conducted 3 TOT workshops and trained 130 doctors and nurses, especially senior faculty of academic institutions and PALS/NRP instructors, involving international experts.
- Advocating appropriate debriefing methods - sharing the debriefing template with all the faculty members and pre-briefing with every workshop, co-debriefing with senior faculty especially the novice faculty. Pedi STARS with the help of international simulation experts published a symposium on simulation based learning and debriefing in a national journal and conducted a national simulation conference with the theme of debriefing to demonstrate and promote appropriate debriefing methods.
- Creation of a WhatsApp group 2 weeks prior to every workshop and sharing the common fears and learning objectives to break the ice amongst participants and faculty.
- Creating psychological safety for the participants during the workshop: Faculty doing a mock scenario and demonstrating reflecting learning, debriefing in local language where necessary, involving the nurses actively and highlighting their positive attributes, involving the nurses as confederates.
- Reinforcing a debrief methodology that is very explicit about the medical facts of a case.

Conclusions: Debriefing in India is challenging due to cultural barriers. Several strategies have been applied to facilitate reflective learning amongst participants and faculty during simulation training. Further research is needed to understand the challenges and success of these strategies.

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OP 02-3 - Evolution Of Stress Response During Debriefing Of Repetitive Immersive Simulations Over One Year

Debriefing and teaching methodologies
Submission ID: IPSSW2017-1161

Aiham D. Ghazali* 1, Stéphanie Ragot2, Denis Oriot3
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Background: Stress increases during high-fidelity simulation (HFS). Few studies described stress response during debriefing. We showed that stress decreased during debriefing by good judgment after simulated laparoscopy [1]. However, there is no data on the evolution of stress response during debriefing after the repetition of HFS over a long period of time.

Objectives:
- To compare stress response during simulation and debriefing period;
- To analyze stress response during debriefing of repeated HFS over one year;
- To compare stress response between two groups that differed only by the rate of repetition.

Methods: IRB approval from the University Hospital of Poitiers, France, and INSERM-CIC 1402 (Research Institute). Single-center RCT whose methodology was published elsewhere (ClinicalTrials.gov registration number NCT02424890) [2]. 12 multidisciplinary teams (MDTs) of French EMS were recruited, including an emergency physician, a resident, a nurse, and an ambulance driver. MDTs were randomized in 2 groups to manage an infant shock in HFS. In experimental group 6 MDTs were exposed to 9 different scenarios over 1 year. In control group, 6 MDTs had only 3 scenarios that were common with the experimental group (initial, intermediate after 6 months and final after 1 year). A SimNewB (Laerdal*) mannequin was used. Each scenario was followed by a good-judgment debriefing. Evaluation of stress response included: heart rate (HR), heart rate variability (HRV with pNN50, LF/HF ratio), salivary cortisol (SC), and a psychological questionnaire (STAI). Parameters evolution over time was analyzed by ANOVA for repetitive variables. Comparison between the 2 groups during common sessions and between two times used a T-test. A p value < 0.05 was considered significant.
Results: Stress decreased between simulation and debriefing for all parameters (p<0.001). Evolution of stress response during debriefing in experimental group (9 sessions over 1 year) showed a decrease of stress level for all parameters. STAI score after debriefing decreased after the 5th session (F=4.31, p<0.0001). HR during debriefing decreased from the 2nd session (F=5.65, p<0.0001). HRV, LF/HF ratio also decreased (F=3.75, p=0.0004), whereas there was no variation for pNN50. Immediately after debriefing, SC decreased after the 2nd session (F=4.17, p=0.0001). There was no significant variation for the other parameters. Comparison with the control group (3 sessions over 1 year) showed similar variation during the 3 common scenarios with no significant difference.

Discussion/Conclusion: Stress response decreased during standardized debriefing with repetitive simulations regardless the rate of repetition of HFS. These results suggested that good-judgment debriefing might improve performance by providing a stress-free time for learners, in order to discover and close their gaps in performance with the help of a facilitator in a learner-centered approach.

References:
based learning objectives, and for system-based practice improvement. Anyone involved in patient care and simulation education will benefit from exploring this important topic.

**Workshop timeline:**
- Introductions of faculty and participants, workshop objectives, agenda, and assessment of learner’s experience with the topic (15 minutes)
- Background - Presentation of different clinical event debriefing methods from children’s hospitals across the country, including EC, ICU/floor, and the delivery room (Neo), including a review of the available evidence on debriefing clinical events (60 minutes)
- Small group sessions – at least 3 groups: (60 minutes)
- Group report back and comparison/discussion (30 minutes) consider flip charts. Hand out clinical debriefing planning sheet
- Final summary, conclusions, evaluations (15 minutes)

**References:**

**OP 02-5 - The Role of Simulation In Teaching New Nursing Staff How To Raise Concerns Using The Pace Structure**

**Patient safety and quality improvement**
Submission ID: IPSSW2017-1129

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**Context:** Hierarchy and leadership are essential within any multidisciplinary team. However, Errare humanum est – to err is human. Irrespective of their degree of seniority team leaders can make mistakes. It is important that everybody within the healthcare team feels confident that they can raise concerns to ensure patient safety.
This can be particularly challenging for new staff joining established healthcare teams. The Advanced Paediatric Life Support (APLS) Group recommend the PACE (Probe, Alert, Challenge, Emergency) method, initially adopted by the airline industry, as a structured approach for raising concerns.¹

**Description:** In order to improve the confidence of new nursing staff in raising concerns we introduced teaching on this topic into their induction simulation teaching. New nurses each undertook a clinical scenario in which the doctor was deliberately hesitant and reluctant to administer appropriate treatment. Teaching was then provided on the PACE method as a structure for raising concerns and before each nurse took part in a similar scenario, allowing them to practically apply the principles learned.

**Observation/Evaluation:** Prior to commencing the session we asked the 23 nurses participating to suggest on a likert scale how confident they would feel in challenging a nursing colleague or doctor if they had concerns about their practice (1 = not confident and 5 = very confident). Interestingly there was no difference in participants’ confidence between challenging a nurse or doctor with an average score of 3.4/5 for both. During the debrief following the first scenarios we asked participants how they felt. Nursing staff reported feeling ‘frustrated’ and ‘scared’. One stated ‘this sort of situation is my worst fear.’

Following teaching on PACE and the subsequent scenarios nursing staff stated that their confidence in raising concerns to nursing colleagues and doctors had increased to 4.3/5 and 4.2/5 respectively. Feedback on the session was very positive. Figure 1 depicts a Word Cloud generated from free text comments. Comments included:

- ‘Hearing first hand from doctors that they would rather be challenged than do something wrong was reassuring.’
- ‘Improved my confidence to speak up when querying a decision’
- ‘It will still be difficult to challenge seniors but PACE provides a useful framework to approach these situations.’

**Discussion:**

Nursing staff reported improved confidence in their ability to raise concerns. This can only serve to improve patient safety by reducing the incidence of preventable errors in the healthcare setting. Our experience demonstrates that simulation training is ideal for teaching a structured approach to the escalation of clinical concerns and we have embedded this PACE training within all our medical and nursing induction programmes.

**References:**


**OP 02-6 – Teaching Team Building To Enhance Healthcare Team Performance Using Simulation Education**

**Patient safety and quality improvement**

Submission ID: IPSSW2017-1087

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Overall Goals: Our workshop aims to enhance team performance in a health care organization using simulation education to reduce latent safety threats.

Objectives:
- Describe the team building principles adapted from TeamSTEPPS, AHRQ
- Practice team building principles using simulation-based scenarios
- Analyze team performances using a scripted simulation debriefing
- Determine the key team building strategies used to reduce individuals’ latent safety threats (LST)

Intended audience: health care providers, administrators, educators, technicians. This workshop is appropriate at all levels.

Relevance to the Conference: Building a functional healthcare team is critical to delivery of quality patient care. Effective team leadership and communication can build trust, reduce latent safety threats (LST) and enhance patient and employee satisfaction. Teaching team building strategies through the use of “hands on” practice and interactive discussion will demonstrate strengths and weaknesses in performances and provide skills and tools to enhance team building.

Workshop Timeline:
- Introduction: 15 mins
- Background 15 mins
- Interactive session/SIM: 45 mins
- Conclusion/Questions: 15 mins

OP 03-1 – Pediatric Simulation Instructors Workshop
Faculty development
Submission ID: IPSSW2017-1020

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Abstract Body: This workshop is designed to enhance the skills of the faculties as instructors/facilitators in the field of pediatrics. It is considered as advanced workshop which is not designed for the novices in simulation. Minimal background about simulation is required. The learners targeted are mainly the faculties of pediatrics and neonatologist while it is also useful for other health professionals. The goal is to enhance the skills of simulation mainly in the area of scenario design, theatre or stage preparation and the debriefing. The objectives of this workshop are basically three, considering the learners by the end of the workshop will: 1. Recognize the different skills required for the pediatric simulation instructors. 2. Perform hands-on tasks of scenario design, theatre preparation and debriefing. 3. Recognize the different tools of simulation experience assessment. The assessment tools of learning objectives of this workshop is pre and post workshop survey. This workshop is adapted from our full day workshop that I conducted in our institute (as a co-chair of pediatric simulation committee) with my colleague.

The following is the agenda of the full workshop:
Fundamentals of simulation Education (90 minutes)
- Simulation & Medical Education
- Inter-professional Education
- Basics of simulation
- Working in Simulation
- Theater Preparation

2. Creation of the Play (90 minutes)
- Curriculum development
- Needs Assessment, goal & Objectives
- Scenario design
OP 03-2 – Simulathon – Pediatric Trauma Simulation Training In-Situ Across India

Faculty development
Submission ID: IPSSW2017-1263

Sujatha Thyagarajan* 1, Geethanjali Ramachandra2, Rakshay Shetty1, Vijay Jamalpuri2
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Context: Simulation training workshops conducted by PediSTARS (Pediatric Society for Training and Research in simulation) India over the last year identified a gap in the knowledge of having a structured approach to assessment of pediatric trauma. PediSTARS organised a nationwide pediatric trauma simulathon on world trauma day to encourage the simulation trainers across the country to conduct in-situ pediatric simulation training. We share the results of an online survey to the simulation trainers about the target audience, gaps in training and the challenges and acceptance of simulation based training.

Methods: Simulation trainers across the country trained through PediSTARS Training or Trainers workshop were approached via email and WhatsApp group. All the interested simulation trainers were sent a trauma scenario which could be modified to local training needs. All centres conducted the training session on world trauma day-October 17th, 2016 and shared their experiences and photos of the session on the WhatsApp group. An online survey to collate the experience was sent to all the simulation trainers.

Results: 20 centres across India participated in the Simulathon. The target audience varied from Emergency nurses and doctors, paediatricians, under graduate and post graduate students, and parents. All centres uniformly identified gaps in knowledge of initial assessment and primary survey of pediatric trauma, skills such as needle thoracocentesis and team leadership. All centres uniformly reported 100% acceptance of simulation based training and the need to have more such training sessions locally to enhance their learning experience. The challenges described by the simulation trainers include time and equipment constraints for regular simulation training locally.
**Conclusions:** Pediatric trauma training is a much needed and wanted aspect of training that can be addressed via simulation in-situ successfully. A thematic approach such as a simulathon can encourage trainers to conduct sessions more regularly.

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**OP 03-3 – Designing A Train-The-Trainer Faculty Development Course In Simulation For A Developing Country**

*Faculty development*

**Submission ID:** IPSSW2017-1056

Elaine L. Sigalet* 1, Faizal Haji2, Ian Wishart3, Adam Dubrowski4

1Faculty of Nursing, University of Calgary, Doha, Qatar, 2Neurosurgery, Western University London Health Science Center, London, 3Emergency Medicine, University of Calgary, Alberta Children's Hospital, Calgary, 4Faculty of Medicine, Memorial University, St Johns Newfoundland and Labrador, Canada

**Abstract Body:** Improving training of health workers in developing countries is challenging but necessary to improve healthcare delivery for sick children. However, improving health worker training is challenging due to constraints on time, knowledge and resources. Simulation based learning may provide a platform in addressing these issues by (a) fostering critical thinking, closing performance gaps, and linking practice with existing resources, (b) increasing skill development through a shift from didactic to experiential learning, and (c) shortening course time. However the use of SBL is hampered by limited faculty knowledge and skill related to simulation pedagogy (1). In this workshop, we describe our recent successful implementation of a train-the-trainer (TTT) course based on mastery learning principles to facilitate faculty development in SBL in Malawi. Throughout all phases of our course, participants are given learning objectives, facilitator notes emphasizing key concepts and tips for achieving the desired outcome, expert modeling of concepts like breaking skills into appropriate steps for teaching purposes, opportunities for hands on learning, and multiple opportunities to demonstrate application of relevant concepts (2-4). Lesson learned and ongoing challenges related to educational interventions in a developing country will be discussed.

**Overall Goal of the Workshop:** Provide a template and opportunity for attendees to participate in a TTT course designed to teach simulation pedagogy in a low-resource setting.

**Learning Objectives:** By the end of 90 minutes attendees should be able to:

1. Identify key simulation concepts and their relevance in developing countries
2. Develop a TTT outline using principles of mastery learning inclusive of learning objectives, facilitator notes, tips for success, expert modeling, hands-on learning, and multiple opportunities for deliberate practice to close performance gaps
3. Identify relevance and challenges of such efforts in a low resource setting

**References:**


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**OP 03-4 – Too Little, Too Much, Just Right: Right Sizing An Initial Instructor Development For Your Program**

*Faculty development*

**Submission ID:** IPSSW2017-1213

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Goal: Build an agenda with objectives to meet various time allotments for an initial simulation instructor course.

Learning Objectives:
- Identify key objectives for inclusion in an initial simulation instructor course,
- Prioritize objectives based on available time to conduct an initial simulation instructor course.
- Develop an agenda to meet the needs of the program for an initial simulation instructor course.

Abstract: Engaging faculty and instructors on how to teach with simulation is critical to the success of any simulation program. However, there are often issues with time constraints, available protected time, and workload that limit how long a course can be offered for initial simulation instructor education courses. This workshop will use the agendas and learning objectives for two long-running instructor courses with the major difference between the two being time dedicated to the course: one with a two-day agenda and the other with a five-day agenda. Using these courses as reference points, participants will analyze objectives, set priorities for what can be taught in each time frame ranging from one to five days, and budget subject matter time for each duration agenda. Both faculty for this workshop have extensive experience with online education and will guide discussion on incorporating educational innovations such as distributed learning and the “flipped classroom” to work around time issues required for conventional in-person courses to help mitigate time constraint issues.

Timeline:
- 00:00-00:08 – Introductions, Overview, Objectives
- 00:08-00:12 – Review of the supplied instructor course agendas and objectives
- 00:12-00:20 – Group exploration of additional objectives for inclusion
- 00:20-00:35 – Prioritizing objectives using a group multi-voting technique
- 00:35-01:05 – Group work on building an agenda for a specific time frame (Each table will be assigned to develop either a 1-, 2-, 3-, 4-, or 5-day course)
- 01:05-00:15 – Report out and discussion
- 01:15-01:25 – Discussion on innovations to maximize use of of in-person time
- 01:25-01:30 – Conclusion

References:

OP 03-5 – The P-LHET: A Novel Approach To Designing Simulation-Based Education Sessions
Faculty development
Submission ID: IPSSW2017-1191

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**Goal:** The goal of this interactive workshop is to familiarize participants with the P-LHET as an alternative approach to education session design, and to guide them through the process of developing simulation-based sessions while considering the principles of adult learning, on which the P-LHET is based.

**Learning Objectives:**
- Recognize the P-LHET as an alternative approach for developing simulation-based education sessions.
- Identify how the P-LHET utilizes principles of adult learning.
- Design a simulation-based education session using the P-LHET.

**Background:** Kern’s 6-step approach\(^1\) has evolved as the most widely used method for curricular design. This cyclical process is an effective approach to designing entire curricula, however, it can be cumbersome and often not practical for the design of single education sessions. We propose the P-LHET model (Preparation, Linking, Hook, Engagement, Transfer)\(^2\) as a simpler, more pragmatic, step-by-step approach to the design of single education sessions. The algorithm, grounded in principles of adult learning, was developed by educators at George Washington University, and has been used successfully to develop histology lab and simulation-based education sessions.\(^2\)

**Workshop Timeline:**
- Introductions: Agenda, disclosures, objectives, handouts, needs assessment. (5 min)
- Large group discussion: Audience experience with Kern's 6-step approach. (5 min)
- Small group activity: Each group discusses application of one of three principles of adult learning (on which P-LHET is based), followed by report out to the large group. (10 min)
- Small group activity: Each group identifies a topic, intended learners, and develops 2 learning objectives. (10 min)
- Brief presentation: Introduction to P-LHET and practical examples. (10 min)
- Small group activity: Participants develop an educational session (considering their learners and developed learning objectives) using the P-LHET, followed by report out to large group. (40 min)
- Large group discussion: Modeling of P-LHET - how P-LHET was utilized to develop the workshop. (5 min)
- Summary, questions: (5 min)

**Intended Audience:** Educators, clinicians and simulationists. Intermediate level.

**Relevance to the Conference:** The P-LHET is a pragmatic tool that can be used by educators, faculty and simulationists for the design of simulation-based sessions. It is easy to use and is applicable irrespective of the learner level and degree of complexity.

**References:**

**OP 03-6 – New Techniques for Rapid On-Boarding of Simulation Engineers**

**Process Improvement and organizational change**

Submission ID: IPSSW2017-1261

Katie Fitzpatrick\(^1\), Katherine Jamieson\(^1\), Gena Koufos\(^1\), Christopher Roussin\(^1\), Kaitlyn Nogueira\(^1\)

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**Context:** Evolving and rapid adoption of safe experiential training and preparedness in health care has driven a growing number of simulation centers to hire dedicated technical staff capable of delivering increased volume and complexity of simulations.\(^1,2\) Traditional methods of onboarding – include observation and apprenticeship - are limited by availability of cases and mentors leading to long “ramp up times” to full competency as well as need for large bandwidth of existing staff. To address these challenges, BCH SIMPeds has successfully transitioned from a traditional apprenticeship type model to a timesaving graduated step-wise training program.
for more rapid and complete onboarding of new “SIMDelivery Engineers”. This program is an evolution of over 10 years of onboarding and training of SIMDelivery Engineers.

**Description:** A graduated step-wise training approach begins with achievement of baseline knowledge and skills prior to completing the onboarding process including:

- **Mannequin Setup, Operation, Maintenance and Troubleshooting**
- **Simulation Lab Setup, Operations, Maintenance and Troubleshooting**
- **In-Situ Simulation Setup, Operations, Maintenance and Troubleshooting**
- **Use of Standard Medical Equipment/Supplies**
- **Audio Visual Use**
- **Engineering/Advanced Troubleshooting**

In order to implement this we utilized a 3-step approach:

1. **Focused Observation** – Engineers were assigned to observe simulation in a directed fashion. The purpose of this was to identify inherent challenges and to create relevancy to the content in the specific knowledge areas listed above.
2. **Hands on Training** – This is a specified curriculum based on the knowledge areas that are included in our baseline.
3. **Formal Signoff** - The signoff includes a skills based checklist that codifies the basic abilities required to run simulations.

**Observation/Evaluation:** These efforts have resulted in a 50-60% reduction in average onboarding time from 4-6 months to 2 months, enabling decreased operational strain on veteran staff as well as increasing the pool of available engineers to run highly complex simulations.

**Discussion:** When applied to the onboarding of SIMDelivery engineers, a graduated step-wise training program decreases onboarding time for technical staff. This strategy enables the delivery of uninterrupted and high quality simulated experiences. Future initiatives will focus on the development of training methodologies enhanced by on-line asynchronous learning with a goal of further decreasing overall onboarding time for new hires.

**References:**


**OP 04-1 – Lights, Camera, Action! Exploring the Frontier of Simulation and Film Making**

**Innovation/ Future Direction and Outreach Simulation**

Submission ID: IPSSW2017-1256

Donna Luff* 1, Eric Stange2, Peter Frumkin2, Lewis Wheeler3, Elaine Meyer1

1Institute for Professionalism and Ethical Practice, Boston Children’s Hospital, 2Spy Pond Productions, 3Independent Actor, Boston, United States

**Overall Goal:** The workshop will introduce participants to the potential to increase the scalability of experiential learning at the interface of simulation and film making. The Institute for Professionalism and Ethical Practice at Boston Children’s Hospital has partnered with professional filmmakers and actors to create films featuring improvised simulation of difficult conversations in healthcare. Our innovative approach includes minimally-scripted case enactments in which clinicians and professional actors improvise conversations, rather than using standardized patients. We also conduct a structured post-enactment ‘debrief’ between clinicians and actors. The resulting films have been used to increase the scalability of our approach to relational and communication training, including through online courses. We will outline our approach, with examples of film projects from concept through filming to curriculum integration. Participants will have an opportunity to brainstorm ideas for their own film projects and gain immediate feedback from actors and filmmakers. They will leave the workshop with a “production manual,” for their own experiential simulation films.
Learning Objectives: By the end of the workshop, participants will be able to:
- Appreciate the potential of an innovative approach to filmmaking and simulation.
- Recognize filmmaking opportunities to showcase, enhance, and scale simulation education in their own areas of interest
- Identify their next steps for film development

Intended Audience: Interprofessional simulation technicians, educators and administrators who would like to learn more about the potential of filmmaking to enhance their simulation capacity and scalability; basic to intermediate level of knowledge.

Relevance to the Conference: Blending improvised simulation and filmmaking has the potential to enhance innovative learning on communication and relational topics, and to amplify the impact and scalability of simulation.

Timeline:
- Introductions (10 minutes)
- Case Example (25 minutes): Film project/s review with video-clips, analysis of character/case development, details of on-the-day filmmaker, actor, and clinician interaction, and post-production.
- Interactive Session 1 (30 minutes): Small group brainstorm of film ideas - actors, and filmmakers to give feedback on all aspects of projects, from concept to practical needs, to generate feasible film projects.
- Interactive session 2 (15 minutes): Worksheet on next steps for film development – take home “production manual.”
- Final Q & A (10 minutes)

OP 04-2 – When A Child Dies. Simulating The Death Of An Infant: Key Practical And Communication Skills
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1141

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1Clinical Simulation Centre, 2Bereavement Services, 3Histopathology, 4Chaplaincy, Great Ormond Street Hospital NHS Foundation Trust, London, United Kingdom

Context: A pilot course has been launched addressing a recognised learning need in both the technical and non-technical skills of end-of-life care. Following feedback from bereaved parents, a deficit of knowledge in terms of communication has been identified. Scoping views of health care professionals confirmed this view, also anxiety about rarely used practical skills. This is compounded by the anxiety wanting to ensure the ‘best version of the worst day’. Using simulation to recreate this ‘day’ is novel and addresses a recognised learning need1.

Description: The pilot was a half day course based on one scenario with several steps. An actor played the role of mother. Scenario: care had been withdrawn on the baby after failed cardiac surgery. The baby was baptised in the HDU, died and was transferred to the mortuary. All steps took place in real time. The learning outcomes were; practical care of a baby when death is imminent, and afterwards; care of and communicating with parents; legal aspects of certification and communication with multiple teams about the death; spiritual needs (this will be adapted to differing cultural and spiritual needs) and human factors, self-awareness during this process and support for staff. This was co-designed between the Clinical Simulation Centre and Bereavement, Chaplaincy and Mortuary Services. Supplementing the traditional debrief, breaks to pause and examine aspects of care allowed candidates and faculty to address concerns: this was due to the highly emotive scenario. There was also a concluding debrief.

Evaluation: Candidates fed back verbally via a series of posed questions to frame the debriefing, facilitated by Chaplaincy. This yielded words such as emotional, enlightening, powerful, intense and honest. This was followed by a formal, qualitative evaluation: feedback indicated a sense of preparedness, lessened anxiety and
empowerment. None of the candidates had prior experience of end-of-life care. Follow up will be undertaken to gauge the impact of this intervention following experience of a child dying.

**Discussion:** In implementing this pilot course, significant learning needs have been met for a small number of candidates (n.3). In particular, the experience of talking to and supporting a grieving parent. The innovation met the anticipated learning objectives, with adaptations around the length of the day and breaks highlighted as changes to be made. Learners and faculty, in particular the actor as Mother, expressed the need for a whole day course to allow more time to explore issues and allow breaks due to the highly emotive nature of the day: this will be built in to future course design. This course will be run 3 times per year as part of a simulation-based palliative care programme. This is an innovative approach for simulation and provides useful and much needed education to those providing end-of-life care.

**References:**

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**OP 04-3 – Can We Scale Communication Training Online? Web-Based Workshops On Disclosure And Apology**

*Multimedia, e-learning and computer-based instruction*

Submission ID: IPSSW2017-1251

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**Context:** Disclosure following medical error and adverse events is one of the most challenging conversations for healthcare professionals, yet most have little or no training. The Institute for Professionalism and Ethical Practice (IPEP) has conducted daylong, in-person educational workshops for clinicians to enhance communication and relational skills for Disclosure and Apology (D&A). Since 2014, IPEP has developed innovative faculty-moderated, online D&A simulation workshops to offer such training to larger numbers of clinicians than could be trained in person.

**Description:** We developed a three-part online Disclosure and Apology course, which offers: two self-guided learning pathways containing stories from patients, families, and providers about their experiences of medical errors, presentations and, downloadable resources; and, a unique third part being a 2-hour interactive workshop, facilitated by expert faculty within an online video chat room. The workshop features whiteboard exercises and the opportunity to watch and discuss filmed enactments of a clinically realistic disclosure and apology scenario. We were interested in the feasibility and acceptability of interactive, simulation training on such a sensitive communication topic within an online workshop.

**Observation/Evaluation:** We analyzed data from two exercises in three pilot online workshops. An “Advise a Colleague” whiteboard exercise prompted participants to share what they might say to a colleague in preparation for a D&A conversation. As a comparison, data from this activity in two in-person workshops was assessed. We also analyzed data from the “Take Homes” whiteboard activity during which participants reflected on their learning. These activities were selected due to the core content topic area of the first and the indication of the feasibility of the online format in the second. Content analysis was used to categorize responses. For the “Advise a Colleague” exercise, desired learning concepts emerged equally in both online and in-person workshop settings. In the “Take Homes” exercise, despite initial technical challenges, by the last pilot 91.7% of responses were positive on both educational value and participant experience of the online format.

**Discussion:** Our experience and observations suggest that equivalent learning may be achieved by simulation exercises in a moderated online workshop format as an in-person workshop. The evaluation of the pilot workshops indicated that online workshops may be a credible and feasible alternative to in-person workshops on Disclosure and Apology. Subsequent analysis of the first five live online workshops further suggests that new or enhanced learning opportunities are offered by participation online, such as exposure to cross-institutional and cross-cultural perspectives. Online educational formats may enhance the scalability and accessibility of simulation on patient safety and difficult communications to a broader audience.
OP 04-4 – New UK National Advanced Neonatal Resus Course. Novel Assessment, Human Factors, Smart FMV Trainer

*Simulation technology (including novel adaptations of current mannequins, technology, and hardware and/or software, or the development of new hardware or software for simulation-based education)*

Submission ID: IPSSW2017-1073

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**Abstract Body:** Attendees will learn about:

- development, roll out and impact of a new national (UK) advanced neonatal resus course - Advanced Resuscitation of the Newborn Infant (ARNI) Course.

And the novel elements of this course:

- emphasis on human factors and communication
- use of new system that gives personalised feedback on individual mask ventilation (FMV) technique: the Standardised Measurement of Airway Resuscitation Training (SMART) System
- new candidate assessment methods that particularly relate to assessing human factors and communication by assessing technical and non technical skills. Assessment that blends a scoring framework and an outcomes based continuous assessment will be described.
- Unsuccessful resuscitation and communication after a death
- communication - candidates taking roles of care givers and parents

Attendees will have hands on practice on the SMART system and receive personalised written feedback on their own FMV technique in terms of mask leak and respiratory parameters.

This workshop is suitable for all individuals and disciplines who provide neonatal care. The SMART session is relevant to any individual who is expected to provide FMV for a baby. Educators will be interested in the course development process, impact and novel assessment. 20 attendees/workshop.

**Timeline:**

Total -90 minutes

- Presentation- 30 minutes
  - Introductions/ disclosures / objectives /agenda – 5 mins
  - Development and national roll out with the Resuscitation Council UK - 5 mins
  - Novel elements of course as above 15 mins
  - Impact of the course – 5 minutes
    - Live demonstration of SMART System and hands on practice – 45 minutes
  - Demonstration of objective and immediate feedback on neonatal face mask ventilation through identification and measurement of mask leak using the SMART System. The SMART system was designed for the ARNI course; it allows each attendee to modify their face mask ventilation technique to reduce mask leak by practicing with different masks and holds on modified mannequins of both preterm (25 week) and term infants . The SMART software displays typical respiratory function waveforms - pressure, flow and volume. Easy to read scales enable the user to examine delivered positive pressure ventilation and its variation on a ‘breath by breath’ basis. The system does not require the user to be familiar with respiratory waveforms as mask leak is simultaneously presented numerically and with graphics of a smiley, neutral or sad face. Attendees will be divided into 2 groups of 10 - 2 SMART systems and instructors will be available. Each attendee will receive written feedback on which techniques work best for them.
  - Summary and questions - 15 minutes

OP 04-5 – Assessment of Virtual Support of Cardiopulmonary Resuscitation Using a Checklist

*Patient safety and quality improvement*

Submission ID: IPSSW2017-1215

Nnenna O. Chime* 1, Kareen Jones2, Katherine Steffen3, Corina Noje1, Jordan Duval-Arnould1, Elizabeth A. Hunt1, Kristen Nelson McMillan1
Hypothesis: The literature suggests that greater than eighty percent of critically ill children first present to community hospitals necessitating transport to a Children's Hospital and/or virtual support via telephone during time sensitive emergencies like cardiac arrest. The quality of cardiopulmonary resuscitation has been associated with clinical outcomes. Quantitative end tidal carbon-dioxide has been identified as a surrogate marker for cardiac output and a low number (<20) may signify poor quality chest compression and an opportunity to improve cardiopulmonary resuscitation. We hypothesize that the use of a scripted transport call checklist will prompt the request for quantitative end tidal carbon-dioxide monitoring, providing the opportunity to diagnose and improve poor quality cardiopulmonary resuscitation.

Methods: Second and third year pediatric critical care fellows were presented with a simulated scenario of a transport call for assistance in running the code of a 14-year-old male following a witnessed cardiac arrest. The fellows were randomized to two groups, one group with a checklist and the other group without a checklist. The sessions were videotaped, data was abstracted and preliminary descriptive analysis performed using Stata.

Results: We have analyzed data of 24 fellows. Eighty-three percent of fellows requested at least one surrogate measure of quality cardiopulmonary resuscitation. Only 63% of fellows requested the end tidal carbon-dioxide as a quality measure. Of these fellows, 53% gave directives to maintain the end tidal carbon-dioxide > 20. Fellows using the checklist were statistically significantly more likely to request for end tidal carbon-dioxide (p ≡ 0.004) and more likely to give directives to maintain end tidal carbon-dioxide >20 (p ≡ 0.03).

Conclusions: Fellows using the checklist were more likely to request for surrogate measures for quality cardiopulmonary resuscitation and subsequently more likely to provide recommendations and maneuvers to improve the quality of cardiopulmonary resuscitation during the transport call.

OP 05-1 – Simulation Based Team Training Improves Non-Technical Skills Amongst Pediatric Intensive Care Staff Interprofessional Education (IPE)

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1Pediatrics, Critical Care, Children's Healthcare of Atlanta at Emory University , 2Pediatrics, Emory University , 3Pediatrics, Children's Healthcare of Atlanta at Emory University, Atlanta, United States

Background: Simulation training is a strategy and learning tool that facilitates collaboration and improved communication among interdisciplinay teams. It improves competence with team functions to decrease patient risk and improve patient outcomes.

Objective: The purpose of this study was to evaluate if interdisciplinary training focused on team performance improves teamwork behavior during simulation training.

Hypothesis: Team performance amongst PICU staff progressively improves during simulation training.

Methodology: 166 staff members including PICU attendings, fellows, nurses, and respiratory therapists participated in a 3-hour simulation workshop which focused on improving team communication, role identification, role clarity, and situational awareness. The workshop consisted of 3 scenarios; septic shock, bronchospasm, and pulmonary hypertension with cardiac arrest. Each scenario was followed by a debriefing. Debriefings were modeled after the PEARLS blended approach and were co-facilitated by a PICU physician and a simulation coordinator. Simulation coordinators and participants used the Clinical Training Scale Tool (CTS) to assess each simulation scenario. This is a validated assessment tool for learner performance in simulation. It delineates 5 categories; communication, situational awareness, decision making, and role responsibility on a 10 point Likert scale (0; unacceptable, 10; perfect). Rater reliability using the CTS was assessed using the intra-class correlation coefficients (ICC) with associate 95% confidence intervals. Generalized estimating equations and paired comparisons were used to assess changes in scores across scenarios.
Results: 166 participants completed the CTS evaluation tool over 28 simulation sessions. Amongst facilitators, concepts such as closed loop communication, directed communication, role clarity and transparent thinking showed the highest reliability (ICC>0.80). Participant’s overall teamwork performance rating increased significantly across scenarios, with a mean (standard error) of 6.4 (0.17) in Scenario 1 to 8.5 (0.11) in Scenario 3 (p < 0.001). Individual scores in overall communication (Scenario 1: 5.8 (0.17); Scenario 3: 8.3 (0.11)), situational awareness (Scenario 1: 6.0 (0.18); Scenario 3: 8.3 (0.13)), and role clarity (Scenario 1: 6.1 (0.19); Scenario 3: 8.5 (0.15)) increased significantly during training (P<0.001). Similar trends in overall performance were also reflected in scores rated by the simulation facilitators; (Scenario 1: 4.8 (0.20); Scenario 3: 7.1 (0.24), p<0.0001).

Discussion: This is a large scale simulation initiative focused on teaching team performance concepts to multidisciplinary PICU staff. Results show that simulation can effectively be used to teach teamwork skills and that teamwork behaviors progressively improve throughout simulation training. Future research is needed to determine if these changes in teamwork behaviors are translated into clinical practice at the bedside.

Image:

![Image](image_url)

References:


OP 05-2 – Getting Teams ‘On The Right Trach’: Developing An Inter-Disciplinary Tracheostomy Course
Interprofessional Education (IPE)
Submission ID: IPSSW2017-1099

Nia Williams* 1, Caroline Davison2, Atefa Hossain1, Morwenna Nicholl3
1Paediatrics, 2Paediatric Intensive Care, St George’s University Hospital, 3Paediatrics, St Helier Hospital, London, United Kingdom

Context: The NCEPOD report ‘On the Right Trach’ highlighted a 25% complication rate in patients with tracheostomies which led to measurable harm in 60-70% of patients1. The report stresses that many adverse outcomes are potentially preventable and it goes on to highlight areas in need of improvement. Great importance is placed in the report on regular inter-disciplinary training, the benefits of which have long been recognised within healthcare education and simulation2. Recent studies have highlighted a gap in the knowledge of medical and nursing staff in tracheostomy management3-5.
We present our experience of developing and evaluating an inter-professional mixed modal tracheostomy course.

Description: St George’s PICU staff worked collaboratively with an inter-disciplinary team of specialist nurses and simulation centre staff to develop an interactive study day for healthcare professionals on caring for children with tracheostomies. Paediatric nursing and medical staff were invited to participate, whether they worked in critical care or on the general wards. Faculty was made up of specialist nurses, speech and language therapists, paediatric ENT surgeons, paediatricians and intensive care doctors. The day consisted of interactive lectures followed by small group simulation workshops. Topics covered in interactive lectures included: Anatomy and physiology, Surgical formation and complications, Tracheostomy tubes and accessories, Speech and feeding assessments and Emergency algorithms. Small group simulation workshops included: Secretion management, stoma care and securing tapes and Clinical emergency scenarios.

Evaluation: 16 medical professionals attended the study day. All participants completed a pre and post course questionnaire including a 5 point Likert scale rating their experience of each taught session. Overall, 50% of participants rated the individual sessions as excellent, 36% as good, 13% as adequate and 1% as poor. The most popular sessions were the emergency algorithm and tracheostomy tube sessions and the clinical simulation scenarios. Free text comments were analysed into themes using a pragmatic approach to framework analysis. The commonest mentioned learning points were around the emergency algorithm, followed by practical issues such as the difference between types of tracheostomy tube and the use of stay sutures. Areas for improvement suggested by candidates included reducing repetition in lectures and shortening the speech and feeding session.

Discussion: This project demonstrated that a mixed modal training programme on paediatric tracheostomy emergencies can be successfully delivered by an inter-disciplinary team to an inter-disciplinary audience. Feedback suggested that interactive simulation in interdisciplinary groups was the most popular method of teaching delivery. Participant feedback will be incorporated into the forthcoming courses and evaluation will be ongoing.

References: [References listed here]


OP 05-3 – Creating Neonatal Inter-Professional Simulation Instructors’ Taskforce To Improve Patient Care Interprofessional Education (IPE)
Submission ID: IPSSW2017-1031

Natalya Kusheleva*, 1 Annette Pope-Lydon2, Dyane Cavagnaro-Irvine 2, Marian Martin3, Heidi Baer1, Michael Skari2, Colleen Duffy4, Doreen Vuotto3

1 Patient Safety Institute, 2 Neonatal Intensive Care, 3 Staff Development, 4 Labor & Delivery, Northwell SIUH, Staten Island, United States

Abstract Body: The success of simulation training is heavily influenced by the availability of knowledgeable and engaging instructors. This workshop highlights the process of creating a multi-professional neonatal hospital based simulation instructor taskforce. Attendees will leave with methodology implementing these changes with the goal of positively impacting patient safety at their institutions.

Objectives: Identify and recruit stakeholders to strengthen neonatal simulation education
Brainstorm ideas on overcoming barriers of Inter-Professional Education (IPE) and training
Construct a roadmap for building an interdisciplinary simulation instructors’ team
Design curriculum for training and maintaining educators’ status

Methods:

- Interactive Needs Assessment: The audience will be asked to brainstorm on the specific categories of the educational process relevant to the delivery of maternal child IPE and training. The data will be categorized on the display boards titled: Who are your educators in the neonatal area? What are your methods of teaching NRP? What are your methods of maintaining neonatal skills? Who are your learners? When do you deliver this education? 1,2

- Small Group: Barnstorming interactive solutions & building strategies for IPE. The most common ideas and pitfalls from each group will be shared. Proctors will guide the discussion from issues raised by the participants. Strategies will focus on: Challenges & benefits for IPE & learning, simulation training modalities, curriculum for training and maintaining educators’ status.3

- Video Presentation: Examples of venues of the neonatal simulation training.4

- Small Group: The workshop will conclude with small group activities focusing on construction of curriculum for training and maintaining educators’ status (i.e. in-service regarding elimination of meconium suctioning) 5, 6

Intended Audience: Clinicians, educators, & administrators. Intermediate level.

Relevance to the Conference: This workshop provides creative strategies on how to recruit, educate and maintain multi-professional simulation faculty. The foundation of these strategies will aid in building simulation training in NRP, as well as other clinical areas, to ultimately provide better patient care.

Workshop timeline:

- Introduction & Background, Ice breaking (15 min)
- Main Topic (65min )
- Identify and recruit stakeholders for neonatal simulation instructors’ taskforce – Large Group (15min)
• Brainstorm ideas on overcoming barriers of IPE and training - Small groups (15 min)
• Video demonstrations for simulation education venues (5 min)
• Construct a roadmap to build interdisciplinary simulation instructors’ team. (25 min)
• Small group activity on applying learned strategies (10 min)
• Conclusion and questions (10 min)

References:

OP 05-4 – Plan, Learn And Care Together - Developing Pediatric Interprofessional Simulation-Based Education

Interprofessional Education (IPE)

Submission ID: IPSSW2017-1164

Beverley Robin* 1, Laura Meltzer1, Lynette Richter2, Joanna Kuppy1, Katherine Schaefer2, Christopher Bruti3, Elizabeth R. Van Opstal3

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Goal: For participants to recognize the importance of, and learn strategies for, interprofessional collaboration in the development and implementation of interprofessional simulation-based education (IPSBE) programs.

Learning Objectives:
• Recognize the importance of interprofessional collaboration in the development and implementation of IPSBE to address learners’ competing and complementary needs.
• Develop strategies for incorporating IPSBE programs into curricula.
• Identify barriers to the development and implementation of IPSBE and recognize opportunities for interprofessional education.

Background: Interprofessional education (IPE), in which students from two or more different professional disciplines learn about, from, and with each other1 is important to health professions education because IPE improves teamwork2, 3 and patient outcomes.4 IPE is especially important in pediatric education because competition for pediatric clinical sites5, patient safety concerns6 and shorter hospital stays7 limit opportunities for students to work in interprofessional teams. Despite significant benefits, the development and implementation of IPSBE is challenging. In this interactive workshop we review strategies for developing and incorporating IPSBE into curricula; identify barriers to, and opportunities for IPSBE; and based on our collaborative interprofessional experience, highlight the importance of employing an interprofessional approach to the development of IPE in order to develop sound programs that meet the needs of all learners

Workshop timeline:
• 10 min Introductions, needs assessment, divide into interprofessional groups
• 10 min Small group activity: Define IPE, identify 3 barriers and solutions to IPSBE
• 10 min Group report back
• 5 min PowerPoint: Key role of interprofessional collaboration in the development and implementation of IPSBE
• 10 min Small group activity: Develop two learning objectives for a pediatric IPSBE program, recognizing learners’ competing and complementary needs
• 10 min PowerPoint: Opportunities and strategies for developing IPSBE
• 20 min Small group activity: Groups exchange learning objectives and determine how they would develop and implement one other group’s objectives
• 10 min Group report back
• 5 min Wrap up/Questions

**Intended Audience:** Pediatric faculty, clinicians and educators who have an interest in developing IPSBE programs. Intermediate level.

**Relevance to the Conference:** This workshop is in line with the conference theme and will provide participants with strategies for the interprofessional development of IPSBE programs aimed at meeting the needs of all learners, with the ultimate goal of enhancing patient care.

**References:**

**OP 05-5 – IPSS Simulation Fellowship: Process Of Development**

_Programme development/ Administration and Program Management_

Submission ID: IPSSW2017-1170

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**Context:** International Pediatric Simulation Society Research and Education committees have been working on developing a Simulation Fellowship program to meet the needs of our members and provide a curriculum framework for standardizing core requirements for a Simulation Fellowship program.

**Description:** A fifteen question survey was designed by Research committee to seek input from members of Research and Education committee. The questions focused on duration of fellowship, elements of training, collaboration with existing programs, mentorship and value of such fellowship program.
Observation/Evaluation: There were 23 responses from 30 members. Majority of members (74%) preferred duration of fellowship to be 2 years. Completion of a structured educational curriculum and a scholarly project, and presentation at IPSSW were considered mandatory components by most. Core curriculum elements, research methodologies and simulation topics were asked to be rated as mandatory, desirable or optional. Commitments from a fellow’s institution supporting the fellow with protected time and resources for attending IPSSW were felt to be very important. Interest in mentorship and development of curriculum and milestones for tracking fellows’ progress and assessment tools were sought.

Discussion: The survey results regarding curriculum and core content were consistent with themes in current simulation fellowship programs. There was suggestion to consider publishing a white paper or guidelines for pediatric simulation curriculum that would position IPSS as an authoritative resource for other institutions who are developing simulation programs or curriculum. Collaborating with other organizations like INSPIRE was also considered imperative. Certificate of completion signed by the IPSS leadership would be of value and add credibility to simulation fellowships at other institutions who meet the milestones and assessment tool of IPSS Simulation fellowship. The funding of the fellowship program, job description and support for fellowship director need more clarity.

Disclosure of Interest: M. Madhok Research/Education Support from: Co-chair, research committee, Honoraria Support from: None, Stocks of: None, Advisory Board of: None, Consulting of: None, F. Haji: None Declared

OP 05-6 – Integrating Simulation Into A Nursing Induction Programme
Programme development/ Administration and Program Management
Submission ID: IPSSW2017-1146

Kirsty Brown* 1
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Abstract Body: This presentation is going to look at the induction programme new nursing starters to Bristol Royal Hospital For Children receive, specifically the simulation component of the course.

Background: In 2011, a programme for new nursing starters was established at Bristol Royal Children’s Hospital, UK, this was in addition to the mandatory training they received in Trust Induction and focussed on more clinical and practical skills. The aims of the course were to help ensure that all new starters were practising at an acceptable standard as well as offering an induction to working at BRCH. Worldwide, nursing induction programmes aim to create a good foundation for new starters by helping to provide support and education at a very stressful time (1). Retention of staff is currently as important as recruitment, as a high turn-over of staff has massive financial implications. By making staff feel valued and supported, they are less likely to leave their employment (2) Effective induction programmes are vital in achieving this (3).

Simulation: In 2015, a simulation component was introduced to further enhance the education provided on the programme. Currently, this involves the candidates attending the Bristol Medical Simulation Centre for a day, where they take part in three high fidelity simulations and two clinical workstations. The day continues to evolve to meet the needs of the learners. In 2016, a human factors session was introduced, and the candidates are encouraged to put this theory into practice in the scenarios.

Data/Feedback: The feedback we receive from the day is generally really positive and the candidates find it very relevant and helpful. We are also looking to get more feedback from the ward managers and educators to ensure that the training provided remains beneficial. Since the simulation day was started, approximately 130 nurses, from newly qualified to departmental leads, have attended.

On-going Work: There is an ever increasing emphasis on multi-professional team training, to try and improve the way we work and communicate in the clinical setting (4). For two scenarios, we already have a Dr involved as a confederate and we are currently looking to make the day more multi-professional by including physiotherapists.
While this day incorporates vital nursing skills, it offers little orientation for the candidates to working in their new environments; we are therefore in the process of starting a programme where all new starters participate in a point-of-care simulation in their own workplace, while they are still in their supernumerary period. This aims to help with orientation to their new work environment as well as acting as an introduction to point-of-care simulation.

References:

OP 06-1 – Effects Of Transcranial Direct-Current Stimulation On Laparoscopic Surgical Skill Acquisition
Simulation for procedural and psychomotor skills
Submission ID: IPSSW2017-1039

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Background: Changes in surgical training environments have limited opportunities for trainees to gain proficiency in surgical skill, restricting medical education efforts. Defining methods to enhance complex procedural skill acquisition could transform future medical training curriculum. Transcranial direct-current stimulation (tDCS) is a non-invasive form of brain stimulation that has been shown to enhance motor skill learning in healthy patients and those suffering from disease. The use of tDCS to enhance procedural skills acquisition has never been explored.

Research Question: To determine the effects of tDCS on simulation-based laparoscopic skill acquisition.

Methods: LETS LEARN (Learning Enhancement using Transcranial Stimulation, Leading Expertise, Acquisition and Retention of Necessary medical skills), a double-blinded, randomized, sham-controlled trial. All experiments took place at the University of Calgary (2016). Participants were healthy medical students with an interest in surgical specialties, enrolled at the University of Calgary. Participants were recruited through email distribution lists. Participants were randomly assigned to receive 20 minutes of anodal tDCS, targeting the dominant primary motor cortex, or sham tDCS, concurrent with Fundamentals of Laparoscopic Surgery skill training using a laparoscopy box trainer. Primary outcomes were Fundamentals of Laparoscopic Surgery peg transfer and pattern cutting task scores following training. Secondary outcomes included safety (Purdue Pegboard Test) and tolerability (Visual Analogue Scale).

Results: Participants receiving anodal tDCS achieved significantly higher pattern cutting scores following training compared to those receiving sham tDCS (201.7±18.1 vs 181.9±35.1; p=0.039). Following training participants receiving anodal tDCS showed a non-significant trend towards higher peg transfer scores following training compared to those receiving sham tDCS (201.7±18.1 vs 210.2±23.5; p=0.144). A greater proportion of participants receiving anodal tDCS achieved various levels of proficiency compared to sham controls in both peg transfer and pattern cutting tasks. No decreases in Purdue Pegboard Test scores were seen for either hand between baseline and post-training in either intervention group. No adverse effects were reported. Sensation reporting was more common with anodal tDCS than sham tDCS. Sensation severity of burning was significantly higher with anodal tDCS than sham tDCS, however remained tolerable (Visual Analogue Scale score=1.06/10).
Discussion and Conclusion: The combination of tDCS with laparoscopic surgical training may yield trainees with greater technical skills. The novel application of transcranial stimulation in procedural skill training represents an important contribution to the future of medical education.

OP 06-2 – Development Of Tracheal Intubation Laryngoscopy Coaching Language Through Remote Simulation Simulation for procedural and psychomotor skills
Submission ID: IPSSW2017-1142

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Background: Tracheal intubation (TI) via direct laryngoscopy is a difficult skill to learn for pediatric trainees. TI is associated with risks to patients and these risks are higher when TI is performed by trainees. The C-MAC video laryngoscope (Karl-Storz, Germany) allows faculty to coach trainees to perform direct laryngoscopy using the indirect video view of the airway. Currently, there is no standardized laryngoscopy coaching language for use during this process. The use of agreed upon standardized language is essential during training to ensure clarity of instruction, avoid confusion and help ensure patient safety. We hypothesized that remote simulation and expert consensus could be used to develop standardized coaching language.

Research Question: Does a remote simulation with a standardized actor as a trainee facilitate development of standardized coaching language for use during tracheal intubation?

Methodology: At the 2016 INSPIRE meeting, simulation experts in pediatrics/pediatric subspecialties were presented with 10 isolated laryngoscopy steps of the TI procedure via remote simulation between Philadelphia, USA and Glasgow UK with B-line system (B-Line Corp, USA) and Google hangout (Google, USA). A scripted simulated trainee performed TI on an infant airway trainer (Trucorp, Ireland). Two video views (profile and video laryngoscope view) with audio were provided to experts. At each step, experts were asked to identify coaching terms they would use, followed by group discussion. The list of terms from the expert consensus was further reviewed and revised by content experts in clinical skills training and resuscitation critical language.

Result: Forty simulation experts (Pediatric Emergency Medicine: 17, Pediatric Critical Care: 8, Neonatology:5, other:8, unidentified:2) participated. The experts performed tracheal intubation a median of 3 times (IQR:0-10) and supervised trainees a median of 6 times (IQR:0-20) in the last 12 months. The preliminary consensus-based standardized coaching language contained three types of phrases: questions, diagnosis/reasoning, and commands. Upon further review by content experts, all diagnosis/reasoning and question phrases were removed except for one: “Do you see the cords?”, resulting in a final standardized laryngoscopy coaching language with a specific, succinct coaching phrase for each step.

Discussion/Conclusions: The remote simulation coaching exercise was effective in achieving expert consensus regarding standardized laryngoscopy coaching language. The final version contained only commands, except one diagnostic phrase.

References:
Disclosure of Interest: A. Nishisaki Research/Education Support from: AHRQ 1R18HS024511-01, A. Ades: None Declared, T. Sawyer: None Declared, N. Yamada: None Declared, C. Walsh: None Declared, E. Laverriere: None Declared, N. Buchanan: None Declared, V. Nadkarni: None Declared

OP 06-3 – Feasibility Assessment Of Animal Models For Simulation In Paediatric Laryngotracheal Reconstruction

Simulation for procedural and psychomotor skills
Submission ID: IPSSW2017-1209

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Background: Laryngotracheal Reconstruction (LTR) remains the work horse of Paediatric Airway Surgery. Decreasing numbers of children and infants requiring this procedure due to improved endoscopic treatment outcomes has led to decreased training opportunities and has the potential to be associated with deskillling of Paediatric Airway Surgeons. Simulation using animal models has been demonstrated to provide an effective platform for trainees and consultants to increase experience and acquire skills in other otolaryngological procedures. A validated simulation model has the potential to improve pre-operative surgical planning, performance and overall outcomes.

A variety of animal models have been used to simulate the paediatric larynx for research purposes. No studies have yet compared the feasibility of commercially available animal models for use in simulating paediatric LTR for training purposes.

Research Question: How feasible is the laryngeal anatomy in commercially available animal models for high fidelity simulation of LTR?

Methodology: Three different animal models (lamb/suckling pig/rabbit) were used and compared in this study. Their suitability for use in simulating laryngotracheal reconstruction was qualitatively assessed. Animal products were obtained from abattoirs through a medical supplies company. The animal’s trachea and larynges were systematically assessed. Anatomical dimensions, similarities and differences between models, and overall resemblance and size correlation with paediatric equivalent were evaluated. Standardised operative approach was used for performing LTR on each model and the results were compared. Autologous animal tissue was utilised as anterior/posterior graft material each model.

Results: As all models were fresh-frozen, tissue planes, texture and handling were all similar between models, and a realistic representation of performing LTR in the paediatric patient. It was possible to obtain autologous cartilage graft in all specimens, with the graft material demonstrating equivalent plasticity, contouring and texture to the paediatric patient. Despite variations in laryngeal cartilaginous arrangement all specimens resembled the paediatric larynx, and were suitable for performing all steps of the LTR procedure. Laryngeal dimension varied widely and allowed for direct age comparison. The rabbit most closely resembled the neonatal and younger paediatric age group (0- 24 months). The porcine and ovine models represented an older age group (8-10 above).

Discussion/Conclusions: All animal tissue used in this study provide a highly realistic model of the in-vivo experience of a paediatric LTR. Their commercial availability, tissue feel and laryngeal anatomy makes them ideal material for use for simulation of LTR. More in depth studies are required to formally assess and validate use of such models as simulation tools for training and pre-operative surgical planning.

OP 06-4 – Cardiopulmonary Resuscitation During Simulated Pediatric Interhospital Ambulance Transport  
*Simulation for procedural and psychomotor skills*

Submission ID: IPSSW2017-1183

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1ACCM, 2Nursing, 3Johns Hopkins Hospital, Baltimore, United States

**Background:** Transporting children in cardiac arrest with ongoing cardiopulmonary resuscitation (CPR) between hospitals is a potentially life-saving endeavor if it enables patients with out-of-hospital arrest or witnessed arrest at a community hospital to access tertiary care resources such as extracorporeal support. However, these transports may risk personnel safety given the limited options for safe delivery of manual CPR and lack of approved pediatric mechanical compressor devices. Furthermore, we are unaware of any literature on the feasibility of high-quality CPR during pediatric interhospital transport.

**Research Question:** We aim to investigate whether high-quality manual CPR can be performed on children during the mobile, lengthy interhospital ambulance transport.

**Proposed Approach Addressing the Question:** The Johns Hopkins Pediatric Transport team performed a series of simulations of manual CPR in a moving ambulance in inner-city traffic using the Laerdal SimBaby, Gaumard 5-year-old HAL and Laerdal SimMan 3G manikins. Team composition mimicked the one typically used for complex interhospital transports. We simulated two clinical scenarios: the interhospital transport of an infant with presumed volvulus who unexpectedly developed cardiac arrest once loaded in the ambulance; and the interhospital transport of a child/adolescent already in cardiac arrest from presumed myocarditis. Each scenario involved four transition points: referring facility’s emergency department → transport stretcher; loading into the ambulance; off-loading from the ambulance; transport stretcher → receiving facility’s pediatric intensive care unit. CPR data was collected via Zoll R Series. CPR quality was evaluated using the age-appropriate AHA 2015 Guidelines.

**Conundrum:** Challenges included difficulties standardizing the provider groups, duration of transport, ambulance speed and CPR technique to maximize provider safety. Accurate CPR data was collected from eight simulations: two with Laerdal SimBaby, one with Gaumard 5-year-old HAL and five with Laerdal SimMan 3G (Table). Median number of providers was 5.5 (range: 4-6), duration of CPR data was 15 minutes 47 seconds (range: 11-23 minutes) and compression fraction was 97.6% (range: 78.8-99%). Median compression rate was 111.5 cpm and depth was 5.2 cm. Of all compressions performed, 40% were guideline-compliant for depth (range: 3-75%) and 57% for rate (range: 14-87%). Six simulations had no CPR interruptions ≥ 10 seconds.

**Questions for discussion:** Despite our encouraging results, the feasibility of performing safe high-quality manual CPR in pediatric interhospital transport remains to be established, particularly for the younger age groups. Additionally, studies have yet to evaluate the impact of provider experience, training, and teamwork and communication skills, as well as fatigue, on CPR quality during prolonged interhospital transports.

**Image:**
**TABLE** Characteristics of Simulated Initial Cardiopulmonary Resuscitation during Pediatric Interhospital Ambulance Transport

<table>
<thead>
<tr>
<th>Transport Personnel</th>
<th>Simulation Scenario</th>
<th>Manikin</th>
<th>Duration*</th>
<th>CPR Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediatric Critical</td>
<td>Care Fellow 1-year-old with presumed volvulus who developed PEA arrest in the ambulance</td>
<td>Laerdal SimBaby</td>
<td>12m 45s</td>
<td>Compression fraction: 94.5%</td>
</tr>
<tr>
<td>Care Fellow</td>
<td>Mean rate: 100 bpm Mean depth: 2.5 cm Correct CPR rate: 14.0% Correct CPR depth: 3.1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMT</td>
<td>Interruptions: ≤10% none</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Critical</td>
<td>Care Fellow 1-year-old with presumed volvulus who developed PEA arrest in the ambulance</td>
<td>Laerdal SimBaby</td>
<td>15m 40s</td>
<td>Compression fraction: 78.8%</td>
</tr>
<tr>
<td>Care Fellow 5-year-old with witnessed VfB arrest at OSH</td>
<td>Mean rate: 76 bpm Mean depth: 2.3 cm Correct CPR rate: 32.0% Correct CPR depth: 3.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMT</td>
<td>Interruptions: ≤10% none</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Critical</td>
<td>Care Fellow 16-year-old with presumed myocarditis and witnessed VfB arrest at nearby OSH</td>
<td>Laerdal SimMan 3G</td>
<td>14m 12s</td>
<td>Compression fraction: 93.3%</td>
</tr>
<tr>
<td>Care Fellow</td>
<td>Mean rate: 113 bpm Mean depth: 5.3 cm Correct CPR rate: 84.0% Correct CPR depth: 5.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMT</td>
<td>Interruptions: ≤10% none</td>
<td>Pre-shock pause: 2.2s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Critical</td>
<td>Care Fellow 16-year-old with presumed myocarditis and witnessed VfB arrest at nearby OSH</td>
<td>Laerdal SimMan 3G</td>
<td>11m 25s</td>
<td>Compression fraction: 97.2%</td>
</tr>
<tr>
<td>Care Fellow</td>
<td>Mean rate: 119 bpm Mean depth: 5.6 cm Correct CPR rate: 55.0% Correct CPR depth: 6.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMT</td>
<td>Interruptions: ≤10% none</td>
<td>Pre-shock pause: 1.4s; 0.2s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Critical</td>
<td>Care Fellow 16-year-old with presumed myocarditis and witnessed VfB arrest at nearby OSH</td>
<td>Laerdal SimMan 3G</td>
<td>16m 27s</td>
<td>Compression fraction: 98.3%</td>
</tr>
<tr>
<td>Care Fellow</td>
<td>Mean rate: 115 bpm Mean depth: 5.6 cm Correct CPR rate: 75.0% Correct CPR depth: 6.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMT</td>
<td>Interruptions: ≤10% none</td>
<td>Pre-shock pause: 24s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Critical</td>
<td>Care Fellow 16-year-old with presumed myocarditis and witnessed VfB arrest at nearby OSH</td>
<td>Laerdal SimMan 3G</td>
<td>19m 46s</td>
<td>Compression fraction: 98.0%</td>
</tr>
<tr>
<td>Care Fellow</td>
<td>Mean rate: 110 bpm Mean depth: 5.1 cm Correct CPR rate: 87.0% Correct CPR depth: 6.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMT</td>
<td>Interruptions: ≤10% none</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pediatric Critical</td>
<td>Care Fellow 16-year-old with presumed myocarditis and witnessed VfB arrest at nearby OSH</td>
<td>Laerdal SimMan 3G</td>
<td>15m 45s</td>
<td>Compression fraction: 95.0%</td>
</tr>
<tr>
<td>Care Fellow</td>
<td>Mean rate: 123 bpm Mean depth: 5.3 cm Correct CPR rate: 54.0% Correct CPR depth: 5.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMT</td>
<td>Interruptions: ≤10% none</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

CCs = Chest compressions, CPR = cardiopulmonary resuscitation, EMT = emergency medical technician, m = minutes, OSH = out-of-hospital, PEA = pulseless electrical activity, RN = registered nurse, RT = respiratory therapist, s = seconds, VfB = ventricular fibrillation.

*Duration of CPR data captured by device.

**OP 06-5 – A Systematic Review Of Simulated Laryngotracheal Reconstruction Animal Models**

*Simulation for procedural and psychomotor skills*

Submission ID: IPSSW2017-1218

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**Background:** Laryngotracheal reconstruction (LTR) is a technically challenging procedure and is only performed in specialist tertiary paediatric centres. Consequently, otolaryngology trainees gain minimal exposure to the procedure, and would derive great benefit from a LTR simulation model. As with simulated endoscopic laryngeal surgery, animal models can be utilised to simulate open paediatric laryngeal surgery. The aim of this literature review is to identify which animal models have been utilised, and to determine which is the most practical, high fidelity animal model to simulate advanced paediatric airway surgery.
Research Question: Which animal models have been utilised, and which demonstrate the greatest utility in simulating paediatric LTR, as demonstrated following systematic review of the literature?

Methodology: A systematic review of Pubmed and EMBASE databases was conducted independently by two authors, according to PRISMA guidelines, between 10/11/16 and 25/11/16. Search terms included 'laryngotracheal reconstruction' & 'laryngotracheoplasty'. Following article review, any study incorporating animal models was identified. In addition, the following search terms 'pig & larynx', 'sheep & larynx', and 'rabbit & larynx' were also reviewed to ensure adequate article capture. All non-English language articles, studies reviewing adult LTR (e.g. utilising pedicled flaps), and studies using non-commercially available animal models were excluded. Articles were then assessed for feasibility as a training tool, model validation and verisimilitude to paediatric LTR.

Results: In total 104 articles were identified relating to LTR in animal models. Following application of exclusion criteria 62 articles were reviewed, incorporating both in vitro and in vivo studies. The rabbit model was studied most (n=52), as the rabbit laryngeal dimensions most closely resemble the paediatric population undergoing LTR. Other commercially available animal models utilised include the pig (n=7), sheep (n=1) and goat models (n=2). Primarily articles were attempting to address research questions (e.g. alternative graft materials). Only 2 studies (pig and sheep models) assessed animal models as a training tool, with both models displaying adequate verisimilitude to simulate paediatric LTR. None of the animal models identified in the literature has been validated as a simulation tool.

Discussion: Simulated LTR using animal models has been primarily utilised to address research questions, and literature review suggested significant heterogeneity in model selection and reporting of outcomes. The rabbit, sheep and pig models have demonstrated the greatest potential for use as advanced paediatric airway surgery simulation models, with the rabbit model being most utilised in the literature. However, as yet there have been no studies formally assessing simulated LTR animal model feasibility, and models have not been validated as a simulation training tool.


OP 06-6 – Attenuation Of Emergency Department Mattress Compressibility Using Various Hard Surfaces

Patient safety and quality improvement

Submission ID: IPSSW2017-1040

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Background: Cardiopulmonary resuscitation (CPR) performed on a mattress decreases chest compression depth. Using a backboard partially attenuates mattress compressibility. It is unknown what the effect of: a CPR backboard, a slider transfer board, a CPR backboard with a slider transfer board, and a flat spine board is on chest compression depth when an emergency department mattress is in use.

Research Question: We aimed to determine the effect of a CPR backboard, a slider transfer board, a CPR backboard with a slider transfer board, and a flat spine board on chest compression depth with a mannequin placed on an emergency department mattress.

Methods: The study utilizes a prospective, cross-sectional study design. CPR-certified healthcare providers were recruited to perform two minutes of chest compressions on a mannequin in five conditions, an emergency department mattress with: (a) no hard surface; (b) a CPR backboard; (c) a slider transfer board; (d) a CPR backboard and slider transfer board; and (e) a flat spine board. Compression depths were measured from 2 sources for each condition: an internal device measuring sternum-to-spine compression; and (b) an external device measuring sternum-to-spine compression plus mattress compression. The difference of 2 measures (i.e. depleted compression depth) was summarized and compared between conditions.
Results: 10203 individual compressions from 10 participants were analyzed. The mean depleted compression depths (percentage depletion) secondary to mattress effect were: 23.6mm (29.7%) on mattress only, 13.7mm (19.5%) on backboard, 16.9mm (23.1%) on slider transfer board, 11.9mm (17.3%) on slider transfer board plus backboard, and 10.3mm (15.4%) on flat spine board. The differences were statistically significant (p < 0.001).

Discussion / Conclusion: CPR providers should use a CPR board and slider transfer board or a flat spine board alone as these conditions are associated with the smallest amount of mattress compressibility.

OP 07-1 – Assessment And Management Of Life Threatening Emergencies At Schools
Simulation instruction design and curriculum development
Submission ID: IPSSW2017-1070

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Introduction: Medical emergencies can happen in any school at any time. From an injury to anaphylaxis, to status epilepticus, schools are expected to anticipate and prepare to respond to a wide variety of emergencies1, 2. Premature deaths in schools from sudden cardiac arrest, blunt trauma, asthma, allergic reactions, and heatstroke have been reported. This course is the first of its kind in the region using simulation to assess and manage selected life threatening conditions occurring at schools.

Methodology: Although in the past 20 years simulation has become more integrated into the education of nurses and physicians, it has not been as well integrated into the development of skills for practicing nurses 3 .This course was developed with the objective to enable school healthcare professionals demonstrate skills in handling life threatening emergencies in school children. The course was conducted twice with a total of 11 school and nursery nurses participating .Pre course reading material was sent to the participants on the topics of emergency treatment of anaphylactic reactions, pain management in children and preventing and responding to violence in early childhood .High fidelity simulators and standardized patients were used to simulate scenarios on the above mentioned conditions as well as on heat stroke. Checklists were provided to the participants observing the scenario which later contributed to the debriefing session. A specialist was invited to speak on child abuse and neglect.

Outcome: The feedback from the participants which was captured in a pre-course and post course questionnaire was very encouraging. It described the benefits of “simulating a scenario”. The session on child neglect and management of an anaphylactic reaction was the highlight of the course during the session. Many participants verbalized their challenges their scope of work citing examples like the unavailability of an Epinephrine auto injector in pharmacies and not knowing how or where to report a child neglect case .

Conclusion: 6 repeat courses are planned for the upcoming year due to the overwhelming response from school and nursery nurses. There is scope for further research in the area of assessing the competency of school nurses in handling life threatening emergencies at school.

References:

OP 07-2 – Remediation Of The Underperforming Trainee/ Provider: A Multidisciplinary, Simulation-Based Workshop
Simulation instruction design and curriculum development
Submission ID: IPSSW2017-1033

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Abstract Body: Staff/trainees who fail to meet standards for decision-making, procedural skills, professionalism, and teamwork/communication present challenges to supervising providers. Our workshop offers a collaborative environment to develop simulations to remediate the healthcare provider.

Objectives: After this workshop, attendees will be able to:
- Develop simulations designed to remediate staff/trainees in the areas of decision-making, leadership, communication and procedural skills.
- Develop simulations designed to prepare supervisors and mentors to remediate staff/trainees in the areas of professionalism and communication.
- Utilize methodologies to minimize the perception(s) of simulation-based remediation as being punitive or personal.

Intended Audience: This workshop would be beneficial for simulation faculty, educators, and training program leadership (MD, RN, AHP). It is appropriate for intermediate or advanced attendees.

Relevance: Competence in professionalism, decision-making, leadership, communication and procedural skills is essential for delivering safe and effective healthcare. Ensuring minimal acceptable standards requires three components: specific expectations, valid assessments and methodologies for remediation. These general components are applicable to all areas in healthcare, and, at all training levels.

We will first address assessment, and how to determine when a trainee or staff member is failing to meet minimum expectations, including considerations of validity of assessment tools, formative and summative evaluations, and the role of simulation in assessing performance. When providers fail to meet expectations, simulation is often utilized to assist in developing cognitive, technical and non-technical skills. Attendees will explore the application of simulation as an instructional method to address gaps in each of these areas, as well how to assess subsequent performance.

Workshop design will incorporate key concepts in adult learning, including opportunities for interactivity (ARS, small & large group discussion) and a variety of instructional methods (interactive didactic sessions, video-clips, and facilitated discussions).

Timeline:
- Introductions (10 min)
- Interactive Didactic Presentation (25 min)
- Small Group Activity (35 min)
- Designing simulation-based remediation: Small groups will review 5 short video clips of a provider with a need for remediation. They will design a simulation-based session to address one of the areas of concern, as well as plans for assessment.
- Large group report back (15 min)
- Wrap Up (5 min)

References:


OP 07-3 – Developing And Delivering Patient And Family Centered Care Using Simulation
*Simulation instruction design and curriculum development*
Submission ID: IPSSW2017-1092

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Proposed Format: Patients/families are discharged home with an expectation that discharge education provides necessary skills and knowledge to effectively manage medical needs outside acute care settings. This is especially true of high-risk medical conditions. The concept of using simulation to support patient education is novel and relevant for many patient conditions. This workshop will provide opportunities for participants to develop and deliver a simulation-based curriculum to meet needs of patients discharged from acute care settings. Course faculty will discuss special considerations when developing simulation for non-healthcare providers.

Learning Objectives:
- Participants will identify key concepts that must be considered when developing simulations for patients and caregivers.
- Participants will design a scenario for patient education to meet specific caregiver needs based on scripted cases (seizures, diabetes, anaphylaxis, tracheostomies, CPR)
- Participants will identify specific education gaps that simulation could address in their patient care populations

Relevance to this conference: Simulation for patient-and family-centered care provides opportunities for patients/families to integrate cognitive knowledge and technical skills needed to effectively manage acute medical conditions outside tertiary care centers. This also provides a venue for discovering family and patient strengths and opportunities. The purpose of this course is to provide an immersive experience for participants interested in designing and delivering simulation-based patient/family centered education.

Workshop Timeline:
Welcome/Background (10 minutes)
- Faculty/acknowledgements
- Session Objectives
- Review of special considerations/tools for implementing patient/family centered care

Scenario design: Small group learning activity (20 minutes)
- Interview faculty member to expose needs
- Develop script for scenario design & debriefing

Large group discussion (20 minutes): Faculty facilitate larger discussion focused on small grp sim curricula

Simulation Scenario Implementation: One small group (chosen at random) implements simulation scenario with help of faculty member role playing as a patient/caregiver target learner (20 minutes)
- Interview faculty member role playing patient/caregiver to expose education needs
- Implement sim scenario using role-play
- Implement facilitated debriefing

Large group discussion (20 min)
- Feedback
- Faculty success/challenges
- Summary

References:


OP 07-4 – Easy Hand-Made High-Fidelity Pediatrics Task Trainers Innovation

Innovation/ Future Direction and Outreach Simulation

Submission ID: IPSSW2017-1022

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Abstract Body: A collaborative work among three simulation specialists built a mobile pediatric simulation team called MPS this year, 2016. Due to the nature of the MPS which is "mobile", we used to move overseas to do our pediatric simulation workshops. We have our own equipment including many manikins of medium fidelity. We also have our SPs and few task trainers. The problem with the task trainers are mainly the shipping or travel difficulty with many strange equipment in the flights. The author invents three commonly required task trainers in pediatric practice from very basic materials but with high fidelity. Learners are enjoyed using them during the MPS's workshops. These hand-made task trainers are: Lumbar puncture, chest tube insertion and umbilical catheterization for the newborn. The first lumbar puncture task trainer a small part I insert on a flexible doll with false passage (blood or dry tap) and true passage (CSF fluid clear and turbid). The second one is the chest tube for pneumothorax, hemothorax, empyema and chylothorax. The third is umbilical catheter (UAC& UVC) is a small part connected to a newborn manikin with blood coming only on appropriate technique. Currently, I'm working in another two hand-made task trainers. I beleive I should share this experie

The learning objectives are: 1. Brain storming the learners to innovate something new. 2. The learners will perform at least one task trainer. 3. Competition with reward for the best idea of a new task trainer in pediatrics developed by the learners.

The program is 30 minutes' demonstration of ideas generation and my task trainers' development. This is followed by 60 minutes' hands-on interaction with the learners.

References:


OP 07-5 – Translating Clinical Talk to Actor Talk Improves Immersion

Simulation Instruction design and curriculum development

Submission ID: IPSSW2017-1254
Proposed Format: This workshop will consist of a few brief slides to set the foundation, learning objectives, and outcomes of the workshop. This will be followed by a sample reenactment of a scenario with an actor, a debriefing, and time for each participant to practice translating a scenario from a clinical talk to actor talk.

Outcome: The outcome of this workshop is to help those involved in simulation scenario building to effectively ‘translate’ scenarios for better actor understanding and execution in an immersive simulation.

Learning Objectives:
- Recognize the disconnect between simulated patients and the clinical expectations of a scenario and address them
- Develop a working knowledge of the needs of the standardized patient in complex scenarios
- Identifying the appropriate skillset and staff member at various organizations to lead this effort

Intended Audience: This workshop is appropriate for all levels of simulation users.

Relevance to the Conference: The use of simulation and simulated patients has been proven to impact practice and quality outcomes. The simulated patient needs to be fluent in the case and adjust their delivery based on the prompts, empathy, and verbiage of the learner immersed in simulation. Spending the time making sure the simulated patient is well versed in the scenario helps to better define their role as the patient, ensures that they understand the scenario and the importance of the appropriateness of their responses and emotions, and also empowers them to feel informed and remain engaged in the scenario. These positive and realistic interactions between providers and patients allow the simulated patients to be a worthy learning tool for providers and allow providers to improve the level of care they provide to their patients and families.

Workshop Timeline:
- Introductions, pre-assessments, and disclosures (10 minutes)
- Slides that include background, learning objectives, and case (15 minutes)
- Hands-on simulated with live actor followed by debrief (25 minutes)
- Practice translating presented scenario into actor talk (30 minutes)
- Final discussion/questions (10 minutes)

OP 07-6 – Impacts Of A Simulation-Based Extracorporeal Cardiopulmonary Resuscitation (Ecpr) Training Program
Patient safety and quality improvement
Submission ID: IPSSW2017-1219

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Background: Extracorporeal cardiopulmonary resuscitation (ECPR) is placing a patient with refractory cardiac arrest on extracorporeal life support during cardiopulmonary resuscitation. ECPR is extremely complex and involves dynamic interactions of a larger interprofessional healthcare team. We started an in situ, simulation-based, ECPR training program to educate our staff and to improve the care of patients receiving ECPR in our pediatric, cardiac and neonatal intensive care units.

Research Question: Does simulation-based ECPR training result in healthcare staff learning and improve the care of patients receiving ECPR?

Methodology: ICU-specific ECPR simulation scenarios were developed for the training. Learning objectives for all scenarios were the same and included: quick identification of ECPR candidates, activation the ECPR system in accordance with hospital policy, providing effective cardiopulmonary resuscitation, and demonstrating good teamwork and communication. Every ECPR simulation involved a large interprofessional team of 10-15
Results: From February 2014 to October 2015, a total of 332 healthcare professionals participated in 29 ECPR simulations in one of the 3 ICUs. Participants enjoyed the simulations and reported learning gains. ACTA revealed two specific behaviors - coordination of compressions with surgical cannulation, and performing sterile compressions - that were targeted for further training. There were 155 cardiac arrests in the 3 ICUs from December 2012 and August 2015: 58 before simulations vs. 97 after. The rate of adherence to the ECPR activation protocol increased from 82.8% before simulation to 94.9% after (p = 0.02). The time from starting CPR to ECPR activation was faster after the training: 7 min vs. 2 min; p < 0.01. The proportion of inappropriate ECPR activations did not change: 6% before vs. 7% after; p = 0.92.

Discussion/Conclusions: A large-scale, in situ, simulation-based, interprofessional ECPR training program was associated with positive reactions, team learning, behavioral change, and improved adherence to the ECPR activation protocols. Other centers that do ECPR should consider interprofessional simulation-based training.

OP 08-1 – A Systems Approach To Effectively Design Pediatric Simulations

Process improvement and organizational change
Submission ID: IPSSW2017-1166
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Course Overview: A systems approach is crucial in implementing effective simulation education in healthcare. This workshop introduces the concepts and application of systems thinking whereby participants will have the opportunity to use the systems approach to design a simulation program in small groups using a pediatric case-based scenario.

Learning Objectives:
- To define systems thinking in healthcare systems
- To describe the 5 “Rules” that guide improvement in complex systems
- To apply the systems approach to implementing effective simulation education

Course Content and Relevance: This 90-minute workshop aims to provide participants with the knowledge and tools in applying the systems approach to designing effective simulation education in a pediatric care setting. Targeted audience is novice and advanced educators, preferably 15 participants.

A system is made up of components that interact and cooperate in processes. Systems thinking is based on the understanding that components of a system are best viewed in the context of relationships rather than in isolation. ¹ The healthcare system should be viewed as a complex adaptive system where components are characteristically intelligent, non-linear and dynamic with goals and behaviours that are likely to conflict.² Understanding the healthcare system as a complex adaptive system is important in designing and implementing effective simulation based education.

Practical tools will be introduced to participants in this workshop. Firstly, participants will become familiar with the 5 “Rules” in systems approach that has been used in the manufacturing system, including “System Rule”, “Pathway Rule”, “Connection Rule”, “Work Activity Rule” and “Improvement Rule”.³ Secondly, participants will be introduced to the use of diagrams such as fish bone diagrams and driver diagrams.⁴ Thirdly, the use of a project charter template for planning clinical simulation activities will be explained.⁵ A pediatric case-based scenario involving management of a deteriorating patient will be discussed in small groups so that participants can apply the system approach. Using the tools introduced in the workshop, participants will learn how to plan and implement a simulation activity in a pediatric setting.

Workshop Timeline:
• 5 mins: Faculty introductions/verbal disclosures
• 10 mins: Participants introductions and needs assessment
• 15 mins: Systems Thinking and Approach to Clinical Simulation (PowerPoint)
• 30 mins: Pediatric Case Based Discussion in small groups
• 20 mins: Presentations and large group discussion
• 10 mins: Learner and Course Evaluations

References:
2. Rouse WB. Health care as a complex adaptive system: Implications for design and management. Available at: http://www.nae.edu/nae/bridgecom.nf/BridgePrintView/MKEZ-7CLKRY?OpenDocument

OP 08-2 – Using Simulation To Drive Pre-Construction Design Of Safe Patient Care Environments: A Workshop System Integration
Submission ID: IPSSW2017-1137

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Overall Goal: Designing and building a new hospital environment creates potential patient safety threats and challenges to providers. Simulation can be utilized at the early stages of design during the pre-construction phase to identify and prevent latent safety threats. The Agency for Hospital Research and Quality (AHRQ) has recommended since 2012, that hospitals engage in simulation early in the design phase to identify and prevent design related threats to safety such as hindered patient visibility, lack of room standardization, noise reduction, provider fatigue, and more (1). The use of simulation-based evaluation of new hospital environment designs presents an exciting opportunity for healthcare simulation to play a role in supporting quality improvement and patient safety efforts in an innovative way. The goal of this workshop will be to share a framework for implementing simulations early on during the design and pre-construction phases of building a new unit, hospital or other patient care setting.

Learning Objectives:
• Describe how high fidelity simulation is used to identify latent safety threats and other design concerns during the pre-construction phase
• Outline the key components in planning and implementing a simulation project to help design a safer new hospital space including the needs assessment, simulation methodologies, and outcome measures.
• Develop a project plan to for your own institution to use simulation as a tool to assist with safe hospital design in the pre-construction phase

Workshop Timeline:
• Introduction to session-15 minutes (Faculty introductions, Review agenda/plan for session)
• Background-15 minutes (Framework for use of simulation to drive pre-construction design of new hospital environments)
• Interactive session- 45 minutes
• Large group discussion and summary – 15 minutes

References:

Disclosure of Interest: J. Arnold Consulting of: Vaccine Awareness Media , K. Stone: None Declared, K. Wallin: None Declared, C. Allan: None Declared

OP 08-3 – Embedding Simulation - Embedding Bugs: Does Embedded Simulation Compromise Patient Safety?
*Patient safety and quality improvement*
Submission ID: IPSSW2017-1037

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Background: Simulation based education in clinical environments (embedded simulation) improves professional development, communication, teamwork and decision making helping produce a well-educated workforce. Like other medical devices, simulation equipment has the potential to harbour pathogens. Currently, we have no standard institution cleaning mechanism (only manufacturer guidelines) or monitoring of the potential hazard posed by colonised simulation equipment. We were concerned that simulation equipment might pose a risk to patients by contributing to healthcare-associated infections.

Aims: To study whether the manufacturer decontamination regime for simulation manikins is adhered to and renders the manikins safe to use in clinical practice. We aimed to survey current cleaning methods; establish if the manikins were contaminated and describe the significance of positive cultures in the clinical setting. If pathogens were identified we aimed to identify potential sources of contamination and propose interventions to render simulation equipment safe to use in the clinical environment.

Methods: Prospective microbiological sampling of simulation equipment occurred before simulation training sessions occurring either in the simulation suite or a clinical area. Samples were processed by the environmental laboratory to identify bacteria, mould or fungus. Simulation training sessions were observed to document infection control procedures and post simulation cleaning methods. An online survey of the simulation faculty was conducted to identify current practice and concerns. Approval for the study was given by the University of Southampton as this was a medical student led project.

Results: Samples grew *Staphylococcus warnei*, *Ochrobactrum intermedium* and *Paracoccus yeei*. The concentrations on the manikins exceed those considered safe for clinical surfaces. There was a lack of use of PPE and attention to hand hygiene during the simulation training sessions. No post session decontamination of manikins was observed. 11 out of 23 questionnaires were completed with 50% of faculty indicating that they had concerns with current practice. We proposed a standardised, effective decontamination care bundle for
simulation equipment which been adopted by the simulation centre and disseminated to faculty involved in embedded simulation.

**Conclusions:** To our knowledge no studies have addressed the potential role of simulation equipment in the transmission of pathogens in the clinical environment. Organisms identified so far are of clinical significance, especially for immune-compromised patients.

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**OP 08-4 – Systematic Reparations Minimize Safety Risks In Serial NICU Care Transitions**

*Patient safety and quality improvement*

Submission ID: IPSSW2017-1265

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**Background:** The Brigham and Women’s Hospital (BWH) high-risk maternal and neonatal referral center, opened the first of a 66-bed, 3 phase, single family room neonatal intensive care unit (NICU) construction project in July 2016.

**Objectives:** The objectives of this study were, prior to moving into a new single family room NICU, to evaluate the safety of pre-existing workflows which were historically refined in an open bay model of care, to minimize patient exposure, to familiarize the multidisciplinary staff with the new NICU, and to incorporate safe workflow practices into an orientation program for all staff.

**Methods:** To facilitate a safe transition from an open bay model to a single family room NICU which is four times larger, we prepared using the TESTPILOT- NICU methodology. The BWH Institutional Review Board reviewed and approved this five step protocol: (1) Needs assessment: A multidisciplinary needs assessment was conducted to learn the greatest concerns of NICU staff in anticipation of the move to a single family room model of care. The feedback was categorized into high, medium, and low safety risk. (2) Simulation: To focus on the staff’s greatest safety concerns, the information gathered in the needs assessment’s High Safety Risk category was used to design clinical scenarios. These scenarios were employed in a series of six simulations to test workflows in the new NICU facility prior to the move, to identify safety concerns and explore solutions. A full complement of multidisciplinary staff participated in simulations. (3) Orientation: Using the lessons learned in simulations, orientation workshops were designed to familiarize all staff with the new NICU space prior to the move in date. (4) Move in: The move in was monitored for new safety concerns as each patient was transferred to the new NICU. (5) Post Move in: Workflows were modified with safety lessons learned during/after the move-in. A predefined 1 month moratorium on any workflow modification that was not indicated by a critical safety threat was observed to establish stability in the new workflows.

**Results:** A total of 102 discrete safety threats were identified through the above process, which were categorized into Workflow (34), Staff Assignments (11), Bedside Support During Clinical Emergencies (8), and Technologies (49). These safety threats were modified with multidisciplinary staff input to achieve safe and appropriate processes for the single family room model of care.

**Conclusions:** NICU staff identified and resolved safety threats without patient exposure. These findings support the literature on simulation as a means to mitigate risk in the transition between models of care. This study will continue throughout preparation for and transition into the subsequent 2 phases of this single family room NICU construction project (March & November '17). (Results from the transition into phase 2 will be included in any presentation of this work at IPSSW2017).
OP 08-5 – Incorporation Of Simulation Training Into Induction Improves Confidence In Medical And Nursing Staff

Patient safety and quality improvement
Submission ID: IPSSW2017-1126

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Context: In ‘Leadership and management for all doctors’ the General Medical Council (GMC) of the United Kingdom highlight the importance of induction in ensuring the delivery of safe, effective and efficient care to patients.1 The Royal College of Nursing (RCN) also state that local induction is essential to enable new members of staff to become familiar with their environment and establish relationships necessary to allow
them to settle into their new role. In an attempt to improve the quality of induction offered to all new staff in the Royal Belfast Hospital for Sick Children (RBHSC) multidisciplinary, high-fidelity simulation training has now become an integral part of the induction programme for both medical and nursing staff.

**Description:** All new staff must attend mandatory, inter-professional, simulation training sessions. The chosen clinical scenarios focus on common emergencies that medical and nursing staff may encounter in their area of work. After the scenarios participants are encouraged to reflect upon the learning experience. A formal debrief considers aspects of care including:

- The structured approach to a critically ill child
- Treatment options and situational awareness
- Clinical skills
- Drug and fluid prescribing
- Human factors including communication skills and teamwork

**Observation/Evaluation:** In an attempt to evaluate these sessions we asked participants to complete a questionnaire prior to undertaking the session which included questions on previous experience and confidence in managing certain clinical situations. Participants were then asked to complete a further questionnaire after the session providing feedback on the teaching and reassessing their perceived confidence for the same clinical scenarios.

New medical staff reported an increased confidence in managing all five clinical presentations to which they were exposed. [Figure 1] All of the medical staff agreed that the sessions had increased their clinical knowledge and skills. Free text comments included:

‘Helps to build confidence in a safe environment’

‘Enabled me to gain confidence in managing common paediatric emergencies and to work closely with nursing staff who I will be working with on the wards’

Nursing staff also reported that they felt more confident in managing common emergencies on a ward (2.8/5 > 4.6/5). All staff strongly agreed that simulation should be included in induction. Free text comments included:

‘The most useful session of our induction week’

‘Great learning experience’

‘10/10!’

**Discussion:** Simulation embraces the use of technology enhanced learning to improve the quality of induction we can offer our staff. Our experience of embedding simulation within our induction programme has been very positive. It helps us to develop confidence, clinical skills and non-technical skills in our new staff. We would strongly recommend this strategy to others who are developing or reviewing their induction programme.

**OP 08-6 – Cycles Of In Situ Simulation Required For Safely Opening A Greenfield Outpatient Center**  
*Patient safety and quality improvement*  
Submission ID: IPSSW2017-1171

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**Background:** Successful opening of an outpatient clinic in a Greenfield site requires a comprehensive education strategy to minimize latent patient safety threats. There is a paucity of research to guide the use of Interprofessional simulation in this setting. [1, 2] We describe an iterative process for planning and refining workflows that created a platform for both education and environmental and process testing (EPT). These workflows were then used to develop curriculum for different staff member roles. Curriculum was delivered using an Interprofessional blended learning education model that emphasized in situ simulation. In-situ simulation with EPT was used to consolidate the Interprofessional team’s ability to provide the appropriate care in the facility. A final validation phase using five cycles of top cases with no patient safety issues was used as the benchmark for determining clinic readiness.

**Research Question:** Is workflow design using 20 cycles of deliberate practice for learning and 5 cycles for validation using an Interprofessional blended learning model with in situ simulation sufficient for opening a Greenfield Outpatient Center safely?

**Method:** We used an iterative development of curriculum based on the workflows related to top cases for 3 distinct clinics; the first clinics to open in a Greenfield woman and children’s outpatient center. The workflow development was led by the clinic leads, and a preliminary environmental scan was done in situ to ensure unit readiness, and validate the workflow. A curriculum to support the 15 different workflows in the opening three clinics was delivered over one week. Each workflow was consolidated with 20 cycles of deliberate practice during
the second week. Five sequential cycles, evaluated by an external monitoring team to be free of any latent patient safety threats were required prior to clinic opening. We tracked patient volumes, EPT issues and resolution times & patient/family perceptions of experience using a validated patient satisfaction survey.

Results: Seventy five staff for the three opening clinics completed the training. Patient volumes increased from five patients a day/clinic to 7-10 patients/day/clinic over the first month. There were no harm events or reports of patient safety threats. Ninety eight percent of patients/families of 511 patients seen in the first month were surveyed; 98% of these reported care from the team as very good to excellent. Over three hundred issues were identified in EPT; 300 were resolved prior to clinic opening with remaining issued deemed not critical to patient safety.

Conclusion: Patient workflows provide a platform for workflow validation, curriculum design, and EPT in a Greenfield outpatient center. Five cycles of in situ simulation of top cases free of latent patient safety threats is a good measure of readiness to open safely. Family feedback can be an effective metric of team performance.

References:

OP 09-1 – Better Leadership, Better Teamwork!
Crisis Resource Management/Human factors and Teamwork
Submission ID: IPSSW2017-1163

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Background: During life-threatening events, safety of patients depends on team’s performance. High-fidelity simulation (HSF) improves leadership and teamwork. However, to our knowledge, relation between leader performance and team performance has not been studied.

Objectives: 1) To study leader and team performances during high-fidelity simulation (HFS); 2) To correlate performance scores.

Methods: IRB approval from the University Hospital of Poitiers, France, and INSERM-CIC 1402 (Research Institute). Single-center RCT whose methodology was published elsewhere (ClinicalTrials.gov registration number NCT02424890) [1].

48 participants were randomized in 12 MDTs of 4 members: an emergency physician (EP), a resident (GPY), a nurse and an ambulance driver (composition of French EMS) for a HFS session (infant in hypovolemic shock – SimNewB, Laerdal*). Technical performance was assessed by the intra-osseous (IO) access performance scale and the Team Average Performance Assessment Scale (TAPAS); non-technical performance by the Behavioral Assessment Tool (BAT) for leaders and the Clinical Teamwork Scale (CTS). Correlation between performance scores used the Pearson correlation coefficient. A p value < 0.05 was considered significant.

Results: Scores (over 100) were: IO=65.6±14.4; TAPAS=44.6±18.4; BAT=49.5±22.0; CTS=50.3±18.5. There was a strong correlation between leader performance and team performance: BAT and CTS (r=0.962, p<0.001), and BAT and TAPAS (r=0.815, p<0.001). The CTS and TAPAS scores were over 50/100 when the BAT scores were over 60/100. A weak correlation was found between IO access and CTS (r=0.287, p=0.04). There was no correlation between IO access and BAT scores (p=0.14), and between IO access and TAPAS scores (p=0.10).

Discussion/Conclusion: Team’s technical and non-technical performance were correlated to leader’s performance. A single task like IO access was less influenced by leader performance. These results suggested that leadership training courses could improve team performance and therefore improve patient’s outcome.
**Context:** The demands faced by combined neonatal and paediatric transport teams include access to guidelines specific to their wide scope of care. Emergency interventions, such as those required in the management of the difficult airway, are particularly challenging. We describe the process for developing an emergency difficult airway algorithm. We reviewed the literature and incorporated methods for mitigating human factors during task saturated events. During the process, we have developed a checklist of the ‘5Cs’ to assist in emergency algorithm design.

**Description:** The transport team previously utilized the UK’s national Difficult Airway Society (DAS) guidelines, which are for theatre based anesthetists caring for children aged 1 to 8 years old. The first step was to test the existing guidelines using simulation and use this experience with information from the literature, to draft new guidance more suited to the patient population. We utilized the new algorithm in simulations of a difficult airway scenario up to and including the performance of a needle cricothyroidotomy. The participants did not have prior knowledge of the new algorithm. Debriefing included an analysis of the participant’s opinions of the algorithm and the influence of human factors on its usability. Following each simulation, improvements were made incrementally until the final version.

**Observation:** 11 simulations were completed with a mixture of paediatricians, anaesthetists, advanced nurse practitioners and transport nurses. Observations included individual performances during the simulation and efficiency of team working as well as comments made during the debriefing. Becoming task saturated led to difficulties understanding the flow of the new document initially. An iterative design process was employed to make adjustments to the algorithm based on observations made. Through progressive simulations with team members the algorithm was modified until it was felt that usability was optimized.

**Discussion:** Using the experience gained developing this algorithm, we identified five key areas which should be focused on to ensure usability of the final document.

**Colour and Contrast:** Using colour is important to highlight key points but the colour scheme is most important. Readability is improved with a white font on a light blue background. Critical points should be printed in black on a yellow background, as this scheme is known to promote a sense of danger to humans. San-serif fonts have been described by NASA to be the most readable and are also used in aviation checklists. Terminology must be fully understood by all members of the team, irrespective of their professional background. The flow of the document must allow users to achieve critical steps even when task saturated. Simulation and debriefing can successfully influence the iterative development of an emergency algorithm using the ‘5Cs’ approach.

**References:**
3. NASA contractor report # 177605 on the typography of flight-deck documentation: Asaf Degani

Disclosure of Interest: None Declared

OP 09-3 – Enhancing Anesthesiology Trainee Performance In Critical Events Using Cognitive Aids
Crisis Resource Management/Human factors and Teamwork
Submission ID: IPSSW2017-1128

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Background: Crises in the operating room (OR) during a pediatric case are fortunately rare with the incidence of cardiac arrest in non-cardiac patients being 2.7/100001. This rarity means that increasingly few anesthesiologists can claim personal experience of the full range of potential OR emergencies. In order to address this, the Society for Pediatric Anesthesia developed cognitive aids (CAs) in the form of Critical Event Checklists (SPA CECs). Several studies have demonstrated the benefit of CAs in improving adherence to guidelines, performing critical tasks and improved Anesthesia Non-Technical Skills2,3. However, despite the presence of CAs, individuals often do not use the aids frequently or use them incorrectly4-6. The way that trainees utilize CAs can potentially be augmented through improved orientation surrounding the tool.

Research Questions:
- Does the mode of orientation (e-module vs. didactic) and the physical presence of CAs increase their uptake in simulated critical operating room events?
- Does the mode of orientation (e-module vs. didactic) and the physical presence of CAs improve the performance of Anesthesiology trainees in simulated critical OR events?

Methods: IRB approval was attained from the local institution. A randomized, 2 x 2 factorial design was used. The first randomization was whether the SPA CEC was available to the participant during the simulations. The second randomization was the mode of orientation (e-module vs. didactic). The simulations were videotaped and rated by two Anesthesiologists using the Managing Emergencies in Pediatric Anesthesia (MEPA) scenario specific checklist and global rating scale (GRS)7.

Results: A total of 78 MEPA simulations were conducted in Anesthesiology Residents. Results demonstrated that CAs were used in 17.9% of simulated scenarios. CAs were used in 44.8% of diagnosis-based scenarios (malignant hyperthermia (MH)/local anesthetic toxicity (LAST)/anaphylaxis) and in 2.0% of problem-based scenarios. In the MEPA simulations, there was a significant difference in the GRS score between participants that used the CA (M=3, SD=1.27) and participants that did not use a CA (M=2.43, SD=0.89) (p=0.048).

Conclusions: The results of this study suggest that the uptake of CAs is poor; however, the type of cognitive aid that is predominantly utilized is a diagnosis-based checklist (i.e. MH/LAST). When CAs are utilized, they enhance performance of trainees in a simulated environment on the GRS by an average of 0.57. This is equivalent to that of an extra 20 months of anesthesia training based on a prior MEPA study8.

References:


Disclosure of Interest: None Declared

OP 09-4 – Quality Of Care In Simulated Infant Codes: A Randomized Trial Of Interprofessional Vs Resident Teams

Interprofessional Education (IPE)

Submission ID: IPSSW2017-1266

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Background: Simulation provides a rich learning environment for interprofessional (IP) teams looking to improve their collaboration and clinical care (1, 2). The interplay between team composition and resuscitation performance is unknown. Research Question: The goal of this study is to determine the differences in simulated resuscitation care provided by teams of different compositions. We hypothesize that IP teams will perform the resuscitation steps of the Pediatric Advanced Life Support (PALS) bradycardia algorithm in a more timely manner than resident-only teams and with fewer errors.

Methodology: This study was approved by the University of Washington IRB. This study randomized PALS trained teams of 3-4 pediatric residents alone or combination with neonatal intensive care nurses to complete four simulations: endotracheal tube (ETT) obstruction, pneumothorax, and ETT dislodgement. The time to bradycardia (heart rate <60 bpm) was the same for all scenarios and heart rate did not recover until all critical steps were completed: confirmation of functioning or replacement of malfunctioning advanced airway (ETT or laryngeal mask airway), decompression of pneumothorax if present, provision of chest compressions for bradycardia and administration of at least one dose of epinephrine. Video recordings of the simulations were reviewed for performance and timing of key steps.

Results: IP teams performed significantly better on time to manual positive pressure ventilation (PPV) and trended towards significance in time to administration of first dose of epinephrine (Table 1). Errors that were common in both groups were: delays in care (63%), medication errors (58%), prolonged interruptions of chest compressions (52%), poor quality chest compressions (47%), and failure to provide predetermined critical interventions within 10 minutes (50%).

Discussion: Though this study is ongoing, there is emerging evidence that IP teams may provide more timely interventions for intubated infants experiencing respiratory decompensation. Both IP and resident only teams exhibited deviation from the PALS algorithm.

Image:
Table 1. Comparison of Measured Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Resident-Only</th>
<th>Interprofessional</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants per scenarioa</td>
<td>3.6(±0.5)</td>
<td>4.7(±0.8)</td>
<td>0.002</td>
</tr>
<tr>
<td>Code calledb</td>
<td>50%</td>
<td>89%</td>
<td>0.14</td>
</tr>
<tr>
<td>Time to manual positive pressure ventilationc</td>
<td>2:08(±0:50)</td>
<td>1:15(±0:48)</td>
<td>0.04</td>
</tr>
<tr>
<td>Time to malfunctioning ETT removald</td>
<td>4:49(±3:44)</td>
<td>4:59(±1:53)</td>
<td>0.92</td>
</tr>
<tr>
<td>Time to epinephrine after heart rate &lt;60bpmc</td>
<td>2:13(±0:55)</td>
<td>1:24(±1:03)</td>
<td>0.16</td>
</tr>
<tr>
<td>Time to replacement of advanced airwayd</td>
<td>8:47(±3:13)</td>
<td>9:15(±2:23)</td>
<td>0.77</td>
</tr>
<tr>
<td>Time to needle decompressione</td>
<td>5:47(±1:16)</td>
<td>4:55(±0:47)</td>
<td>0.09</td>
</tr>
<tr>
<td>Lack of critical steps performed within 10 minutes of bradycardiaf</td>
<td>60%</td>
<td>33%</td>
<td>0.37</td>
</tr>
</tbody>
</table>

*Expressed as mean or percentage. P values were reported from Fisher’s exact test for categorical data or t-test for continuous data.

References:

Disclosure of Interest: None Declared

OP 09-5 – Spaced Scenario Demonstrations Improve Knowledge & Confidence In Managing Acute Illness
Interprofessional Education (IPE)
Submission ID: IPSSW2017-1100

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Background: Accredited simulation courses such as advance pediatric life support and pediatric advance life support are recommended for health care professionals (HCPs) at two yearly intervals as a minimum requirement. There is evidence for an immediate positive effect of these resuscitation simulation courses on medical knowledge, skills, and confidence (1-3). Depending on the initial volume, content and intensity of simulation courses, knowledge, skills, and confidence levels have been shown to decline within a few weeks to several months after course completion (4–14). This calls for novel strategies to retain and reactivate knowledge acquired in medical simulation courses through practical, inexpensive, and time-efficient teaching programs. We designed a spaced education critical care scenario management program to meet this need. Spaced education utilizes the ‘spacing effect’ which refers to spacing and repetition of the education encounters, over a period of time which result in improved retention of learning, compared with more concentrated education encounters (bolus education) (15-17).
Research Question: Can a simple educational intervention program based on repeated observation of brief critical illness simulated scenarios improve the knowledge and confidence of HCPs in managing patients with critical illness? The objective of this study was to evaluate an observation-based, educational intervention program aimed at improving previously acquired knowledge and confidence in managing critical illnesses.

Methods: A prospective cohort longitudinal study was conducted over a 6-month period. Participants were assessed with a knowledge based questionnaire immediately prior to and after observing 12 fortnightly critical illness scenario demonstrations (CISDs). The outcome measure was performance on questionnaires. Regression analysis was used to adjust for potential confounders. Questionnaire practice effect was evaluated on 30 independent HCPs not exposed to the CISDs.

Results: Fifty-four HCPs participated in the study. All participants had previously attended nationally accredited simulation courses with a mean time since last attendance of 1.8 ± 0.4 years. The median number of attendances at CISD was 6 (2–12). The mean questionnaire scores at baseline (17.2/25) were significantly lower than the mean post-intervention questionnaire scores (20.3/25), \( p = 0.003 \). The HCPs self-rated confidence in managing CISD was 6.5 times higher at the end of the program in the intervention group \( p = 0.002 \) than at baseline. There was no practice effect for questionnaires demonstrated in the independent sample.

Conclusion: The educational intervention program significantly improved the knowledge and confidence of the participants in managing pediatric critical illnesses. The CISD program provides an inexpensive, practical, and time effective method of facilitating knowledge acquisition and retention.

Disclosure of Interest: None Declared

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RT 01-1 – Reducing Anxiety Levels In Staff Caring For Patients With Tracheostomies Through Simulation Interprofessional Education (IPE)
Submission ID: IPSSW2017-1101

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Background: Tracheostomies have been widely used since the middle of the 19th century, but despite being one of the oldest medical procedures known, it still causes medical professionals a great deal of anxiety. The commonest fear amongst healthcare workers working with patients who have a tracheostomy is hypoxia resulting from decannulation, bleeding, mucous plugging or complication during routine tracheostomy change. Lack of confidence in caring for these patients relate to infrequent exposure of patients with tracheostomies, lack of formalised teaching and uncertainty regarding local policies. Previous studies have shown that caregiver anxiety with regard to caring for adult patients with tracheostomy at home can be reduced through education and training. We developed an inter-disciplinary tracheostomy study day for general paediatric and PICU nurses and paediatric and anaesthetic trainees.

Research Question: Does participation in a one day multi-modal tracheostomy study day reduce anxiety amongst participants?

Methodology: Participants completed a pre and post course questionnaire including a modified Spielberger State-Trait Anxiety Inventory which is a validated tool to measure anxiety. Data was collected anonymously and analysed using Excel. Means were compared using student t-test and a p-value of <0.05 was considered significant. Free text comments were analysed into themes using a pragmatic approach to framework analysis.

Results: 16 participants attended the study day and completed the pre and post course questionnaire. Pre-course anxiety scores were an average of 9.6 out of a possible maximum of 24. Post-course anxiety scores were an average of 8.2 out of a possible 24. This was statistically insignificant with a p-value of 0.16. There was no
significant difference between anxiety scores between doctors and nurses. 94% of participants felt moderately or very confident in caring for patients with tracheostomies after completing the course. Free text comment analysis showed that much of the anxiety around caring for patients with tracheostomies relates to lack of previous experience and the ‘high stakes’ involved in any complications that may arise. Participants’ views on the structure and content of the course itself will be presented in a separate abstract.

**Discussion:** Our findings suggest that a one day tracheostomy study day including interactive lectures and small group simulation workshops can lead to a reduction in anxiety around caring for patients with a tracheostomy. Though the results are not statistically significant this is likely to be due to small participant numbers and a lack of statistical power and further data will be collected. Our study supports previous literature that suggests that staff are anxious about caring for patients with tracheostomies due to lack of exposure and experience but that this anxiety can be lessened through educational programmes.

**References:**

**Disclosure of Interest:** None Declared

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**RT 01-2 – Going Viral: Spreading Pediatric Simulation Based Education To Community Hospital Settings**

*Innovation/ Future Direction and Outreach Simulation*

Submission ID: IPSSW2017-1035

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**Abstract Body:** Caring for critically ill and medically complex pediatric patients can be challenging, even in settings that care for large volumes of high risk patients. For community based hospitals, this challenge can be magnified due to the rarity of critically ill children presenting in these settings. Simulation based education is a tool that can be used to practice the skills needed for low volume, high risk scenarios that community hospitals may encounter. Recognizing the need for such training, an academic pediatric medical center with an established simulation program partnered with 12 community hospital affiliates (“Outreach sites”) to bring pediatric simulation education into their learning environments.

This educational initiative was launched with the designation of an Outreach Simulation Medical Director from our Division of Hospital-based Medicine to oversee the program. Simulation sessions were scheduled with the educational leadership at each Outreach site, with the goal of conducting 1 simulation session/month with simulation faculty from the academic medical center facilitating. We sought an interprofessional group who cared for pediatric/neonatal patients in the emergency department, pediatric, delivery room and nursery settings. In addition, the educators at each Outreach site attended a 2 day, Simulation Basics for Healthcare Educators course, to prepare them to run simulations and debriefings independently at their sites.\(^1\)
Each participant in the Outreach simulation was given an evaluation form regarding their experience following the session. A total of 344 learners attended a simulation session throughout the 12 Outreach sites. 307 (89%) learners completed the evaluation. 99% of respondents Strongly Agreed/Agreed that “The Case content was relevant to my clinical practice.” 97% of respondents Strongly Agreed/Agreed that “Today’s event will improve my clinical practice.” All 12 of the Outreach sites have begun to implement monthly simulation sessions as part of this program.

The educational initiative to advance simulation based education to community hospitals has met with initial success. Faculty from the medical center simulation program have been able to facilitate simulation learning at one Outreach site each month. All 12 of the Outreach sites have begun to conduct simulation training on a monthly basis. The Outreach sites report their simulation activity to the Outreach Simulation Medical Director and simulation based process improvements occur at each site following their simulations. Areas of improvement that have been identified include: increasing the number of Outreach site simulations to more than one per month, recruiting more simulation faculty to facilitate Outreach site simulations, customizing site specific simulation scenarios. This initiative has implications for the pediatric healthcare simulation community in that it serves as a model to expand simulation education in more diverse settings.

References:

Disclosure of Interest: None Declared

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RT 01-3 – Pediatric Hospitalist Neonatal Simulation Education Curriculum

**Innovation/ Future Direction and Outreach Simulation**

Submission ID: IPSSW2017-1133

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**Background:** At the Floating Hospital for Children at Tufts Medical Center, pediatric hospitalists (PH), supervised by neonatology staff, provide neonatal care in our community Special Care Nurseries (SCN) functioning as the primary provider for deliveries and management of sick neonates on weekends and evenings. While a neonatologist is always accessible, at times, PH are the only pediatric-trained provider on site. Our division is proud to be a leader in the field of PH Medicine, specifically in the areas of patient safety and quality improvement. To remain at the forefront, we propose a step-wise implementation of a “train-the-trainer” model for long-term, site-based simulation training to accomplish our goal of maintaining high-quality PH neonatal skills while enhancing neonatal care and patient safety.

**Educational Goals:** Improve PH confidence, competence, and medical care for neonates at community hospital setting.

**Proposed Approach:** Using the skills acquired at Comprehensive Instructor Training Workshop at the Center for Medical Simulation, we will train Level II hospitalist and nursing Simulation Champions and Level II SCN directors to facilitate a sustainable inter-professional high- and low-fidelity Neonatal Simulation curriculum. We aim to have inter-professional simulation teams at each site provide monthly simulation sessions rather than the current biannual schedule. The initial structure includes didactic sessions, small simulation teaching sessions, and a 1-day retreat with large scale high-fidelity simulations at the TUSM simulation center. In addition to enhancing competence in neonatal care, participants will be educated on execution of simulation scenarios and debriefing sessions. Ultimately, a low fidelity doll and Ipad will be supplied to each Level II site along with access to an online simulation case catalog to facilitate monthly simulations run by the hospitalist and/or nursing champions. We will assess PH confidence and competence through self and colleague (neonatology) evaluations and pre/post medical knowledge questionnaires. Quality improvement in neonatal medical management will be measured using surrogates such as APGAR scores, admission temperature, IVH severity, and blood gas results post delivery room resuscitation. Re-evaluation of the program will occur annually with
neonatology and pediatric hospitalist leadership. A significant barrier anticipated is lack of allocated, protected time for nursing and PH simulation teams to attend monthly meetings at Tufts.

Discussion Questions:
1. Should implementation occur at seven community hospitals simultaneously or in at a single site in step-wise fashion?
2. Suggestions for other measureable patient outcomes?
3. Monthly simulations will be inter-disciplinary, however, is it necessary to train an inter-disciplinary team?
4. Is it beneficial to run mega-mock events at the TUSM simulation center biannually in order to assess progress at each level II site?

Disclosure of Interest: None Declared

RT 01-4 – Pediatric Blunt Abdominal Trauma Cognitive Task Analysis
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1036

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Background: Injury is a leading cause of death in the pediatric population. Unfortunately, pediatric trauma education is challenged by duty hour restrictions for trainees; limited high acuity patients for practitioners in rural settings; and sparse resources to teach pediatric trauma decision-making for practitioners. Training focused on improving decision-making skills will enhance a practitioner’s ability to manage emergent pediatric trauma resuscitation. Cognitive task analysis (CTA) is a method to dissect a task or skill into critical steps by identifying the associated cognitive decisions (Sullivan, Ortega, et al, 2008). The concepts, principles, and practices that characterize expert performance can be mapped or scripted for teaching and learning by non-experts such as novices. At this time, CTA has not been used to capture knowledge from experts for use in pediatric trauma management. The CTA in this study will focus on blunt abdominal trauma as it is the most common unrecognized fatal injury and the third most common cause of pediatric trauma mortality (Schacherer, Miller & Petronis, 2014).

Research Question: What is the clinical decision-making process of pediatric management for blunt abdominal injury using cognitive task analysis?

Proposed approach to addressing the question: This is a single site qualitative study utilizing CTA during interviews with experts from Pediatric Emergency Medicine and Pediatric Trauma Surgery to outline the clinical decision-making process of pediatric management for blunt abdominal trauma. Key findings from interviews will lead to the development of an algorithm, which can be used as a tool for teaching through simulation and/or serious video games.

Conundrum or difficulty encountered: To achieve consensus from experts regarding key clinical decision making and management of pediatric blunt abdominal trauma.

Questions for discussion:
- Who should be included as an external expert? Should we expand the design to include national or international experts?
- What are suggested ways to build consensus?
- How can we improve the algorithm?

References:

Disclosure of Interest: None Declared

RT 01-5 – Evaluation of the Impact of a Pediatric VAD Simulation Training Program for Patients and Caregivers
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1260

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Background: Patients and caregivers require extensive training to be safely discharged home on a HeartWare Ventricular Assist Device (VAD). Despite receiving comprehensive in-hospital training by expert clinicians, patients and their families report high anxiety and poor self-efficacy in performing specific tasks related to VAD care, often resulting in increased hospital length of stay (LOS), frequent readmissions and possible life threatening adverse events. The purpose of this program will be to explore the feasibility of using medical simulation to prepare patients and families/caregivers going home with a HeartWare VAD.

Educational Goal: Medical Simulation is regularly used to train and prepare clinicians but less frequently to prepare patients and families returning home with complex medical needs. At our institution, the Boston Children’s Hospital (BCH) Simulator Program has developed a “Preparing You” service line to provide hands-on simulation teaching for patients and families. Through this program, patients/providers will have the opportunity to engage in the following simulated scenarios: how to perform a driveline exit site dressing change, how to measure a mean arterial blood pressure (MAP) utilizing a Doppler machine, how to go through a morning VAD routine (weight, measure MAP, record VAD settings, contact VAD team), how to respond to a high priority alarm and perform a controller exchange, how to pack an emergency bag, how to respond to your child who is pre-syncopal, and how to respond to a high priority alarm where the VAD has no power. Simulation scenarios will be taught by VAD nurse practitioners.

Research Question: This study will address whether participation in simulation scenarios:
1. Increases patient and parent/caregiver self-efficacy performing specific tasks related to VAD care.
2. Decreases patient and parent/caregiver anxiety caring for the VAD
3. Decreases adverse medical events, patient LOS and hospital readmissions

Methods: In this study, we survey patients and parents/caregivers regarding anxiety and task specific self-efficacy at various points in time (pre discharge/pre sim, pre discharge/post sim and post discharge). As secondary outcomes, we also track individual patient LOS, readmissions and adverse medical events. Inclusion criteria include: family of child aged <18 years implanted with HeartWare VAD and deemed medically stable by clinical staff.

Difficulties Encountered: Former VAD families/patients provided feedback on the simulation space, scenarios and technology (mannequin). Families reported concerns related to the technology and requested that the mannequin be adapted to best reflect common VAD sounds. To address this concern, we adapted the mannequin by implanting Bluetooth wireless speakers into the mannequin allowing for the turning on or off of the VAD inside the mannequin’s chest.

Disclosure of Interest: None Declared

RT 02-1 – Integration Of Maternal And Newborn Resuscitation Training In The Dominican Republic
Educational Outreach (Including remote, rural and international simulation education)
Submission ID: IPSSW2017-1095
Alexandra Leader¹, Jose Flores Rodarte², Luis M. Peña³, Claudia Cadet⁴, Lloyd Jensen⁵
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**Background:** Of more than 300,000 maternal deaths that occur each year, 99% occur in developing countries. 75% of these deaths are due to severe bleeding, infections, hypertension, complications from delivery, and unsafe abortion, causes which are likely preventable with access to high-quality emergency obstetric care (EmOC).¹ Maternal mortality also confers increased risk of perinatal mortality,² with newborn mortality rates up to 5 times higher in low resource health care facilities with low-quality basic emergency obstetric (OB) care procedures.³ The Dominican Republic (DR) has one of the highest maternal mortality ratios (92 per 100,000 births)⁴ and neonatal mortality rates (22 per 1,000 live infants)⁵ in Latin America. While simulation-based training programs in neonatal resuscitation and care are being used to address neonatal mortality in the DR, Helping Mothers Survive (HMS), a simulator-based training program aimed at managing OB emergencies in low resource settings has never been integrated into maternal-child health training in the DR.

**Aim:** Implement HMS Master Trainer (MT) courses, disseminate provider training courses, and conduct EmOC clinical practice monitoring alongside neonatal resuscitation training and assessment to comprehensively strengthen the continuum of maternal-child health in the DR.

**Methodology:** IRB approval/exemption was obtained at EVMS. Working closely with the Ministry of Health (MOH), 20 local OB champions from 9 different hospitals in Santo Domingo participated in an HMS Bleeding After Birth MT course in October 2016. Participants were given training materials to implement provider courses. A second HMS MT course was given in Santiago in conjunction with a Helping Babies Breathe simulation-based neonatal resuscitation course. 29 multidisciplinary champions from 17 different hospitals in the northern region of the country were trained in HMS and given training materials for program dissemination. Program dissemination and assessment was specifically planned for the main public tertiary care center in Santiago and the MOH designated a local obstetrician to direct regional HMS program dissemination.

**Results:** Program outcomes include:
- HMS MT session in Santo Domingo for 20 MDs from 9 hospitals
- HMS MT session in Santiago for 15 MDs and 14 nurses from 17 hospitals
- Participant characteristics and qualitative course evaluations pending data analysis
- Regional team for EmOC training established by MOH

Clinical practice outcomes include:
- Gives uterotonic medication within one minute of delivery of infant
- Assesses fundal tone immediately following delivery
- Checks woman’s bleeding

**Challenges/questions identified to date:**
- Determine maximum interval for EmOC skill refreshers
- Obtain local institutional support for training time
- Ensure that providers use data collection tools for clinical practice
- What is the optimal regional model for simulation training given increasing number of available courses?

**References:**
RT 02-2 – Combined HBB/ECEB Simulation Training, A 2-Year Experience In The Dominican Republic.

*Educational Outreach (Including remote, rural and international simulation education)*

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**Background:** The Dominican Republic has one of the highest rates of neonatal mortality in Latin America at 22 per 1000 live infants. Helping Babies Breathe (HBB) has been shown to significantly reduce neonatal mortality. Essential Care for Every Baby (ECEB), a complementary educational module targeting improvement in early newborn care, has not yet been evaluated extensively.

**Aim:** Multidisciplinary implementation of HBB/ECEB courses supported by the Ministry of Health (MOH) with follow up coaching and quality improvement (QI) monitoring will result in improved regional neonatal outcomes.

**Methodology:** Research team and regional MOH identified champions from pilot sites to participate in a master trainer course (train-the-trainer model) and QI program for 17 providers from 5 different hospitals in Santiago. Training and clinical materials were provided for course implementation at each site. Pre-intervention data of key indicators was collected and QI notebooks placed at each facility. Trainers facilitated courses for maternal-child health personnel at their sites. Course data was collected. Neonatal transfer data and NICU mortality was collected at the Children’s Hospital to monitor outcomes of newborns transferred from the 5 pilot sites. Support for local trainers was provided for initial facility program implementation. 1-year post-intervention, the research team, MOH, and master trainers conducted a second HBB Master Trainer course in Santiago (ECEB not taught). 5 local master trainers co-led the training. 37 nurses and doctors representing 17 health centers from the Northern region were trained. As part of a complementary QI module, the 2015 master trainers shared their experiences of program implementation over the past year, and facilitated planning of training sessions and QI monitoring with 2016 master trainers.

**Results to date: (data collection/analysis in progress)**

1) Program evaluation:
   - 4/5 targeted sites implemented provider trainings
   - 164 providers trained in HBB, 124 in ECEB
   - Program pre/posttest evaluations collected
   - Qualitative evaluation of implementation challenges

2) Monitoring of clinical practice outcome measures (%): need for bag-mask ventilation, hypothermia at 1 hr life, pre-transfer antibiotics

**Discussion:**

1) Difficulty sustaining master trainers’ motivation to implement program
2) Difficulty in maintaining skill level of both trainers and trainees
   - During coaching sessions, it is noted that confidence and skill level declined over time
3) Barriers to conducting courses: accessibility of materials in hospital, securing institutional support for training time, securing ongoing program support from hospital and government administrators
4) Barriers to data collection
   - Can we obtain accurate neonatal mortality data from MOH and each institution?
Inconsistent use of QI data collection tools
5) Difficulty changing health care practices and institutional “culture” at each center
6) How can we improve training and evaluation process going forward?

References:

Disclosure of Interest: None Declared

RT 02-3 – Simulation Training Impacts Staff Perceptions Of Teamwork During Real PICU Crisis Events
Interprofessional Education (IPE)
Submission ID: IPSSW2017-1106

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Background: Simulation training can improve communication among interdisciplinary teams. Few studies have evaluated how skills learned within the simulation environment effect team performance at the bedside.

Objective: To evaluate if simulation based team training (SBT) changes how staff perceive their teamwork during real emergency events. Hypothesis: Team members will overestimate their teamwork skills during real emergency events in our ICU prior to SBT.

Methodology: For 9 months prior to SBT, bedside staff used the Clinical Training Scale Tool (CTS) to assess team performance immediately following real emergencies in the PICU. The assessment tool was completed by physicians, respiratory therapists (RTs), and nurses involved in the event as well as simulation experts. The CTS tool delineates 5 categories; communication, situational awareness, decision making, and role responsibility on a 10 point Likert scale (0; unacceptable, 10; perfect). Following data collection, 166 PICU staff members completed a 3-hour simulation session, followed by a debrief focused on team performance. Debriefs were modeled after the PEARLS blended approach. Assessment of emergency events using the same validated tool continued following SBT. Performance ratings were tested using Least Squares means differences in SAS PROC GENMOD for clustered events. To assess changes in ratings from SBT over time, interrupted time series (ITS) via segmented regression models were applied.

Results: A total of 75 events and 211 assessments were completed prior to SBT, 9 events and 23 assessments were completed following training. There was a significant difference in the overall teamwork rating between simulation experts (N=41, mean (SE): 5.1(0.24) and bedside staff (N=104, 6.6 (0.22), P<0.001). Mean differences between individual survey items were also significant (P< 0.005). Initial aggregate analysis of staff evaluations of real time events following training showed that there was a significant decrease in mean scores in the areas of overall communication (7.3 (0.23) to 6.2 (0.49), P=.0482), use of SBAR (7.0 (0.35) to 5.7 (0.49), P=.0121), transparent thinking (7.4 (0.24) to 6.4 (0.42), P=0.0373), and situational awareness (7.8 (0.12) to 6.7 (0.49), P=.0395). ITS models for estimating intervention effects also showed a downward trend in communication, situational awareness, and role clarity scores immediately following simulation. Parameter estimates for segmented regression models predicting mean situational awareness score over time showed a
mean (SE) score of 7.5 (0.36). Following intervention, the mean (SE) score decreased by 2.5 (1.47) points, although this was not significant (P=0.0967).

**Discussion:** Simulation based training impacts how staff perceive their team performance in real time. The downward trend in scores following training suggest that team members successfully learned concepts taught during SBT and recognize imperfections in teamwork during crisis events.

**Image:**

<table>
<thead>
<tr>
<th>Parameter estimates from segmented regression models predicting mean Situational Awareness over time.</th>
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<tbody>
<tr>
<td><strong>For Situational Awareness</strong></td>
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<tr>
<td>Intercept, β₀</td>
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<tr>
<td>Baseline trend (days), β₁</td>
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<tr>
<td>Score change after intervention, β₂</td>
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<tr>
<td>Trend change after intervention (days), β₃</td>
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**Figure 1. Interrupted Time Series for estimating intervention effects**

β₀ = baseline score at beginning, before the intervention (07/18/2016-09/12/2016)
β₁ = change in mean score before the intervention (eg. baseline trend) (baseline slope)
β₂ = level change in mean score immediately after the intervention period.
β₃ = change in mean score after the intervention

**References:**


Disclosure of Interest: None Declared

RT 02-4 - Simulation Driven Interprofessional Conceptual Framework For Managing Ventilated Pediatric Patients

Interprofessional Education (IPE)

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Background: The complexity and volume of pediatric patients who require mechanical ventilation continues to rise. Mismanagement of ventilated patients can result in increased morbidity and mortality. As technological advances in ventilators continue to emerge, the technical aptitude and specialized care required to manage ventilated pediatric patients, coupled with the decentralized hospital environment, creates challenges in providing consistent training across professions (respiratory therapists, physicians, and nurses) and measuring staff competency and knowledge retention. A robust training program that incorporates a unified approach to caring for ventilated patients and leverages each profession’s core competencies is needed to optimize patient outcomes and prevent harm.

Educational Goal: To create an overarching conceptual framework on managing ventilated pediatric patients amongst respiratory therapists, physicians, and nurses. Aspects of this goal include:
- Increasing technical aptitude
- Benchmarking and tracking ongoing performance
- Retaining knowledge and skillset
- Improving teamwork and communication

Proposed Approach: A ventilator simulator (IngMar’s ASL 5000) will be incorporated as part of a comprehensive curriculum. Because of the many challenges involved with interprofessional education in a hospital setting, we propose using just-in-time and just-in-place training methodologies and in situ simulations. Our proposed methodology is the following:
- Timing: 10 minute modules
- Module structure: similar for all groups with adaptations per profession
  - Respiratory therapist: technical aptitude and vent management
  - Resident: basic technical skill with heavier emphasis on conceptual framework
  - Nurse: basic technical aptitude and conceptual framework
  - Same equipment and simulators will be used with all groups
- Module content: initial settings, patient synchrony, graphic interpretation, troubleshooting, vent management strategy, and disease process factors
- Assessment:
  - Pre and post training confidence survey
  - Basic scorecard to benchmark and track performance
Learners who complete most or all the modules will be recruited to participate in multidisciplinary simulation scenarios on ventilated patients, where the learning objectives will be focused on communication, teamwork, and process flow.

Challenges:
- Limited resources (time, staff, equipment)
- Planning, coordinating, managing
- Overall buy-in from multiple stakeholders
- Learner participation
- Disruption

Questions:
- How to get multiple disciplines invested
- What data to collect and measure
- How to track learner progress
- How to debrief during multidisciplinary sessions
- Reports and deliverables
- Opportunities for research
- Correlating program to improved patient outcomes

Disclosure of Interest: None Declared

RT 02-5 – Mastering Interpersonal Milestones: Adapting Spikes To Critical NICU Communication

Simulation instruction design and curriculum development
Submission ID: IPSSW2017-1062

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Background:
Traditionally medical training roots itself in scientific instruction. Formal curriculum development of the “art of medicine” relies heavily on trainees’ observations of senior faculty. This lack of structure and variability is reflected in the instruction of physician/patient communication, especially in regards to the delivery of “bad” or emotionally distressing news. Clearly there is a need to develop a concrete approach to teach these vital communication skills that are essential in a high stakes environment, such as the neonatal intensive care unit (NICU). The SPIKES protocol, in combination with simulated patient training, has offered a specific method in which medical education can improve its pedagogy.

SPIKES was developed as a six-step protocol to deliver “bad news” to oncology patients. While its application has expanded to the emergency department and the adult intensive care unit, it’s potential impact in the setting of pediatrics, specifically the NICU, has yet to be studied.

Education Goal: Participants will improve confidence in delivering critical NICU communication while also gaining translatable skills directed toward achieving a level 2 or greater in the following ACGME milestones:
- Interpersonal and communication skills 1 and 2
- Professionalism 1-4 and 6
- Practice based learning and improvement 1, 3 and 4

Additionally, by the end of this curriculum residents will be able to:
- Recall and implement the six steps of the SPIKES protocol
- Differentiate and discuss effective and non-effective physician-patient communication styles
- Identify and evaluate personal roadblocks and limitations in delivering “bad news”
- Develop and apply communication strategies to overcome personal roadblocks
Proposed Approach: The targeted participants will be first year pediatric residents within the University of Chicago- Comer Children’s Hospital. Prior to starting the education session, participants will complete a confidence survey regarding delivery of bad news utilizing a Likert scale. Participants will then receive a targeted didactic session on the SPIKES protocol, during which they will watch videos, modeling both a poor physician patient interaction and demonstrating physician patient interaction using the SPIKES protocol. Following this, participants will undergo two video-recorded simulated neonatal based patient scenarios after which they will receive real-time debriefing. Upon conclusion of the session, they will complete a post experience survey. Simulated patients will complete a checklist of predetermined objectives to assess the participant’s skills. Three months later, participants will complete a follow-up simulated patient interaction using the same checklist and the same confidence survey in order to assess confidence and retention of skills.

Image:

Appendix A.

Pediatric Milestones addressed by the SPIKES Communication Curriculum

Practice based Learning and Improvement

#1 Identify strengths, deficiencies, and limits in one’s knowledge and expertise
#3 Systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement
#4 Incorporate formative evaluation feedback into daily practice

Interpersonal and Communication Skills

#1 Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds
#2 Demonstrate the insight and understanding into emotion and human response to emotion that allows one to appropriately develop and manage human interactions

Professionalism

#1 A sense of duty and accountability to patients, society, and the profession
#2 Professional Conduct: High standards of ethical behavior which includes maintaining appropriate professional boundaries.
#3 Humanism, compassion, integrity, and respect for others; based on the characteristics of empathetic practitioner
#4 Self-awareness of one’s own knowledge, skill, and emotional limitations that leads to appropriate help-seeking behaviors
#6 Recognize that ambiguity is part of clinical medicine and to recognize the need for and to utilize appropriate resources in dealing with uncertainty.
Appendix B:

References:

Disclosure of Interest: None Declared

RT 03-1 – Use Of Simulation To Assess Pediatric Critical Care Fellow Resuscitation Competency
*Assessment (including use and validation of measurement and assessment tools)*
Submission ID: IPSSW2017-1086

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Abstract Body: Over the past several years, medical education in the United States has moved toward competency based assessment, using both milestones and entrustable professional activities to determine a trainee’s readiness to practice independently. Use of milestones requires more extensive observation of a trainee by supervising physicians; unfortunately, an attending may have limited opportunity to observe a fellow in a specific scenario, given the number of fellows and attendings and the relative rarity of events. This makes it significantly harder to assess a fellow’s competency and longitudinal change. With the support of the pediatric critical care medicine fellowship program leadership, we propose to use a bi-yearly, longitudinal simulation
curriculum to assess critical care fellows’ competency in management of acute decompensation in the pediatric intensive care unit. Trainees will be rated using a scenario-specific checklist of observable behaviors and previously validated simulation assessment tools. A faculty member/rater will facilitate each simulation. Fellows will be assessed on both medical management and team leader/communication skills. The results will be used to determine in what areas the fellow requires remediation. Each session will be filmed to allow the simulation faculty facilitator time to review the video for any missing checklist items and for the trainee to review their performance at a later time. The first session is planned for December 2016. We hope to integrate this curriculum as a required component of the fellowship program and also to expand the curriculum to other pediatric critical care medicine fellowship programs. These simulations represent another method of formative and summative assessment that program directors may use to determine competency of trainees.

Research Question/ Educational Goal: Development of a robust, longitudinal simulation curriculum used for assessment of pediatric critical care fellow competencies that can be generalized to other pediatric critical care training programs as well as to adult critical care medicine training programs.

Conundrum or Difficulty Encountered: We would like feedback on the best method for evaluating the fellow during the simulation. We are planning to employ both checklists and global ratings scales but want to ensure that our assessment method is both valid and reliable as stakes will be attached to the assessment.

Questions for discussion: Who should be the rater scoring the simulation session? Can members of the study team be the rater or should it be an independent rater? Should the simulation session but evaluated in real time or using video review? Should debriefing be provided? If so, should it be provided in real time (i.e. immediately following the simulation scenario) or after the session (i.e. days later)?

Disclosure of Interest: None Declared

RT 03-2 – Use Of Medical Simulation To Educate Healthcare Providers In A Nascent Pediatric ECLS Program

Simulation instruction design and curriculum development
Submission ID: IPSSW2017-1206

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Context: Simulation has been shown to improve team performance and clinical skills.1,2,3,4 We hypothesized that simulation would be an effective primary method to train a large multidisciplinary team on a new technology prior to caring for patients. We describe the creation of a pediatric extracorporeal life support (ECLS) curriculum using simulation as a tool to teach current standards of practice to a novice, multidisciplinary audience prior to caring for the first patient.

Description: In January 2016, New York Presbyterian Hospital funded the creation of a clinical pediatric ECLS and education program at Weill Cornell Medicine. The ECLS curriculum included 3 major components: 4-hour didactic sessions on basic ECLS concepts followed by monthly 1-hour lectures; 1.5-hour circuit labs teaching the function of extracorporeal membrane oxygenation (ECMO) circuit components; and 3-hour high fidelity (HF) ECMO simulation (SIM) focusing on identifying and managing ECMO emergencies. A group of 21 Superusers from 6 disciplines also participated in a 3-day course with the goals of 1) solidifying ECMO knowledge and skills and 2) providing simulation instructor training by experts from Boston Children’s Hospital (BCH). Superusers then trained the remainder of staff (nurses, perfusionists, respiratory therapists, mid-level providers, fellows, and attendings from pediatric and neonatal intensive care unit (PICU, NICU), pediatric surgery and cardiac surgery) using the framework above. 127 learners completed training between January and December 2016.

Observation/Evaluation: Quizzes submitted pre- and post- circuit labs showed knowledge acquisition (53% pre-vs. 81% post). Superusers were evaluated by experts at BCH by direct feedback on performance through simulation and debriefing. The same experts returned 7 months later to audit superuser performance in running
and debriefing 3 HF ECMO SIMs, with observations of improved confidence, accurate delivery of information, and a debriefing style that encouraged the expression of individual/team strengths and weaknesses. Feedback from learners overall showed improved comfort in potentially caring for ECMO patients, understanding ECMO circuit physiology and management of possible complications. Learners expressed improved camaraderie and trust amongst NICU, PICU, perfusion and surgical teams. In total, 28 circuit labs and 42 HF ECMO SIMs (30 scenarios, 2 per SIM session) were performed between April and December 2016.

**Discussion:** Using simulation as the crux of our pediatric ECLS training curriculum, we have improved health care providers’ comfort level, knowledge and ability to troubleshoot problems on ECMO prior to caring for a patient. Aided by an expert center, we created a new pediatric ECLS program at an institution that had no prior experience with ECLS. New clinical programs can be introduced safely using simulation at the outset, to foster learning in a realistic environment that is far from patient harm.

**References:**

**Disclosure of Interest:** None Declared

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RT 03-3 – A Model For Integrating Interprofessional In-Situ Neonatal Simulation Into A Staff Update Programme

*Simulation instruction design and curriculum development*
Submission ID: IPSSW2017-1143

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**Context:** Interprofessional simulation-based education allows professionals to develop collaboration skills & team functionality1, paramount for patient safety in critical care settings2. Due to organisation pressures, time for staff mandatory update, in a busy newborn intensive care unit with over 250 nurses, needed reducing. The previous update included a newborn life support3 (NLS) refresher. Highly-valued, interprofessional in-situ simulation, covering technical & human factor skills, also occurred. Only 33% of nurses could access this due to unit pressures. A new framework for delivering interprofessional in-situ simulation and providing an NLS update was required to allow all nurses & junior doctors to receive this training in the year.

**Description:** The unit leads for simulation, nurse education & the lead nurse discussed the organisation expectations and provisions for faculty training & availability. The interprofessional simulation was embedded in a 2-hour slot in the time-protected yearly mandatory update programme. The participant setup mirrors that in the workplace. Technical & human factor learning objectives are delivered using real anonymysed scenarios, in line with interprofessional learning practices.4,5 A multiprofessional faculty, trained in facilitation & debriefing practices (unit funded), is used. Recognised facilitation & debrief principles6,9 and models10 are used. The participants’ airway management skills are assessed after a faculty-led debrief & participant reflection. The simulations are evaluated on multiple levels: participant, facilitator & organisation;
aiding sustainability. A framework for the setup of interprofessional in-situ neonatal simulation has been devised based on relevant literature and simulation evaluations.

**Observation/Evaluation:** From July–December 2016, over 50% of nurses & all junior doctors undertook at least one simulation. Staff describe the experience as ‘invaluable’, increasing their technical skills & confidence in communication, leadership & situational awareness. The core simulation faculty now includes 3 clinicians, 5 nurses & 2 nurse practitioners, all with training in education theory, human factors & debriefing principles. The simulation programme meets the organisation requirements & provides a forum for training from root-cause analyses. The framework, based on educational principles, has been effective iteratively.

**Discussion:** This framework describes the considerations for establishing interprofessional in-situ simulation in a mandatory programme and may provide other simulation enthusiasts with a framework to implement a similar programme in their workplace. Interprofessional training would be beneficial for other professionals involved in the perinatal process, e.g. midwives, obstetricians & anaesthetists, improving both maternal and neonatal outcomes. This framework may aid considerations around organisation, participant and faculty requirements, for designing such programmes.

**References:**

**Disclosure of Interest:** None Declared

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**RT 03-4 – Distress Debriefing Training for Pediatric Intensive Care Unit Nurses**

**Debriefing and teaching methodologies**
Submission ID: IPSSW2017-1235

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**Background:** Moral distress and burnout can affect nursing staff at any point during their nursing career (Maslach & Leiter, 1997). While nurses do not hesitate getting treatment for a broken arm, they often struggle to seek help when experiencing a psychological injury. The Pediatric Intensive Care Unit (PICU) at Children’s
Minnesota cares for many medically complex patients; the burden of caring for acutely-ill children day in and out can weigh heavily on nursing staff. Education and leadership staff identified the need to provide support soon after a critical event by providing a focused, short debriefing session, or defusing, facilitated by charge nurses. Defusings are a brief, informal debriefing technique within the umbrella of Critical Incident Stress Debriefings (Mitchell, 2015).

**Research Question/Educational Goal:** The goal of this training is to empower charge nurses to use defusings in identified situations, such as an unexpected death or resuscitation. Charge nurses were chosen to receive the initial training for their leadership qualities. Ideally this debriefing would lower tension around emotionally-challenging patient situations, thereby promoting healthy coping and unit cohesiveness.

**Proposed approach:** A survey was conducted prior to the training regarding feelings/thoughts of moral distress and burnout. A post survey will be conducted approximately 3 months after our initial training to measure how/if the training is being used and if is helpful for staff. Charge nurses from all shifts voluntarily signed up for one 4 hour session. Sessions consisted of a brief didactic portion, and simulation for skill practice. Groups were kept small, between 5-8 participants. 21 nurses were initially trained. Defusings, or as we have named it, Distress Debriefing, will consist of a short (15-20 minute) debriefing session to help normalize responses and identify further support needs.

**Challenges/Difficulties:** One of biggest challenges will be encouraging charge nurses to utilize this technique in real situations. Many charge nurses were concerned about how to staff the unit, even for a short time while this debriefing is taking place. Continuing training: we would like to extend training to all critical care areas and the Emergency Department. We have two campuses to consider as well, and only 2 staff teaching this course, it may be difficult to timely train all staff.

**Questions for discussion:**
- Other than a post-survey, are there other outcome measurements we should utilize? Meaning, how do we know this is making a difference? Would like to consider other measurements other than anecdotal evidence.
- Encouraging and empowering staff to make this part of the unit’s culture. How do we maintain support for charge nurses to use this in practice?
- Further implementation and sustainability: how do we extend training, if found to helpful for staff? How do we continue to maintain this training?

**References:**

**Disclosure of Interest:** None Declared
evaluations and constructive student comments to help us redesign and advance our pediatric simulation program.

The Maternal Child Health curriculum for the ASBN program initially involved each student attending one four hour simulation labs during their pediatric rotation. The Pediatric Course Coordinator assigned nine to twelve students to attend each session. During the four hour session, the simulation instructors divided students into groups consisting of 3-4 students. Each group participated in 3 clinical scenarios. The objective of each scenario focused on safety, assessment and communication in the care of pediatric patients and their families. The scenarios were progressive in nature, requiring more challenging problem solving, clinical judgment and clinical reasoning as students advanced from one scenario to the next.

At the end of the semester, the course coordinator and the two pediatric simulation lab instructors reviewed the student evaluations to identify areas for improvement. We modified the program and scenarios to animate the content that students learned in lecture prior to attending simulation, hypothesizing that this approach may provide a more affective learning experience. Each student now attends two simulation sessions that each last 2.5 hours. Every student participates in two scenarios at each session. The simulation orientation and objectives remained the same but we incorporated the use of a simulation patient plan of care worksheet. Each student group is provided time to complete this worksheet after being provided a report on their scenario patient and prior to entering the simulation lab. Scenario specific objective sheets which incorporate goals for safety, assessment and communication, were also developed which improved the debriefing process.

We believe our program has benefitted from incorporating the student evaluation input. Student evaluations reflect improved satisfaction with feeling safe and better prepared for their simulation experience. Student comments also express having the opportunity to collaborate and develop a plan of care utilizing the simulation process.

References:
7. Limoges, J. An exploration of ruling relations and how they organize and regulate nursing education in the high-fidelity patient simulation laboratory. Nursing Inquiry. 2010; 17(1); p. 57-63.


Disclosure of Interest: None Declared

RT 03-6 – Simulation For New Construction And System Testing
Process Improvement and organizational change
Submission ID: IPSSW2017-1138

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Expert Panel Discussion:
Opening a new clinical space or implementing a new clinical process creates potential patient safety threats and challenges providers. Days after moving into a new clinical unit- front-line staff are often confronted with layouts that don't meet their needs, are inefficient or even unsafe for care. Simulation is increasingly being used for systems, environment and process design and testing. Simulation can be utilized at every phase of planning to identify, prevent, prepare for and monitor latent safety threats. In addition- integrating simulation prior to constructing new clinical spaces can save costs by optimizing layout according to work as done, not only as imagined.

This expert panel consists of several presenters with experience and expertise in using simulation in situ or in a center to prepare, assess and plan for the opening new clinical environment or process of care. Several of the authors have extensively lectured on this topic in various international settings. We will discuss some of the pearls and pitfalls of this burgeoning use of simulation during an interactive panel discussion. Discussion topics will include: Return on investment, engaging stakeholders, conducting a needs assessment, right tools for the job, planning an assessment, debriefing considerations and follow-up planning. Attendance will give participants practical information about how to effectively plan for, implement and assess a simulation project for this purpose.

The panel session will consist of Q&A style discussion, pro/con debate, and expert accounts of utilizing this methodology.

References:

Disclosure of Interest: None Declared
RT 04-1 – Development of a Tool to Evaluate Hazards in Clinical Environments Using Simulation

**Patient safety and quality improvement**

Submission ID: IPSSW2017-1244

Barrett Seay¹, Sarah Aspinwall¹, Lorraine Daniels¹, Howard Brightman¹, Peter Weinstock² ³, Catherine K. Allan* ² 4

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**Background:** Physical elements of clinical spaces may impact patient safety through adverse effects on processes, infection control practices, and ability to monitor patients. Simulation is increasingly used for surveillance of current clinical spaces, post-construction evaluation of new environments, and pre-construction guidance of facility design. Previous work in this area has relied heavily on qualitative debriefing and has lacked rigorous hazard definitions. We describe the development of a standardized hazard assessment tool and the pilot application of the tool to discriminate between two critical care environments utilized for high-risk procedures such as cannulation for Extracorporeal Membrane Oxygenation during CPR (ECPR).

**Research Question:** We hypothesized that specific hazards to patient and healthcare providers related to the physical environment can be identified through application of prospectively defined hazard categories (hazard assessment tool) during video review of high fidelity critical event simulations, such as ECPR, and that application of this tool can objectively distinguish between 2 different Intensive Care Unit rooms of differing sizes.

**Methods:** A panel of 5 experts in Simulation, Pediatric Cardiac Intensive Care, Process and Quality Improvement, and Safety utilized consensus methodology to define categories of observable safety hazards. In a proof of concept study, the tool was applied to 2 Cardiac Intensive Care Unit (CICU) rooms - a scale architectural mock-up of a future CICU room and a currently operational CICU room – with patient care areas of 240 vs 300 sq ft respectively. Video recordings of standardized high fidelity ECPR simulations were reviewed to obtain a hazard rate (# hazards/min) for each environment.

**Results:** The consensus process identified 7 hazard categories (impaired access to patient, impaired access to equipment/supplies, inadequate visibility, risk of slip/trip/fall, ergonomic risk, infection control risk, obstructed workflow). 69 distinct hazards were identified during a single ECPR event in the mock-up environment. Of these 69 observations, 11 represented a hazard in 2 or more categories. Application of the hazard model to video recordings of ECPR simulations discriminated between 2 different sized CICU rooms, with a hazard rate of 3.8 hazards/min for the 240 sq ft room versus 2.1 hazards/min for the 300 sq ft room.

**Conclusions:** A hazard assessment tool was developed to assess risks in critical care environments during simulations of critical clinical events. Pilot application of the tool successfully discriminated between 2 different CICU rooms. As simulation is increasingly used to guide facility design and to evaluate clinical environments, quantitative tools such as the hazard assessment tool will provide objective data to guide decision-making. Additional work is required to assess inter-rater reliability and generalizability of the tool to other clinical environments.

**References:**


Disclosure of Interest: None Declared

RT 04-2 – Using Simulation To Inform, Test And Implement Improved Clinical Handover

Patient safety and quality improvement
Submission ID: IPSSW2017-1136

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Context: The use of simulation to improve healthcare and patient safety has grown immensely over the past few years. While simulation is regularly used for a broad range of education and training, it can also be used to evaluate new patient safety initiatives such as checklists.

A quality improvement project was undertaken in a paediatric tertiary referral hospital to evaluate the effectiveness of the handover process of a critically ill or injured child from the emergency department (ED) to the children’s intensive care unit (CICU). There is extensive literature regarding the significant benefit of effective Clinical Handover on patient safety and patient care. Simulation was utilized to both test the approach and accompanying checklist and to educate clinicians to the new standardized approach.

Description: Staff surveys and focus groups were conducted to identify the barriers and levers of the clinical handover process. Using this data, a standardised patient transfer process incorporating the ISBAR principles was developed. The finalized format included a guideline and a checklist.

The process and checklist was then tested in a simulated environment by the project team. Further refinement of the guideline and tool post simulation was enabled through video review and reflection of the simulation.

The simulated scenario video was then edited and utilised to educate an identified small group of clinicians from ED and CICU on the new guideline and checklist. Following this a larger scale insitu simulation was conducted with this group in the ED with subsequent transfer to CICU. The simulation was filmed for data gathering and educational purposes. Feedback on the guideline and checklist following the simulation was collected from participants and edits made accordingly prior to implementation of the guideline and checklist.

The insitu simulation video was edited to create a more comprehensive educational tool to support implementation.

Evaluation: An audit tool was developed to evaluate the handover process prior to and post implementation. Data to date has shown a measurable improvement in a number of areas of clinical handover of critically ill or injured children to CICU.

Discussion: Utilising simulation to inform and test the guideline and checklist has proven extremely beneficial in developing a useful resource. The initial simulation enabled the project members to apply to practice the “words on the page”. The opportunity to evaluate and refine the checklist in simulation settings has enabled a smooth roll out of an appropriate tool that meets the project aim of improving patient safety in the clinical handover process. Utilising the video to facilitate implementation along with re-enforcement of the use of the checklist in regular simulated scenarios has led to greater uptake and subsequently improved clinical handover and patient care.
References:


Disclosure of Interest: None Declared

RT 04-3 – Opening The Doors: Utilization Of Simulation For System-Based Design Tests In Opening New Facility
Patient safety and quality improvement
Submission ID: IPSSW2017-1079

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Context: Simulation-based clinical systems test (SbCST) is a methodology to identify potential Latent Safety Threats (LSTs) related to resources, systems facility/space design and performance gaps. (1). In the opening of a new healthcare environment, simulation can be utilized to test new spaces at three times: pre-construction, mid-construction and post-construction. For this simulation the goal was to identify LSTs within physical layout, frontline operations and emergency system responses prior to the opening of a new outpatient building post-construction.

Description: A needs assessment process known as Change Management was completed to prioritize testing concerns. The goal of this type of brainstorming exercise is to identify priority clinical patient care areas and patient care situations for simulation based training and testing needs for the opening of the new outpatient areas. From this needs assessment, changes with the highest risk and highest impact were synthesized and included as simulation testing priorities. 11 in-situ simulation scenarios were designed and tested in the outpatient areas. A 3-day testing period ensued with a total of 149 personnel participating. Each participant completed a pre and post survey. Scripted debrief was utilized to probe at systems based questions and identify latent safety threats (LSTs) with both scenario participants, observers and Simulation team.

Observation/Evaluation: We Identified 33 potential LSTs utilizing SbCST. The LSTs were divided into categories: 7 clinical performance, 7 resource issues, 9 process issues and 10 facility/space issues. We were able to identify 5 themes, with 14 “quick hit” interventions addressed pre-opening. All 33 potential LSTs were addressed within the first 30 days of opening. Also of note participant confidence improved the most pre and post simulations in knowing where emergency supplies/equipment were located; processes to follow for patient care emergencies and increased confidence to care for a patient in the outpatient building. Simulation based systems testing proved a valuable tool in the identification of LSTs prior to the opening of the TCH Woodlands Outpatient Building. In the future, similar testing will be continued throughout the Woodlands Inpatient campus on a larger scale.


Disclosure of Interest: None Declared

RT 04-4 – Aligning Expectations: Innovative Simulation To Bridge Gaps In Communication During Informed Consent
Patient safety and quality improvement
Submission ID: IPSSW2017-1075
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Discussants: Adena Cohen-Bearak, M.Ed., MPH; Lauren Mednick, PhD; Sigall Bell, MD; Pamela Varrin, PhD; Lisa Burgess; Craig Lillehei, MD; Elaine Meyer, RN, PhD

Background: While pediatric surgical specialists often feel that they do an excellent job delivering informed consent information, parents sometimes feel differently. Our qualitative research with parents of recent surgical patients shows that the emotional nature of these encounters often prevents parents from absorbing important information imparted by the surgeon, leaving the parents with important knowledge gaps about the surgery itself, the aftercare, and the potential for issues during the recovery process. In addition, surgeons often fail to identify a go-to team member for parents to call upon, and often miss opportunities to attend to important social and emotional issues experienced by families.

Educational Goal: Pediatric surgical specialists and other surgical staff, when talking to families about upcoming surgeries, will be more prepared to: 1) customize their communication based on the needs of each family; 2) align their expectations with that of the family; 3) share clinical uncertainty; 4) recognize and attend to emotions; and 5) clearly identify team members to families.

Proposed Approach to Addressing the Question or Goal: We developed a unique educational workshop using simulated improvisational enactments with professional actors to train pediatric surgical specialists and other surgical staff to bring both surgeon and family expectations into alignment prior to surgery. This work builds on the pedagogy of the successful Program to Enhance Relational and Communication Skills (PERCS), and on a collaborative learning model involving interprofessional clinicians and families.

Conundrum or Difficulty Encountered: We piloted our newly-developed 2-hour workshop with surgeons and nurse practitioners in the departments of General Surgery, Neurosurgery, and Urology at Boston Children's Hospital, reaching 30 physicians and 5 nurse practitioners to date. Post-workshop evaluations have been overwhelmingly positive, and recordings of both pre- and post-intervention (workshop) conversations between and surgeons and parents are being analyzed for change, yet we are uncertain whether this is the most effective way to change surgical culture. We will explore challenges and approaches to encourage surgeons to embrace new communication and relational skills.

Questions for Discussion:
- Can training workshops utilizing simulated enactments effectively improve the way surgeons communicate with families prior to surgery, to improve the process of informed consent?
- How much training is necessary to change surgical culture and practice? What other supports must be in place to enable these changes to take root and be sustained?
- What is the best way to measure educational success?

Disclosure of Interest: None Declared

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Background: Simulation is frequently used to enhance education clinical skills and teamwork/communication. However, there are many potential barriers to implementing a simulation program and optimizing the benefits to
participants, service and ultimately patients is essential for success. In-situ simulation has an additional benefit of identifying potential risks to the patient in the actual clinical environment. For this to be successful, simulation programs must link with existing leadership and quality and safety systems. We describe a methodology for latent threat identification and reporting that is designed to improve patient outcomes and enhance the continued development of a simulation program.

Methods: The NICU in-situ simulation program has been running for over 5y (Oct 2011-Dec 2016). It involves high fidelity 4h workshops containing principles of crisis resource management (CRM) and simulated scenarios with facilitated debriefing. The participants at each workshop consist of a full neonatal team of Neonatologist, Charge Nurse, Nurse Specialist, Neonatal Fellow, Registrar and Registered Nurses. The faculty is similar, with the addition of Nurse Educators, Simulation Technician and medical or nursing guest debriefer from an external department. Participants give written feedback at the end of the workshop. The faculty identify latent threats during the simulated scenarios and classify these as educational gaps/departmental issues/organizational issues. Patient safety latent threats are escalated to the wider organization via incident reporting system and the NICU Director and Nurse Manager receive a report containing participant feedback, latent threats identified and proposed solutions.

Results: To date we have held 27 high fidelity CRM workshops with over 220 participants. Participant feedback is hugely positive and the majority of participants report finding the scenarios very useful with repeated requests for more frequent in-situ simulation. We identified a total of 54 latent threats, some occurred multiple times. Most (57%) were departmental, 39% educational and 4% organizational. Common threats relate to lack of role clarity, lack of arrhythmia recognition (VT/PEA) and handover communication. Multiple successful changes have been implemented including introduction of resuscitation team roles, arrhythmia teaching, SBAR for handover communication and standardization of NICU resuscitation trolleys. Addition of CRM feedback as a standing item on the department Quality and Safety meeting decreased time from identification of latent threat to implementation of proposed solution. Many proposed solutions involve the use of simulation for education and ‘putting-it-into-practice’ and this has led to an increase in frequency of non-CRM simulation sessions from monthly to fortnightly and the addition of task focused simulations.

Questions for discussion

- Suggestions to speed up process of implementing change?
- What latent threats are we still missing?

Disclosure of Interest: None Declared

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RT 04-6 – Safety II And Simulation: Overcoming Barriers To Implementation

*Patient safety and quality improvement*

Submission ID: IPSSW2017-1140

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Context: Efforts to improve patient safety blossomed following the IOM report “To Err is Human”, but evidence demonstrating actual improvement in safety has been mixed. The Safety II approach offers a perspective that may facilitate more effective improvement strategies. Many programs look only at “what goes wrong,”, a Safety I approach, focused on counting adverse events and responding in a reactive manner with additional rules and requirements. Safety II is an alternative approach that addresses the value in understanding “what goes right.” “What goes right” is related to “Work as Done,” which is work – such as patient care – as it actually happens, in real life, with real patients. Work as Done is often different from Work as Imagined, which is an idealized version of how healthcare delivery occurs. But conditions and systems in healthcare are not often ideal. Healthcare providers successfully provide safe care most of the time, despite treating complex patients, in systems that are not always designed for, and do not always function, in a manner that optimizes the healthcare provider’s efforts and thus the patient’s outcome.
A principle of Safety II is that the study of care that goes right is valuable. Understanding how individual adaptation improves care and how system conditions affect care is critical. Improving frequent and routine activities may have a greater positive impact than attempting to prevent the recurrence of an undesirable rare outcome. Simulation can elucidate how providers accomplish safe care in a complex environment. Work as Simulated provides opportunities to observe and debrief everyday work as well as work during crises, to provide insight into the constraints, supports, and competing priorities that impact healthcare providers’ abilities to adapt to changing demands. Proposed improvements can be studied in subsequent simulations, to evaluate their effectiveness and identify unintended consequences, creating a virtuous cycle of improvement.

Description: Mechanisms to report and act on potential improvements identified during simulations are not well established. Survey respondents report that latent safety threats which had been identified in simulation but not rectified have reached actual patients and represent important missed opportunities. We propose to explore mechanisms to capture and communicate system-level findings and insights by using or modifying processes already in place in many organizations. Discussion will explore how the Root Cause Analysis (RCA) process can be complemented by a Good Cause Analysis process and the Failure Modes Effect Analysis (FMEA) process can be complemented by a Success Modes Effect Analysis. Discussion will also explore advantages and barriers to formally and routinely entering information with system implications, derived from simulations, into the official safety event reporting system of the organization or the Patient Safety Organization (PSO).

References:

Disclosure of Interest: E. Deutsch: None Declared, M. Patterson Consulting of: Occasional consulting for SimHealth Group

PO 01-1 - Critical Events Training Program Base On In-Situ Simulation, Experience In A Cardiovascular Unit
Crisis Resource Management/Human factors and Teamwork
Submission ID: IPSSW2017-1259

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Abstract Body: The training of the health care team with educational strategies base on simulation is an increasing modality. However, performing the training in the simulation centers requires the health care team
to leave their work area for some time, with the difficulties that this situation implies, as the discontinuity of the care activities. The in-situ simulation training, using the unit’s real resources and the unit’s real health care team, is an interesting proposal to practice the competencies that involves the crisis resource management, and it is a feasible simulation format in our institution.

**Objectives:** To describe the implementation of a critical events training program base on in-situ simulation in a Cardiovascular Intensive Care Unit.

**Population:** Garrahan Hospital’s Cardiovascular Intensive Care Unit health care team.

**Design:** Descriptive.

**Site:** Garrahan Hospital’s Cardiovascular Intensive Care Unit (CICU).

**Results:** High fidelity scenarios were designed based on cases of cardiovascular postoperative patients. During each session an introduction to the simulation was developed, then a clinical high fidelity scenario took place in the CICU (i.e.: Cardiac tamponade, pulmonary hypertension crisis, JET tachyarrhythmia with hemodynamic compromise, and cardiac arrest), followed with a structure and confidential debriefing in a safe environment, in order to consolidate specific learning competencies. Satisfaction and confidence were measured before and after the simulation using Likert-type surveys. The results are expressed in absolute and percentage value.

Four sessions were carried out, where 26 staff professionals participated, 8 physicians and 18 nurses. We’ve analyzed 24 satisfaction surveys and 25 confident surveys. All the participants agreed that the case scenarios were relevant, meet their expectations, and helped to improve the teamwork. Prior to the course, 12% showed low confidence to solve a critical event, however at the end of the course the 100% of the participants expressed confident or very confident ($p = 0.001$).

**Conclusions:** The Critical events training program base on in-situ simulation was well accepted between the participants, and they show a high level of satisfaction. The possibility to train the health care team in a safe and confidential environment, without risks for the patients, makes the in-situ simulation an alternative to reflect on the professional performance of the health care team and to improve the patients’ care quality.


**Disclosure of Interest:** None Declared
Research Question: Can a two-day simulation TTT course focused on the Emergency Triage Assessment and Treatment (ETAT) curriculum lead to improved knowledge and participant perceptions of relevance related to the use of simulation in courses such as ETAT?

Method: A single group pre/post-test design was used to investigate the research question. The independent variable was the two-day TTT course using the ETAT content as a platform for learning. Key concepts in the course included adult experiential learning, scenario design, teaching skills, pre-brief and effective feedback. The primary dependent variable was participant learning, measured by performance on the pre- and post-course knowledge tests. Secondary dependent variables were participants’ post-course evaluations, which examined their satisfaction with course organization, teaching methods, learning, attitudes and relevance using 4-point Likert scales.

Results: A paired-samples t-test was conducted to compare pre- and post-test scores. There was a significant improvement in participants’ scores from pre-test (M=6.08, SD=1.97) to post-test (M=8.08, SD=0.99); t(12)=3.12 , p = 0.0007. These results suggest that the two-day TTT course was effective in increasing participant knowledge related to integrating SBL in ETAT in Malawi. Results of participant evaluations indicate high levels of satisfaction across all aspects of the TTT course (M= 3.89, SD=0.25). Range of agreement varied from 3.67 (0.49) for suitability of venue to 4.00 (0.00) for teaching aids and effective teaching methods.

Discussion/Conclusion: The curriculum grounding the TTT course was effective in enhancing health care worker knowledge of SBL within ETAT curricula in Malawi. Two days was sufficient for improving participant’s knowledge base, however many participants expressed interest in having more time for hands on application of concepts and would like to see the course delivered over a longer period of time. Future work will focus on assessing application of knowledge and delivery of SBL during future ETAT courses.

References:

Disclosure of Interest: None Declared

PO 01-3 - Expanding Team Simulation Through Enhanced Performance Evaluation, Feedback, And Skills Practice

Assessment (including use and validation of measurement and assessment tools)
Submission ID: IPSSW2017-1169

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Abstract Body: The rotational model of simulation (1) was introduced to address resource constraints in delivering high fidelity simulation. After using this model with several cohorts of learners, the model was evaluated using a mixed methods study to evaluate the value of the various components and help guide modifications to enhance the process (2). The results of this study were used to enhance evaluation tools, make improvements to the skills training portion of the model, and provide better feedback to learners. Following these changes a subsequent mixed methods study was performed to evaluate the impact.

Description: In the simulation, the learner teams rotate through four stations: Simulation Scenario, Self-Reflection, Skills Station, and Scenario Observation. Faculty and the simulation team conducted a mixed methods study to evaluate the perceived absolute and relative value of the various components of the rotational model. The mixed methods approach included online surveys, focus groups, and debriefs. The course faculty
and simulation team reviewed the results and discussed a plan for improvement to address learners’ feedback. As a result, an improvement process was put into play. Course faculty adjusted the skills station to add more time, expand the set of skills to practice, and focus on specific objectives that directly aligned with the scenario station. Also, learner teams are given immediate performance data which are completed by observing faculty. As a result, we streamlined the evaluation tools to align with course and scenario objectives. Finally, the observation, self-reflection and faculty checklist were all aligned to assess certain skills across the three tools, which provides an opportunity for validation and reliability.

Observation/Evaluation: Survey data showed that learner attitudes toward the program changes were positive. Learners appreciate the additional time for skills practice as well as the timely, written feedback provided to them by faculty. Learners appreciated the abbreviated survey tools, and faculty felt that the data more accurately reflected learner performance. Focus group questions addressed ways to continue to improve feedback, and how to focus learner time in the skills station to increase efficiency.

Discussion: The implementation of improved evaluations, immediate feedback, and skills training was well received by learners and positively evaluated by faculty. Additionally, it is clear that the rotational model is enhanced by the modifications made. Minor modifications will be made for 2017-18 following this latest survey and focus group, which will then allow further reflection on the process. Program leadership are confident that this latest round of improvements will aid in the ability to expand use of pediatric simulation in the curriculum.

References:

Disclosure of Interest: None Declared

PO 01-4 - Objective Structured Clinical Examination (OSCE) In Pediatric Intensive Care Fellows.
Assessment (Including use and validation of measurement and assessment tools)
Submission ID: IPSSW2017-1233

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¹Simulation Center, ²PICU, Garrahan Hospital, ³PICU, Austral’s University Hospital, ⁴PICU, Posadas’ Hospital, ⁵PICU, San Justo’s Children's Hospital, ⁶PICU, Güemes’ Sanatorium, ⁷Research and Education, Garrahan Hospital, Pedro Elizalde Hospital⁸, Buenos Aires, Argentina

Abstract Body: The final objective of training in Pediatric Intensive Care is the acquisition of the specialty’s skills. The OSCE is an important evaluation tool in the field of pediatric residences; it involves a particular logistic and organization challenge for the specialists who design it. There is no information about its implementation in the training of Pediatric Intensive Care (PIC) fellows in our country until today.

Objective: To describe the viability of the OSCE as a formative evaluation, and the satisfaction of the PIC’s fellows who participated on it.

Population: 1st and 2nd year PIC’s fellows, from: "Prof. Dr. Juan P. Garrahan" Children’s Hospital; Posadas’ Hospital, "Pedro de Elizalde" Children's Hospital; San Justo’s Children's Hospital; Austral’s University Hospital; Clinics’ Hospital; Güemes’ Sanatorium. Buenos Aires, Argentina.

Design: Descriptive.
Site: CeSim Garrahan. On May 2016 two OSCEs took place where 40 PIC’s fellows participated (1st year (50%) and 2nd year (50%)) from 6 different institutions. Nine stations for the first year fellows’ OSCE and 8 stations for the second year fellows’ OSCE were designed, and an approval criterion was defined for each station and each OSCE as a whole. A survey of satisfaction was conducted at the end of each OSCE.

Results: A total of 65% (13/20) of 1st year fellows approved the OSCE, and 80% (16/20) of 2nd year fellows. With a total approval score ≥ 60%, the median obtained: 1st year fellows’ OSCE was 60% (IQR 49%), 2nd year fellows’ OSCE was 78% (IQR: 31%). From the 1st year fellows’ OSCE, the “Brain Death Communication” station showed the highest score (82%), and the “Arrhythmias” station the lowest (17%); from the 2nd year OSCE the “Metabolic Disorders” station showed the highest score (81%) and the “Traumatic Brain Injury” station the lowest score (64%). At the end of the OSCE 96% of the students considered that the topics and the time allocated to each station were adequate. 100% of the fellows responded that the situations presented during the OSCEs, and the degree of the complexity were adequate; 63% of the fellows considered the presence of an observer teacher to be “unpleasant”. At the end of the OSCE 91.3% of the fellows said that it was very useful, 95.7% said that the feedback was very useful, 100% rated the OSCE positively and considered that this kind of methodology allowed them to identify the weaknesses in their training.

Conclusions: The OSCE is an evaluation methodology applicable to the physicians who are training in pediatric intensive care in our country. Its formative (non-summative) nature is well accepted by most of the participants. The OSCE emphasizes on the evaluation of the teaching-learning process, and the identification of its improvement aspects.

References:

Disclosure of Interest: None Declared

PO 01.5 - Longitudinal Performance Assessment Of A Cohort Of Anesthesia Resident Trainees
Assessment (including use and validation of measurement and assessment tools)
Submission ID: IPSSW2017-1093

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Abstract Body: Obtaining valid resident performance measures over time is critical to both patient safety and a comprehensive learning system. Earlier Harvard Assessment of Anesthesia Resident Performance (HARP) assessment work found it was feasible to assess resident performance on domains felt to be critical to safe independent practice with high reliability and initial evidence of validity. Little is known about the development of performance of anesthesiology residents from the 1st to 3rd year of training; the HARP assessment was used to characterize longitudinal performance of a group of residents in their 1st and 3rd year of training.

Methods: 20 residents independently engaged 4 scenarios designed for 1st year residents. 20 Trained anesthesiologists rated videos using the HARP rubric comprised 5 domains: 1) Synthesizes information to formulate a clear anesthetic plan, 2) Implements a plan based on changing conditions, 3) Demonstrates effective interpersonal and communication skills, 4) Identifies ways to improve performance, 5) Recognizes own limits. 10% of scenarios were rated twice for determination of inter-rater reliability. Scenario score is the average of 5 domain ratings, domain score was the average of those domain ratings across 4 scenarios and total score
was the average of all scenario scores. Descriptive statistics were used to summarize performance and provide evidence to support validity. Differences in performance by training year were analyzed using RM-ANOVA.

Results: Inter-rater reliability was 0.76. Over the 2 years, residents improved their performance by about 1/3 of a standard deviation. They improved most on scenario 3 (difference=0.9 points, ES=0.78) and did not improve on scenario 2 (difference=-0.2, ES=0.11). 12 residents had higher total scores; 8 had lower total scores. RM-ANOVA yielded a significant time effect (F1,73=5.8, p<0.025; ES=0.33). 1st year average total score was 4.4 and 3rd year was 4.8. 4 of 5 domain scores were significantly higher in the 3rd year. Domain 4 (Improve performance) was not significantly higher. Table 1 provides data on the differences in domain scores by training level.

Conclusions: The HARP assessment had good rater agreement and further evidence of validity as residents’ overall performance improved over the 2 years of training. Over the 2 years, residents improved their performance by about 1/3 of a standard deviation. They improved most on scenario 3 (difference=0.9 points, ES=0.78) and did not improve on scenario 2 (difference=-0.2, ES=0.11). 12 residents had higher total scores; 8 had lower total scores. RM-ANOVA yielded a significant time effect (F1,73=5.8, p<0.025; ES=0.33). 1st year average total score was 4.4 and 3rd year was 4.8. 4 of 5 domain scores were significantly higher in the 3rd year. Domain 4 (Improve performance) was not significantly higher. Table 1 provides data on the differences in domain scores by training level.

Image:

Table 1. Domain Scores by Training Level

<table>
<thead>
<tr>
<th>Domain</th>
<th>3rd Year</th>
<th>1st Year</th>
<th>Difference (3rd - 1st Year)</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthesizes information to formulate a clear anesthetic plan</td>
<td>4.72</td>
<td>0.73</td>
<td>4.50</td>
<td>0.80</td>
</tr>
<tr>
<td>Implements a plan based on changing conditions</td>
<td>4.74</td>
<td>0.75</td>
<td>4.43</td>
<td>0.88</td>
</tr>
<tr>
<td>Interpersonal and communication skills</td>
<td>4.68</td>
<td>0.85</td>
<td>4.43</td>
<td>0.91</td>
</tr>
<tr>
<td>Identifies ways to improve performance</td>
<td>4.63</td>
<td>0.78</td>
<td>4.39</td>
<td>0.90</td>
</tr>
<tr>
<td>Recognizes own limits</td>
<td>4.60</td>
<td>0.84</td>
<td>4.35</td>
<td>1.02</td>
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<tr>
<td>Total</td>
<td>4.68</td>
<td>0.73</td>
<td>4.42</td>
<td>0.83</td>
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</table>

References:

Disclosure of Interest: None Declared

PO 01-6 – Outcome-Based Evaluation Of The Neonatal Nurse Practitioners’ Procedural Competencies Via Simulation
Assessment (including use and validation of measurement and assessment tools)
Submission ID: IPSSW2017-1091

Abstract Body: The main focus of the modern healthcare is to provide a safe patient care which depends on the providers’ competencies. To achieve this, various teaching modalities, based on the outcome-based educational model (OBE), are used. In the current study, we evaluated neonatal nurse practitioners’ clinical performances using simulation. Correlations were examined between self-reported learner confidence and higher Kirkpatrick levels.

Method: Twenty five neonatal nurse practitioners were scheduled to participate in a simulation session to validate their procedural clinical skills. The following skills were included: endotracheal intubation, laryngeal mask placement, umbilical artery cannulation, lumbar puncture, abdominal paracentesis, chest tube placement, intraosseous access, thoracentesis, and defibrillation. Seventeen participants consented for using their performance data in this research. The skills performance has been evaluated three times: once during simulation, and two more times via video recording analysis. Prior to simulation, all neonatal nurse practitioners completed an anonymous 360 degree survey in which they evaluated all nurse practitioners for competency in performing given procedural skills. We called the results of the assessment survey the “perceived competency,” a surrogate substitute for a real life competency measure.

Results: Collected data was analyzed with the use of SPSS statistical analysis package. Checklists validity was reviewed by experts in pediatrics, simulation and psychometrics, and determined to reflect on the standards of practice for given procedures. To determine the reliability of the instrument, checklists item analyses has been conducted and obtained results showed high internal consistency and reliability with Chronbach’s alfa of 0.577. There was high interrater reliability of the tests with no significant difference between live and video-based evaluations. The participants scored highest at LP and chest tube stations with the average score of 98%-99%, and lowest at the defibrillation station with the average score of 82%. Similar instrument analysis has been performed on the survey that measured the “perceived” procedural competencies which showed similar results. The correlation analysis has shown no significant correlation between “perceived competence” and the results of the simulation-based clinical skills assessment.

Conclusion: We have created and validated a Kirkpatrick level four tool for assessing neonatal nurse practitioner’s procedural competencies. Data showed a lack of correlation between self-assessment of the competency to perform certain clinical skills, subjective peer-to-peer and objective simulation based skills evaluation. These findings emphasize the importance of performing objective structured clinical skills validation as a measure of the providers’ clinical proficiency rather than relying on the results of self-reported confidence levels and training satisfaction.

References:
2. William McGaghie et al, Effect of practice on standardized learning outcomes in simulation-based medical education, Medical Education 2006; 40:792-797

Disclosure of Interest: None Declared

PO 01-7 - How Effective Are Practitioners At Dealing With Distraction During Newborn Resuscitation?
Submission ID: IPSSW2017-L5-14

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**Background** – Effective basic airway management and mask ventilation are paramount when resuscitating newborn infants. These skills are usually assessed in protected classroom environments, without the distraction of the clinical setting. There is a paucity of evidence on the effect of distraction on a practitioner’s ability to perform effective mask ventilation during newborn resuscitation.

**Research Question** – What is the effect of distraction on mask leak, inspiratory and expiratory time and ventilatory rate when practitioners perform basic mask ventilation on a term and preterm manikin?

**Methodology** – Thirty medical and nursing staff, of differing paediatric and neonatal experiences, undertook mask ventilation on modified term and preterm manikins, using a T-piece (Neopuff®) device with an appropriately sized mask. Participants were given a clinical scenario before the test and asked to perform continuous ventilation breaths as per Newborn Life Support guidelines. After 30 seconds, each participant was asked five standardised questions relating to the scenario, akin to real-life questions posed in the clinical setting, whilst they continued to provide ventilation breaths. The mask leak, inspiratory (Ti) and expiratory (Te) time and ventilatory rate, before and during distraction, were calculated using SMART® flow sensor. Fifteen seconds of continuous ventilation breaths were analysed from both epochs. A 2-sample t-test was used to compare data before and during distraction for each participant. A subgroup analysis was performed dependent on the level of experience and participants’ professional backgrounds. Significance was assessed at the 95% confidence level (p≤0.05).

**Results** – 2 consultants, 3 middle grade doctors, 5 tier one doctors, 5 advanced nurse practitioners, 5 senior sisters, 5 junior sisters and 5 staff nurses participated. When participants were analysed together, in the term infant (287 breaths analysed), there is a significant difference in mask leak (11.3% versus 18.9%, p<0.001), shortened Ti (0.77s versus 0.71s, p<0.001) and increased in frequency of delivered breaths (39.8 versus 42.0 breaths/min; p=0.01) when distracted. In the preterm infant (291 breaths analysed), Ti is significantly shortened (0.79s versus 0.72s, p<0.001), ventilation rate increased (40.7 versus 42.7 breaths/min, p=0.03) and shortening of the inspiratory: expiratory time ratio, commonly reversed when junior nurses were distracted.

**Conclusion** – Even in a semi-controlled environment, distraction has a significant effect on a practitioner’s ability to mask ventilate. Increasing practitioner’s insight into their personal effects of distraction in a simulated environment may bring about improved techniques for dealing with real-life scenarios.

**References**
**Description:** We have adopted a server-hosted relational database design using the FileMaker™ platform. The system allows us to author, edit and categorize simulation cases via a web browser interface. Simulation cases are linked to learning objectives, competencies and resource materials via simple layouts. Apple iPads are used by facilitators to run and rate the simulations. Resource materials such as lab-values, x-rays and patient pictures is available on the iPads and displayed to the participant. The system also generates pdf packages of the simulation, resource materials and rating tool. The rating tool utilized is the Global Rating Scale for Paramedics which ensures that meaningful data is collected and studied (1). The simulations can be run and rated without internet connectivity. A synchronization functionality updates the simulation cases to the latest versions and uploads the completed ratings to the server.

**Observation/Evaluation:** The feedback from users has been overwhelmingly positive. Facilitators are finding the system easy to use and have provided feedback to further enhance the system. Using a flexible platform like FileMaker™ has allowed us to make continuous improvements without major system redesigns. We are only now beginning to realize the power of having instant availability of rating results. Determining if candidates were successful from a multi-simulation certification event seconds after the completion of the event is unprecedented. We can also gain insights on how performance varies from base to base, by years of experience, by level of care, or any other factor we choose. We are able to easily see how a given simulation case is performing, if there are common issues that the participants are struggling with and if learning objectives are being met.

**Discussion:** The solution that we have developed has been very successful but has required significant resources to develop and maintain. Even though the FileMaker™ platform is easy to use it requires some specialized knowledge to ensure the system is robust and secure. Having managerial support for the project is imperative to ensure the correct resources are made available.

**Image:**


**Disclosure of Interest:** None Declared
PO 02-1 - Development Of Torso/Spine Simulant For Interventional Procedures

Simulation technology (including novel adaptations of current mannequins, technology, and hardware and/or software, or the development of new hardware or software for simulation-based education)

Submission ID: IPSSW2017-1118

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Abstract Body: Educating physicians in interventional procedures relies on relatively few simulants, or patients. In the pediatric population a comparative lack of simulants may force providers to revert to ‘see one, do one, teach one’ when it comes to congenital anomalies. Rare or unique anomalies would be unlikely to ever be available commercially. Therefore, the capability of producing high fidelity simulants is a potentially great benefit for pediatric simulation. Our project was to develop an accurate torso/spine simulant based on patient data.

Description: After IRB approval, CT imaging data was obtained from a Chronic Pain Clinic patient. The bony anatomy of the spine was identified, isolated and converted into a 3D model for printing using Mimics Software (Materialize, Belgium). Since current imaging practice limits the data to fields smaller than the entire torso, a volunteer was scanned to provide a torso model using a Sense 3D scanner (cubify.com). The torso anatomy was isolated and broken into several smaller pieces to allow printing within the volume of the available 3D printer (Felix 3.0, felixprinters.com). These pieces were then joined and sealed. A mold of the torso was made using silicone rubber (Rebound-25, smooth-on.com) supported by a rigid shell (Plasti-Paste II, smooth-on.com).
To hold the spine in an appropriate location within the torso a rigid support was developed based on a 3/4” conduit. Components were designed in OpenSCAD (openscad.org) and 3D printed. The components were mounted and secured using M5 bolts nuts & washer.

The soft tissue of the torso was supplied by casting Flex Foam-It 7FR (smooth-on.com) into the torso with the spine & support. For even foam distribution, a plywood shell was placed over the opening as the foam was expanding. After the foam had cured completely, the wooden shell and rigid support were removed. This left the 3D printed spine embedded within the torso foam. The torso simulant as then removed from the mold.

Observation/Evaluation: A complete torso model was able to be developed. Imaging was obtained using fluoroscopy, which demonstrated high imaging fidelity (image 1). Evaluation of the simulant shows more resistance to compression than most human tissue, but it was felt to be within an acceptable range. Resistance to needle passage was variable, but within the range of human tissues.

Discussion: A complete interventional torso/lumbar spine model was created with high fidelity for less than $400 USD. While using an adult data source, these techniques may be reproduced in any patient size/age if data is available. Further development will include improvements to the design/process to simplify production, increase accuracy, and optimize the properties of the torso.
Extrapolating this model to a pediatric population will increase simulation for difficult or unique anatomy, allowing for reduced ionizing radiation exposure and potentially lower risk of complications.

Image:
Disclosure of Interest: None Declared

PO 02-3 - Analysis Of Soft Tissue Materials For Simulation Development

Simulation technology (including novel adaptations of current mannequins, technology, and hardware and/or software, or the development of new hardware or software for simulation-based education)

Submission ID: IPSSW2017-1109

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Abstract Body: Creation of custom or ‘ad hoc’ simulants is a common method to meet unique simulation needs as well as stretching available budgets. Pediatric simulation in particular faces a low availability of simulants, such as for congenital anomalies. 3D printing is a potential tool for creation of these simulants. However, limitations of 3D printing materials (being generally rigid) calls for combining these techniques with other techniques such as casting and molding. The material properties of 3D printed objects were studied previously (1), and this project was developed to examine the properties of available casting materials.

Description: Samples for commercial silicone and urethane materials were evaluated for texture or ‘feel’ to be comparable to human tissues. The most ‘human’ materials and similar compounds (based on durometer and expansion for foams) were purchased and cast in uniform shapes. Gelatin was also cast in double and triple strength formulations as well as ‘ballistic’ gel formulation for comparison. Forms were created for casting from acrylic sheet cut using a laser cutter. Form components were then assembled using either chemical welding or M3 screws/ nuts. For CT imaging, all materials were placed on a wooden (MDF) frame, separated by acrylic sheet squares. After CT imaging, material slices were imaged under ultrasound. Each slice was imaged with the ultrasound contrast at minimum, maximal, and then ‘auto’ contrast settings.

Observation/Evaluation: Properties of the silicone rubbers were fairly uniform via CT (Sample Image 1). Ultrasound imaging also revealed fairly similar properties, with some variation in depth measurements as well as internal appearance due to air bubbles, etc (Sample Image 2).
The CT imaging of the urethane foams revealed a significant lack of opacity. However, some foams were significantly more opaque than others (Sample Image 3). Penetration of US in the foams was significantly limited (Sample Image 4), not unexpected given the foam structure.

**Discussion:** Depending on the imaging and simulation needs, both silicone and urethane materials may be appropriate for use. The ‘feel’ of these materials still needs evaluation. Whether a material can be palpated, cut or pierced by a needle like human tissue will have a significant impact on their utility in simulation. However, at the moment, there is not a clear method to evaluate these properties. Combining this work with prior study of 3D printed materials begins to open the possibility of patient specific simulation. Teaching residents on patient specific simulators, or practicing for care of difficult patients based on prenatal imaging is coming closer to reality. Future work will include studying the ‘feel’ of materials, as well as the interaction of 3D printed materials and casting materials to help identify ‘optimal’ combinations for specific simulation goals.


**Disclosure of Interest:** None Declared

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**PO 02-4 - Pediatric Gunshot Wound And Collapsed Lung Simulator**

*Simulation technology (including novel adaptations of current mannequins, technology, and hardware and/or software, or the development of new hardware or software for simulation-based education)*

Submission ID: IPSSW2017-1193

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**Abstract Body:** According to a study entitled, "Hospitalizations Due to Firearm Injuries in Children and Adolescents", published in Pediatrics in 2014, "on average 20 US children and adolescents were hospitalized each day in 2009 due to firearm injuries." The simulator herein described was developed by SIMPeds at Boston Children’s Hospital (BCH) to provide a means for quickly diagnosing and treating an emergent pediatric patient suffering from a gunshot wound to the chest. The simulator enables needle chest decompression and chest tube placement with blood-loss sufficient to trigger rapid transfusion protocol. The simulator is designed to be compatible with the Laerdal SimJunior manikin. It is currently being used at BCH as part of a Trauma Critical Resources Management (CRM) course developed in conjunction with the Department of Emergency Medicine.

**Description:** The simulator is composed of a silicone chest designed to fit the SimJunior manikin, with replaceable/disposable chest tube and needle decompression modules. The chest overlay resembles an overweight Caucasian child 9 years of age and attaches to the manikin via a zipper. The needle decompression module is composed of a 2-inch 3D printed ribcage section (to allow for palpation of intercostal space) and back-plate; a silicone bladder affixed to the back plate; and length of silastic tubing. The unit is filled with blood or air in order to provide visible flash-back when pierced. A silicone skin layer provides seamless integration into the chest overlay and serves as a waterproof membrane to prevent blood from entering the manikin. The module is enclosed in a waterproof pocket. The chest tube module consists of a molded plastic section of rib cage (to allow for palpation of intercostal space); a plastic guide to direct the chest tube in the appropriate direction; a waterproof silicone membrane; a short length tubing; and a skin layer with matching outer surface contour to the overlay. The tubing is connected to a one liter blood supply. The chest tube module resides in a waterproof membrane to prevent the ingress of blood. Once pierced, frank bleeding is triggered.

**Observations:** During implementation (a high tempo, acute trauma scenario) it was observed that participant ‘buy-in’ was high. Upon frank bleeding, a confederate noticed a pronounced look of anxiety on the faces of the participants, which was later corroborated by the participants during debrief. Additionally, some errors in technique were observed.
**Discussion:** Factors such as the pace of the simulation, the quantity of blood, and the aesthetic realism of the trainer were designed to elicit, and succeeded in eliciting, the types of behaviors and errors likely to occur in real situations. Following the first implementation, a modification to the chest tube module was made to prevent the interior wall from being pierce by the trocar.

**Image:**

![Image](image-url)

**References:** Leventhal, JM, Gaither, JR, Sege, R. Hospitalizations Due to Firearm Injuries in Children and Adolescents. Pediatrics. 2014 Feb;133(2);219-255; DOI: 10.1542/peds.2013-1809

**Disclosure of Interest:** None Declared

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**PO 02-5 - Comparison Of Paediatric Physicians' And Surgeons' Technical Skills Using Medium Fidelity Simulation**

*Simulation technology (including novel adaptations of current mannequins, technology, and hardware and/or software, or the development of new hardware or software for simulation-based education)*

Submission ID: IPSSW2017-1127

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**Abstract Body:** Paediatrics is often regarded as a ‘soft’ specialty attracting those with curiosity, sensitivity and a sense of humour.1 The authors’ experience is that paediatrics is actually an extremely technical specialty requiring advanced practical skills.

**Research Question:** We sought to evaluate whether the technical skills of paediatric physicians differed to those of their paediatric surgical colleagues.

**Methodology:** We conducted a single centre, non-blinded, prospective cohort study in a tertiary paediatric hospital in Belfast, Northern Ireland. We used a commercially available, low cost simulator, ‘Cavity Sam’ from the board game Operation®. Participants were invited to extract all thirteen ‘funatomy organs’ from the platform within a clinical environment,[Figure 1] If the participant touched the edge of any body cavities the buzzer sounded and ‘Cavity Sam’s’ nose flashed red. Successful completion of the task was defined as the removal of all 13 organs. We compared the time taken to complete the task and the number of buzzes triggered between paediatric physicians and surgeons.
Results: There were 22 participants; 11 physicians and 11 surgeons. All participants completed the task. Physicians were significantly quicker than surgeons [median 105 seconds Vs 160 seconds, p<0.05]. There was no significant difference in the number of buzzes obtained. The primary researcher noted three comments that could be considered offensive on a paediatric ward. The study was conducted in a closed room and fortunately no patients were present. No other adverse incidents were noted. All participants declined the offer of a follow up appointment with the play therapist and the offer of a formal record of their score for inclusion in their portfolio for presentation at appraisal.

Discussion/Conclusions: Our cohort study is the first to compare technical skills between paediatric physicians and paediatric surgeons. It was demonstrated that Operation® can be used as a medium fidelity simulator to elicit differences in technical skills. Surgeons were more likely to blame the quality of the equipment or utter an expletive during the task. Physicians completed the task more quickly and with a similar accuracy to their surgical colleagues. Therefore if your child needs an elective ‘funnyboneectomy’ physicians and surgeons may be capable of performing the procedure equally accurately. However, in the emergency setting, when speed is of the essence, perhaps you need a physician. Further practical studies are recommended.

References:
http://careers.bmj.com/careers/advice/A career in ... paediatrics.

Disclosure of Interest: None Declared

PO 02-6 - Simulation Prepares An Inter Professional Team For Emergency Evacuation Of A 60 Bed Level #3 Nicu
Simulation for procedural and psychomotor skills
Submission ID: IPSSW2017-1150

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Abstract Body: The purpose of the simulation activity is to improve the knowledge and skills of the Neonatal Intensive Care staff during an evacuation of the unit. Improving the knowledge and skills will allow for the safe and efficient evacuation of patients and staff from the unit.

Background: In August of 2011 a 5.8 magnitude earthquake struck the Baltimore/Washington DC corridor. This event identified a critical requirement to prepare our inter-professional team to evacuate approximately 60 neonatal patients should an emergency arise. A needs assessment indicated 60% of staff had little or no knowledge of the unit’s evacuation plan and 55% of respondents were not aware of their specific role in an emergency evacuation. A simulated evacuation was designed and implemented in the Spring of 2015.

Methods: The NICU educators coordinated the design and implementation of the simulated evacuation activity, in collaboration with unit leadership, hospital emergency management team and unit practice and professional council. In order to encourage realism within the simulated activity, a prepared manikin was placed in patient rooms and assigned a varying level of acuity. The training session began with a pre-brief which included a
description of the evacuation plan, delineation of roles, responsibilities based on scope of practice, use of the evacuation equipment, and unit emergency bags. Several sessions were conducted and to date 60% of staff have experienced the simulated evacuation activity with the goal being 100%.

Outcome: Average evacuation time was 21 minutes from the 6th floor unit to the ground floor. Participants engaged in a debrief following each session during which the staff notably expressed an increased confidence with the evacuation plan, roles, and operation of the evacuation equipment. In addition, the debriefing allowed for identification of latent threats of staffing and equipment storage which the planning group used to streamline the evacuation process.

References:
5. *JOGNN*, 43, S86-S97, DOI: 10.1111/1552-6909.12321

Disclosure of Interest: None Declared

**PO 02-7 - Sim One, Do One, Teach One - Senior Resident-Led Pediatric Intern Procedural Skill Training**

**Simulation for procedural and psychomotor skills**

Submission ID: IPSSW2017-1158

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**Abstract Body:** Objective: To assess whether senior pediatric resident-led simulation-based procedural training (SBPT) for pediatric interns improves 1) intern procedural skill, confidence and knowledge and 2) senior resident procedural and teaching confidence.

**Introduction:** The Accreditation Council for Graduate Medical Education requires graduating pediatric resident competence in common pediatric procedures,¹ but graduating residents lack these skills.² Senior residents must also teach procedural skills to junior trainees. SBPT allows repetitive practice and has been shown to improve resident procedural skills.³⁴⁵

**Methods:** A needs assessment of pediatric residents and faculty at Rush University Children’s Hospital found gaps in pediatric residents’ procedural skills. A SBPT curriculum (lumbar puncture [LP], intravenous [IV], cardiac defibrillation [CD]) was developed and delivered to senior residents. Interns then received four, 2-hour, senior resident-led SBPT sessions over 2 months. Interns’ procedural skill performance was video-recorded and assessed by trained, blinded raters. Interns’ pre- and post- training skills, confidence and knowledge were compared. Seniors residents’ procedural knowledge and confidence performing and teaching the procedures were measured prior to post-training.

**Results:** Twenty-five senior residents underwent SBPT. Confidence performing LP and CD improved significantly (p=0.001; p=0.002 respectively). Confidence teaching procedures improved significantly (p=0.03; p=0.012; 0.00 for IV, LP and CD respectively). Nine interns completed SBPT. Interns’ IV placement, confidence performing LP, and procedural knowledge improved significantly (p=0.008; p=0.027; p=0.001 respectively). Interns significantly outperformed 2nd year residents (non-SBPT, table 1) in IV and CD skills (p=0.008; p=0.017 respectively) and procedural knowledge (p=0.03), even though 2nd year residents had performed significantly more pediatric IVs and LPs on actual patients (p=0.023; p=0.00 respectively).
Discussion: Senior pediatric resident-led SBPT significantly improved pediatric interns’ procedural skills, procedural knowledge and confidence, and enhanced senior residents’ confidence performing and teaching pediatric procedures. SBPT interns outperformed 2nd year residents despite 2nd year residents having more experience on actual pediatric patients. Senior pediatric resident-led SBPT is a feasible addition to pediatric procedural skill training and can easily be replicated using few, readily available resources.

<table>
<thead>
<tr>
<th>Interns vs Second Year Residents</th>
<th>Intern Mean (N)</th>
<th>Second Mean (N)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedural Knowledge</td>
<td>0.76 (9)</td>
<td>0.63 (11)</td>
<td>0.03</td>
</tr>
<tr>
<td>IV Skills</td>
<td>0.86 (8)</td>
<td>0.65 (6)</td>
<td>0.008</td>
</tr>
<tr>
<td>LP Skills</td>
<td>0.81 (8)</td>
<td>0.69 (5)</td>
<td>0.289</td>
</tr>
<tr>
<td>CD Skills</td>
<td>0.90 (7)</td>
<td>0.67 (9)</td>
<td>0.017</td>
</tr>
</tbody>
</table>

References:

Disclosure of Interest: None Declared

PO 03-1 - Validation Of Animal Models For Simulation Training In Paediatric Laryngotraheal Reconstruction

Simulation for procedural and psychomotor skills
Submission ID: IPSSW2017-1121

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Abstract Body: Paediatric Laryngotraheal stenosis is a complex and challenging condition to manage and surgery is often the primary treatment modality. Laryngotraheal reconstruction (LTR) is the commonest open airway augmentation procedure performed in children. Across the UK small numbers are encountered annually posing a challenge to training as well as maintenance of expert skills. A variety animal models have been used in LTR research to address technical questions. However there is a lack of validated simulation models for training open paediatric Laryngotraheal surgery. We have recently assessed the feasibility of 3 commercially available high fidelity ex-vivo animal models for use in simulation of LTR.

Research Question: What is the best validated ex-vivo animal model for performing and training paediatric Laryngotraheal reconstruction?

Methodology: The head and neck of three different animals (Lamb/Suckling Pig/ Rabbit) were obtained from abattoirs and fresh frozen. Seven Otolaryngology trainees and 5 paediatric otolaryngologists participated in performing LTR on each animal model. Prospective validation was performed using pre and post procedure survey. A 5-point likert scale was used to answer questions relating to face validity (realism of the models), content validity (subject matter, curriculum topics) and applicability to surgical training. Overall Impact on trainee confidence, knowledge and satisfaction
was observed. Expert’s opinion regarding use of models as a training as well as pre-operative planning tool was noted.

Results: This is a work in progress: expected completion in February 2017. Otolaryngology trainees included 4 with previous paediatric airway surgery experience and 3 with no experience at varying stages of training. Our expert cohort have a combined experience of over 200 LTR procedures. A total of 36 LTR procedure will be performed.

Main components of face validity includes size, appearance and tissue handling of the laryngeal cartilage and the grafting material.

Content validity focuses on the effectiveness of each model at simulating key steps in the LTR operation including the approach to the larynx, Laryngofissure, posterior cricoid split, graft contouring and placement and overall airway reconstruction technique. Comparisons were made to identify the most realistic and effective model.

Applicability and utility of the models as training tool and ability to address curriculum content was also addressed by experts and trainees and compared against standard teaching methods.

Discussion/Conclusions: This study demonstrates the validity of low cost ex-vivo animal simulation models for performing and training LTR and identifies which models are worth investing in. Preliminary data strongly supports face and content validation of all three models, in particular the Ovine models as a valuable tool in paediatric airway training and pre-operative surgical planning.

References:

Disclosure of Interest: None Declared

PO 03-2 - Simulation - In Situ Vs In Lab, What Do The Participants Think?

Process improvement and organizational change

Submission ID: IPSSW2017-1197

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Abstract Body: As simulation becomes more established its delivery has become potentially dicotomised between the normal clinical environment (in-situ) or via simulation laboratory. Clearly both have a role in education however there is little work on understanding participants perceptions towards them.

Method: We run a multidisciplinary simulation program using both in situ and in lab simulations for paediatric and adult Emergency Medicine (EM) scenarios. Both modalities use the same faculty and manikins of equivalent fidelity. We collected feedback from the participants using a standardised and anonymous questionnaire after their scenario.

Participants were asked how much they agreed/ disagreed with the following statements:
- I found the overall experience of the simulation session useful.
- The simulation was realistic.
- I will be less apprehensive of simulations in the future

Results: We ran 46 in situ simulations with 217 participants and 12 in lab simulations with 65 participants. 83.9% of participants in the In Situ simulations strongly agreed that the experience was useful, compared to 56.9% in the In Lab simulations.
57.6% strongly agreed that the In Situ Sim was realistic compared to 49.2% in the Lab. 52.9% of the In Situ participants strongly agreed that they would be less apprehensive of future sims, compared to 33.8% of the In Lab (Figure 1 + 2). Notably 4.6% of the In Situ responded with a disagree or strongly disagree to being less apprehensive, as opposed to 13.8% of the In Lab group.

**Discussion:** The overall positive results support that simulation is seen as worthwhile by the participants regardless of the setting. However In Situ simulations would seem to be perceived more favourably by the participants. Understanding this subtle difference may help facilitators and educators set the context and objectives for the simulations regardless of environment.

**Image:**

![Figure One: In Situ - Apprehension](image1)

![Figure Two: In Lab - Apprehension](image2)

**Disclosure of Interest:** None Declared

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**PO 03-3 - In Situ Simulation Leads to the Development of Simulation-Based Serious Event Reporting Tool**

*Process improvement and organizational change*

Submission ID: IPSSW2017-1117

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**Abstract Body:** In-Situ Simulation Leads to Development of Simulation-Based Serious Event Reporting Tool

**Authors:** Lisa Petras, BSN, RN, Sharon Lunetta, BSN, RN, Naomi Rent, RN, Mark Volk, MD, DMD, Christopher Roussin Ph.D. Main Operating Room and Pediatric Simulator Program, Boston Children’s Hospital, Boston, MA

**Methods:** This study involved multidisciplinary in-situ simulation team training performed in a busy pediatric operating room in order to improve teamwork and reduce errors. The participants consisted of native teams from the Anesthesia, Surgery and Nursing services. The surgeons were service specific and most of the Pediatric Surgical specialties participated. The anesthesia and nursing staff rotated through multiple services. Each simulation scenario was immediately followed by a formal debriefing session. Facilitator/debriefers were represented by the same three services. The debriefings consisted of in depth discussion of topics identified by participants and the observations of the facilitators.
Results: During the simulation debriefings we identified several problems/issues. These included concerns with equipment availability and malfunctions, Time Out discussions and emergency code button location. These issues have prompted positive structural and policy changes the OR. They also lead to customization of our current Serious Event Reporting (SERS) tool to allow reporting of concerning issues and events identified during Simulation. This provided a mechanism by which safety professionals within the institution may become aware and act quickly on simulated-related safety concerns.

Conclusion: The experience of in situ, multidisciplinary, native team simulations in our pediatric OR’s, our hospital has lead to the development of a simulation-based SERS reporting tool. This has allowed more direct communication of medical errors to QI/QA and clinical staff. The result has been faster, more effective remedies to safety concerns discovered during simulated events.

Disclosure of Interest: None Declared

PO 03-4- Improving Pediatric Acute Care Through Simulation (Impacts)

Process Improvement and organizational change
Submission ID: IPSSW2017-1200

Abby Basalely 1, Meghan Craven2, Erin Hanft1, Sandeep Gangadharan3, Dipti Mirchandani-Shah4
1Pediatrics, Cohen Children’s Medical Center, Northwell Health, 2Pediatrics, Cohen's Childrens Medical Center, Northwell Health, 3Pediatric Critical Care, Cohen Children's Medical Center, 4Pediatric Hospital Medicine, Cohen Children's Medical Center, Northwell Health, New Hyde Park, United States

Abstract Body: Cardiopulmonary resuscitation in hospitalized children is rare.(1) At CCMC, over the past two years, 13 floor codes were activated. The low incidence of high-risk events is a limitation for institutional readiness. A pre-survey distributed to nurses and resident physicians at our institution on the location and use of resuscitative equipment on pediatric floors showed that 73% knew the location of the code cart and 45% the location of the defibrillator. Only one provider reported performing compressions in their career. Despite PALS certification, 44% were uncomfortable assembling or performing BVM ventilation without supervision.

Research Question/Educational Goal: Simulation based training and acute care process improvement is often focused on critical care personnel.(2) Simulation training is typically conducted in off-site simulation centers with the use of high-fidelity simulation. This, despite being valuable as a pedagogical tool, still has substantial limitations. Our goal is to use weekly in situ low-fidelity simulation training centered on high-risk med-surg patients to improve situational awareness, knowledge of escalation triggers and competence in core resuscitation skills. Goals will be identification of the most at risk patient, recognition of early decompensation, initiation of early resuscitative measures, identification and use of resuscitation equipment and appropriate escalation to advanced personnel.

Proposed Approach: This multidisciplinary educational initiative was instituted weekly at a single tertiary care center on 3 pediatric units each with a diversified patient population. Pre-surveys were administered to participants, assessing technical and non-technical aspects of the care of decompensating patients. A low fidelity simulation was conducted and debriefed outside the room of the patient identified overnight to be at most risk of decompensation. The debrief focused on teamwork skills, assessment, first steps of management, location and use of equipment and escalation triggers.

Difficulties Encountered: Difficulties encountered included, lack of realism due to the use of low fidelity mannequins, uncontrolled environments with parents and uninvolved staff spectating and disruptions due to staff’s clinical duties. Our post-survey results demonstrated 100% knowledge of code cart and defibrillator location. Comfort assembling and performing BVM ventilation improved from 44% to 93%. It is unclear if these reports will translate to clinical situations. All but one parent surveyed viewed simulation positively; 80% felt more confident in their providers and 60% would like the option to observe the simulation in the future.
Questions for Discussion: What are the best metrics, other than binary and Likert scale, to measure success? How can the simulation develop into a reproducible scenarios with common themes and lessons? How can we create a clinical impact given the infrequent nature of these events?

References:

Disclosure of Interest: None Declared

PO 03-5 - Subgaleal Shunt Task Trainer: Development And Benchtop Testing
Simulation for procedural and psychomotor skills
Submission ID: IPSSW2017-1212

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Abstract Body: Hydrocephalus is the abnormal accumulation of cerebrospinal fluid (CSF) within the brain. The most common cause of hydrocephalus in premature babies is bleeding in the brain from an intraventricular hemorrhage (IVH). If severe, hydrocephalus can cause increased pressure inside the skull that can damage the brain if left untreated.

A temporarily treatment for hydrocephalus is to divert the CSF from the ventricles to the subgaleal space between the scalp and the skull where it can be absorbed. This is called a subgaleal shunt. The subgaleal shunt consists of a small tube placed into the ventricle and connected to another tube under the skin. The shunt also contains a reservoir that can be used to remove additional CSF if needed.

The procedure for removing CSF from the subgaleal shunt reservoir is complex, and if done incorrectly can damage the shunt, or cause infection in the brain. Therefore, training is essential to ensure that care providers can access the shunt safely. Currently, no subgaleal shunt task trainers are available on the market. We developed a subgaleal shunt trainer in order to allow our neonatal ICU (NICU) providers to practice the removal of CSF from a subgaleal shunt.

Description: We used a Premature Anne™ (Laerdal Medical, Inc.) as a base model to create an anatomically correct premature infant scalp and face. A cast was made of the Premature Anne’s™ head. The cast was then used to create a silicone mold which allowed us to make a thin silicone replica of the Premature Anne™ scalp and face. Plaster cast material was used to create anatomically correct skull of a correct size. A subgaleal shunt was placed between the skull and the scalp in the correct location. The ventricular drainage port of the subgaleal shunt was connected to a fluid chamber inside the skull that was filled with water to mimic CSF.

Observation/Evaluation: The subgaleal shunt trainer was tested in our simulation laboratory by two Neonatologists. The trainer had a realistic scalp and face (Figure). The subgaleal shunt was palpable under the silicone scalp, which mimicked real life. The CSF reservoir in the shunt was easily accessed with a shunt needle. Removal of simulated CSF from the reservoir was easily done. No leakage of simulated CSF through the silicone skin of the task trainer was noted after several punctures.

Discussion: We developed a subgaleal shunt task trainer so providers in our NCU could practice the removal of CSF from a subgaleal shunt. The shunt simulator worked well during bench-top testing. The next step is to conduct validity studies using in situ simulation exercises with providers from neonatology and neurosurgery. After validation, we will determine if the new trainer should be incorporated into standard hospital training in subgaleal shunt access, and/or competency assessment of our medical staff.
PO 03-6 - Extremely Premature Infant Intravenous Catheter Insertion Trainer: Development And Benchtop Testing
Simulation for procedural and psychomotor skills
Submission ID: IPSSW2017-1211

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Context: Intravenous (IV) catheter insertion is one of the most common procedures in pediatric medicine. The procedure is a core skill for pediatric nurses, and is also a required skill for pediatric residents according to the Accreditation Council for Graduate Medical Education (ACGME). In the neonatal intensive care unit (NICU) it is critical that healthcare providers are competent in IV insertion because extremely premature infants are dependent on IV fluids or parenteral nutrition until feeds are established. Therefore, training healthcare providers to place IVs in extremely premature infants is essential. Currently, however, very few extremely premature infant IV trainers are available on the market, and the available models are very expensive, costing several hundred US dollars. We developed a low cost IV trainer in order to allow providers in our NICU the ability to practice IV placement in extremely premature infants.

Description: We used a Premature Anne™ (Laerdal Medical, Inc.) as a base model to create an anatomically correct premature infant arm and hand. A cast was made of the Premature Anne’s™ arm and hand. The cast was then used to create a mold which allowed us to make a silicone-based replica of the Premature Anne™ arm and hand. Simulated veins were created by placing thin wires into the silicone mold. The wires were removed after the silicone dried, which left an open lumen in the silicone simulating a vein. Microbore IV tubing was inserted into the distal ends of the simulated veins in order to allow infusion of simulated blood and drainage of infused fluids and medications.

Observation/Evaluation: The IV trainer was tested in our simulation laboratory by a cohort of nurses. The trainer had a realistic size and shape of an extremely premature infant’s arm and hand (Figure 1). The veins were palpable under the silicone skin, which mimicked real life. The veins were easily accessed with a 24 gauge angiocatheter IV needle. A realistic flash of blood was noted when the IV catheter was correctly placed into the simulated vein. IV fluids were easily infused into the trainer and were drained through a drainage port. No leakage of simulated blood through the silicone skin of the task trainer was noted after several punctures.

Discussion: We developed an extremely premature infant IV catheter insertion trainer so providers in our NICU could practice IV placement in this vulnerable population. The IV trainer worked well during bench-top testing in the simulation lab. The next step is to conduct validity studies using the task trainer during in situ simulation exercises. After validation, we will determine if the new trainer should be incorporated into standard hospital IV training, and/or competency assessment of our neonatal healthcare providers.

Image:
Disclosure of Interest: None Declared

PO 03-7 - Orienting Residents To Pediatric Anesthesia Using In-Situ Simulation And Skills Training

*Simulation for procedural and psychomotor skills*

Submission ID: IPSSW2017-1114

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Abstract Body: Subspecialty rotations for anesthesia residents often have unique demands that make orienting to a given field challenging. Orienting residents to pediatric anesthesia is no exception. While orientations to subspecialty rotations in anesthesiology residency programs are not uncommon, many programs utilize electronic content (e.g. PowerPoint) that may hinder learning.² As an alternative to computer-based content, simulation programs are beneficial in teaching both technical- and non-technical skills to anesthesia residents; however, there is limited data exploring in-situ simulation as an orientation tool for residents beginning subspecialty rotations.²⁶ We describe the development and implementation of an immersive curriculum that combines procedural skills with high-fidelity simulation in a constructive-deconstructive format to orient residents to teach common intraoperative events that occur in pediatric anesthesia.

Description: Anesthesiology residents new to the pediatric anesthesia rotation participated in our orientation on the first day of their rotation. The orientation aimed to: (1) increase preparedness, (2) reduce anxiety by building perceived confidence early in the rotation, and (3) strengthen fund of knowledge. The 2-hour curriculum focused on common procedures (i.e. preparing for a case, managing an infant airway, intravenous placement, and caudal
anesthesia) and frequently encountered perioperative management issues (i.e. anxious parent interview, parent-present induction, and an airway emergency). We developed a comprehensive survey to assess the orientation’s efficacy. Fifteen essential elements to pediatric anesthesia were identified and scored on a 5-point Likert-scale with higher scores indicating perception of resident preparedness. The surveys were administered before and after the orientation, as well as 1-month subsequently.

**Observation:** Twenty-seven residents participated in the orientation with approximately equal number of males and females. Two surveys were excluded due to incomplete data collection. Cronbach’s alpha for the three time-points ranged from 0.90-0.93 indicating the items had strong internal consistency. Repeated measures ANOVA detected a positive linear trend, F(1,24)=108.12, p<0.001, η2=0.82. Pairwise comparisons using the Bonferroni technique revealed a statistically significant increase in confidence at each subsequent time-point.

**Discussion:** Subspecialty rotations often place anesthesia residents in potentially difficult and stressful situations. Orientation for such rotations may be a critical opportunity to improve resident experience and knowledge, as well as enhance patient care. We created an orientation using in-situ simulation and skills training to help prepare residents for their pediatric anesthesia rotation. Our data illustrates that such an approach may be useful in learning both technical skills and subject-specific content for a pediatric anesthesia subspecialty rotation.

**References:**
1. Bartsch RA, Cobern KM. Effectiveness of PowerPoint presentations in lectures. Comput Educ 2003;41:77-86

**Disclosure of Interest:** None Declared
for Appraisal (for Consultants and non-career grade anaesthetists who undertake occasional paediatric practice) and training for acute paediatric emergencies.

‘Managing Emergencies in Paediatric Anaesthesia for Consultants’ (MEPA FC) provides a comprehensive update in resuscitation of the sick child for those who undertake an occasional paediatric list or provide out of hours paediatric care. The course covers all aspects of paediatric codes recommended in the Royal College of Anaesthetists (RCoA) UK Level 2 matrix (2,4).

**Methods:** Simulation Leads from the tertiary unit and DGH worked closely together in the development and delivery of the course. Scenarios were adapted for local use. Scenarios were run ‘in-situ’ (Theatres/Intensive Care Unit) - allowing for ‘systems testing’ in addition to training.

**Results:** 3 MEPA FC courses were delivered. 12 Consultants and 2 non career grade doctors from the DGH attended. Faculty included tertiary unit paediatric anaesthetists/intensivists and a DGH anaesthetist with an interest in paediatric anaesthesia. 100% of participants “agreed” or “strongly agreed” that they had improved confidence in managing paediatric emergencies. Free-text comments stated that the scenarios were “relevant” and “realistic” delivered by “expert” and “approachable” trainers. 100% of participants thought the training would positively affect patient safety and 100% of participants would recommend the training to colleagues.

**Discussion:** Participant feedback suggested many factors behind the success of this training programme:
- MEPA FC aligns with RCoA appraisal requirements.
- Running MEPA FC in-situ allows realistic simulation and ‘systems testing’.
- Links between the tertiary unit and the DGH are strengthened by training together.

**Future Work:** Participants have expressed a desire that MEPA FC be incorporated into a regular revalidation cycle. The reflective component of the centralised feedback is used for evidence for Revalidation in addition to evidence of attendance. Outcomes from ‘systems testing’ will be presented at a future date.

**References:**
2. http://www.rcoa.ac.uk/revalidation-cpd
3. The acutely or critically sick or injured child in the district general hospital A team response Department of Health Report 2006.

**Disclosure of Interest:** None Declared

**PO 04-2 - Inter-Professional Simulation in Paediatrics: "Take Back this Experience to the Ward"**

*Interprofessional Education (IPE)*

Submission ID: IPSSW2017-1247

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**Abstract Body:** Delivery of safe, high-quality healthcare requires many different health professionals to work together in a team.1 Team working is best learnt from experience. Multi-professional team training for high risk emergency situations, including paediatric resuscitation, is an important aspect of safe and effective patient care.1,2 Simulation provides experiential learning in a controlled and safe environment and an opportunity to practise clinical skills, communication and team working.1,2

**Description:** A half-day simulation course covering paediatric emergencies and child protection for multidisciplinary team in paediatrics started in 2014. The course runs four times per year. Candidates attend the SimWard high fidelity facility, where they participate in and observe clinical scenarios and their respective debriefs. Candidates act in their own role and are requested to immerse themselves in the simulation and perform as they would in their own work environment.
**Evaluation:** 50 members of staff from the paediatrics department have participated in the inter-professional simulation course in the last 3 years. Each candidate completed an anonymous post-course feedback form, including a 3 or 4 point Likert scale of the quality of the session and their learning during it (table 1) and free text comments on the best aspects and areas for improvement.

<table>
<thead>
<tr>
<th>IPL Simulation Session</th>
<th>Percentage of positive responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant to clinical practice</td>
<td>100%</td>
</tr>
<tr>
<td>Appropriate level of content</td>
<td>88%</td>
</tr>
<tr>
<td>Learning occurred</td>
<td>100%</td>
</tr>
<tr>
<td>Clinical practice will change</td>
<td>94%</td>
</tr>
</tbody>
</table>

Candidates rated the “realistic, high risk, true life clinical scenarios”, opportunities for “team working, communication, team leading”, “non-judgemental environment”, “advanced facilities” and the “detailed breakdown and feedback” during debriefs as the best aspects. Suggestions for improvement included, “more emergency scenarios”, “setting up SimWard more similar to the paediatric unit” and “more regular sessions with a greater skill mix of professionals”.

**Discussion:** Staff who participated in the Paediatric Inter-Professional Learning Simulation Course reported improved self-efficacy in team working, communication and leadership in the management of an acutely unwell child. The team’s patient safety awareness and incident reporting has also improved, suggesting that a change in attitudes and safety culture on the ward has occurred as a result of this inter-professional simulation training.

**References:**

**Disclosure of Interest:** None Declared

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**PO 04-3 - Two Year Experience with a Neonatal Procedure Simulation Boot Camp**

*Simulation Instruction design and curriculum development*

Submission ID: IPSSW2017-1157

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**Abstract Body:** The transition from residency to fellowship can be a challenging time. Pediatric residents are finding fewer opportunities to learn procedural skills; however, as incoming fellows, those in neonatology are quickly placed in situations where emergent or unexpected events require a quick response and procedural competency. Procedural boot camps have been piloted across the country, and have been found to be successful in improving skills and confidence in transitional periods. In order to ameliorate anxiety as well as encourage skill development, we developed a procedural boot camp for the incoming first-year neonatology fellows in the Harvard Neonatal-Perinatal Medicine Fellowship with the SIMPeds Network Team at Boston Children’s Hospital. Our goal over the past 2 years was to provide the incoming fellows with standardized procedural instruction that allows best practices to be taught and reinforced.

**Description:** The boot camp curriculum was designed to combine formalized didactics and simulation-based skill stations. NRP skills were taught in a prior session. Procedures included needle thoracentesis, chest tube placement, pericardiocentesis, intraosseous cannulation, and synchronized cardioversion. Indications, contraindications, equipment, procedural technique, and potential complications were presented. High fidelity
task trainers were utilized at each simulation station with no more than two fellows per station, using procedure checklists to assess individual competence after initial hands-on individualized teaching was completed.

Observation/Evaluation: Evaluation of the program was conducted through the use of anonymous pre- and post-boot camp surveys with self-reported competence on each procedure. The surveys were graded on a 4-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). Overall, participants demonstrated an increase in self-reported competence for all targeted skills, with average scores improving pre-to post-boot camp from between 0.8 to 1.5 points. Their attitudes towards simulation were also assessed, and students overwhelmingly felt that the boot camp obtained its objectives and that simulation was an effective way to teach. Comments included requests for additional skill stations including umbilical lines, peripheral arterial lines, and advanced airway practice.

Discussion: Overall, the boot camp for incoming neonatology fellows served to increase procedural confidence. Our experience showed high levels of satisfaction with the program and active engagement with the high fidelity simulation. Though we hope for the boot camp to increase procedural success, we were limited in our ability to track long-term outcomes. Going forward, the goal is to expand this experience, as well as to develop a curriculum for competency throughout fellowship that focuses on high risk, low volume procedures, with the ultimate hope of a developing a safer clinical environment.

References:

Disclosure of Interest: None Declared
which featured highly were communication, leadership and anticipation/planning. Suggested improvements were to create a more believable environment including equipment, organisation and more frequent sessions.

**Conclusion:** In-situ neonatal simulation training is highly valued by both doctors and nurses and improves their reported confidence – more than a third of reported learning related to human factors. Given the human factors contribution to clinical incidents, this would be expected to improve patient safety. The challenge is to assess whether the improved confidence translates into clinical practice and affects patient outcomes.

**Disclosure of Interest:** None Declared

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**PO 04-5 - Competency In Providing Physiotherapy To Acutely Ill Children: Developing A Simulation Curriculum**

*Simulation instruction design and curriculum development*

Submission ID: IPSSW2017-1053

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**Abstract Body:** Competencies required to provide chest physiotherapy (PT) to children are different from those required in the adult population. However, because the undergraduate PT curriculum is very broad, few hours are devoted to exploring the acutely ill child’s specific needs. Opportunities to practice and integrate the competencies required to treat these children are very limited.

To palliate rare clinical opportunities, high-fidelity simulation (HFS) proves to be a valuable pedagogical tool.  

**Description:** We created a simulation-based workshop to complement the existing undergraduate PT curriculum. This 3.5-hour workshop will include 3 HFS scenarios focusing on skill-practice and knowledge-integration related to acute paediatric chest PT. This mandatory workshop will be part of the Respiratory PT class, taught during the third year of the PT Bachelor’s-Master’s degree at the Université de Montréal in Canada. Three groups of thirty students are scheduled to participate in April 2017.

We followed Kern’s 6-step approach2 to develop this curriculum. The **problem was identified** and a **general needs assessment was performed**. A **targeted needs assessment** is currently being conducted. As such, a 10-item self-completion questionnaire was sent to the two previous cohorts of students who completed the Respiratory PT class. A similar questionnaire was sent to all chest PT clinical supervisors. In addition to gathering basic demographic data, both surveys aim to determine the specific competencies the workshop should focus on to meet the needs of the learners. The key competencies listed in the survey were derived from the undergraduate respiratory PT curriculum objectives. Based on survey’s results, the workshop’s **goals and objectives** will be determined. We selected HFS as the preferred **educational strategy** because it has shown to be an efficient learning tool when clinical practice opportunities are rare3. **Implementation** has been facilitated by the buy-in and financial support of all stakeholders.

**Observation/Evaluation:** Collection of demographic data will provide detailed description of potential learners, an essential step in understanding their needs and in tailoring the workshop. This will also guide the design of future respiratory PT curricula.

Responses from the second part of the survey will be presented using descriptive analysis and will guide development of curriculum objectives.

As a final step, the evaluation of competency and confidence acquisition during the workshop will further assess and highlight the pedagogical value of the curriculum.

**Discussion:** We anticipate that this workshop will provide PT students with a rich opportunity to put into practice specific competencies needed to treat a child with an acute respiratory condition. Based on this comprehensive approach to curriculum development, we will ensure that learning gaps are identified and addressed, and that a bridge between theory and clinical practice is created.
References:


Disclosure of Interest: None Declared

PO 04-6 - Simulation Based Education to Promote Clinical Skills Mastery among Junior Paediatric Trainees

Simulation for procedural and psychomotor skills

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Abstract Body: The Royal College of Paediatrics and Child Health (RCPCH) Curriculum states that paediatric trainees should be proficient in a range of practical procedures by the end of level 1 training. Opportunities for each individual trainee to learn and practise these procedures may be encountered infrequently. In a recent regional survey of level 1 trainees, only 10-60% reported “good or very good experience” with certain skills. Simulation training is known to be effective in improving junior doctors’ practical skills in emergency airway management, advanced cardiac life support, surgery and lumbar punctures.

Educational Goal: To develop a simulation based clinical skills course for level 1 paediatric trainees in the region that will enhance their experience and performance of mandatory procedures.

Proposed Approach: This half-day course in will form the basis of one of the trainees’ monthly regional training days (timetabled in January 2017) and will focus on the teaching and deliberate practice of a pre-determined selection of the 13 mandatory procedures on simulated part-task trainers. The procedures, including lumbar puncture and urethral catheterisation, will be taught using a modified version of the 4 stage technique that is used for skills teaching at the ALSG life support courses. A detailed lesson plan for each station will ensure that trainees learn a standardised, evidence based approach to performing each skill. Trainees will provide pre-course information of their prior experiences of learning and performing paediatric clinical skills. Post course feedback will be collected to evaluate the impact of the “Skills, Drills and Simulation” training day on the trainees’ acquisition of clinical skills and further develop the training for subsequent cohorts.

Difficulties Encountered: Evidence suggests that trainees’ learning, performance and retention of clinical skills is enhanced by simulation training and the trainees’ ability to perform these mandatory procedures will be assessed during and after this course. The long term aim for this project is for an educator and the simulated part-task trainers to be available at every ST1 regional training day throughout the academic year, thus allowing the trainees to utilise their protected educational time for ongoing deliberate practice of these procedures, which will enhance their retention of these essential clinical skills. This will enable a simulated DOPS (Direct Observation of Procedural Skills) assessment of one of the mandatory procedures to be completed by every trainee at a subsequent training session to evaluate their retention of their skills learning and the overall effectiveness of the clinical skills simulation course.

References:

1. RCPCH Run Through Level 1 Curriculum (Procedures). Royal College of Paediatrics and Child Health, London

Disclosure of Interest: None Declared

PO 04-7 - Neonatal LMA Insertion - Use Of Task Analysis To Inform The Development Of A Procedural Checklist Simulation for procedural and psychomotor skills
Submission ID: IPSSW2017-1065

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Abstract Body: Effective positive pressure ventilation is the single most important step in neonatal resuscitation. Neonatal Resuscitation Program (NRP) supports the use of the laryngeal mask airway (LMA) as an alternate airway device when endotracheal intubation is technically challenging (e.g. unsuccessful attempts, airway anomalies, or operator inexperience) (1). Practicing neonatologists have limited experience using an LMA. Proficiency is attained only after 5-24 attempts (2-4) - challenging for any practicing neonologist. Simulation-based training that allows repeated practice and feedback may bridge this gap. Our long term aim is to develop an educational toolkit and checklist for LMA placement. Our specific aim was to perform a task analysis to identify key steps of LMA insertion as an objective method of developing a checklist for teaching and assessing this procedure.

Methods: Literature review revealed one published checklist with insufficient detail to effectively teach LMA insertion (5). A task analysis was performed to objectively detail each step and determine essential actions, optional actions, and decision points. 3 pediatric anesthesiologists (experts) performed LMA insertion on a neonatal task trainer while being videotaped. 5 neonatologists, inexperienced in neonatal LMA insertion, independently reviewed these recordings and the NRP LMA procedural video (1). Independently each developed a script that outlined the steps of LMA insertion which were de-identified and collated. A modified Delphi process was then used to create the checklist. Differences in step sequence and level of detail were resolved by consensus until complete agreement was reached.

Results: Independent review of the videotapes by the 5 neonatologists revealed a median of 16 steps (range 10-20). Step sequence and level of detail varied between neonatologists. Modified Delphi and consensus review revealed 11 main steps, each with a set of associated sub-steps. The main steps include: time out/universal precautions, identification of the indications and contraindications, equipment preparation, patient positioning, patient preparation, correct positioning of the device prior to insertion, insertion, inflation of the cuff, confirmation of device position, securing the device , troubleshooting and resolving complications. Sub-steps ranged from 1-6 for each main step. The final checklist included 16 items.

Conclusion: An LMA insertion checklist was developed using task analysis. Review by inexperienced practicing neonatologists highlighted variation in step sequence, detail level and the importance of novice review to elucidate implicit aspects of the procedure that experts may not readily verbalize. We recommend performing a detailed task analysis, a method that has been applied to surgical simulation (6), prior to development of
procedural checklists. Next steps include cognitive task analysis to determine the most likely technical errors that occur during LMA insertion.

References:

Disclosure of Interest: None Declared

PO 05-1 - Does Video-Assisted Debriefing Support Learners In Making Own Observations About Teamwork?
Debriefing and teaching methodologies
Submission ID: IPSSW2017-1238

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Abstract Body: Learners cannot improve unless they know where improvement is necessary and how the improvements may be made (Mackway-Jones & Walker, 1998). At the same time people are notoriously bad at self-assessing their competence (Davis et al, 2006, Langendyk 2006) and recognizing their incompetence (Dunning et al, 2003). A concern is therefore that those who participate in simulation-training remain unaware of suboptimal behaviors. Debriefing may support abilities to assess performance but there is a lack of research on how debriefing supports observation skills. The aim of this study was to investigate course participants’ experiences of video-assisted debriefing and whether the debriefings supported them in observing good/suboptimal behaviors.

Research Question: Do participants make more observations regarding the teams’ optimal/suboptimal performance before vs. after video-assisted debriefing? What are the participants’ expectations and concerns about the video-assisted debriefing and how do they view it as contributing to their learning?

Methods: Data were collected data from 105 participants in 16 one-day simulation courses with interprofessional teams consisting of 6-9 undergraduate medical, nursing and midwifery students. Using Likert scales, the participants rated their overall performance, feelings of competence, challenge and stress. Before and after each debriefing, students’ rated whether they had made observations about aspects that had worked well as well as aspects that could be improved.

A language analysis tool (Gavagai Explorer) was used to support content analysis on the participants’ free text responses in the questionnaires. The questions addressed what they were hoping to achieve, expectations and concerns regarding video-assisted feedback as well as how it contributed to learning.

Results: The participants expected to be given feedback about good and improvable aspects and although some had concerns about being filmed, they were positive and reported that they learned from the feedback.
The participants rated that they had made significantly more observations about what had worked well (p<0.05) concerning teamwork after the debriefings compared to before the debriefings. Similar results were obtained for observations about what could be improved (p<0.05). The results were consistent regardless of whether the simulation performance was considered good or bad or whether participants felt challenged or stressed or not. Nevertheless, none of the participants indicated that they expected to become better at making observations about their own or the teams' performance, nor did they report this afterwards.

Discussion/Conclusions: The participants considered video-assisted post-simulation debriefing to be very useful and eye-opening. They also made more observations after taking part in the debriefings. However, few appear to reflect on that they are developing their own competencies in observing and analyzing medical teamwork.

References:

Disclosure of Interest: None Declared
Results: 26 interns were enrolled and completed the initial NRP training. 20 interns completed the 1-month follow-up resuscitation scenario. There was no significant difference in knowledge between the two groups after the initial NRP training or at the 1-month follow-up. There was a trend towards increased confidence with regards to being a team member & a team leader in the RCDP group vs the traditional group after the initial training, however this effect did not remain at the 1-month follow-up. There was however a significant improvement in the performance of the RCDP group compared to the traditional group at 1-month follow-up: the RCDP group administered positive pressure ventilation, intubated, started CPR, gave epinephrine & completed the resuscitation significantly earlier than the traditional group.

Conclusion: This data suggests teaching NRP using RCDP methods does not alter knowledge or confidence but may improve retention of resuscitation skills among first time NRP certifiers. Additional studies are necessary to determine whether this effect can be seen in those re-certifying at 24 months.

References:

Disclosure of Interest: None Declared
participant talking time during debriefings was significantly less in countries with high PDI (.234, p .022); (H2) the higher the PDI the less participants interact amongst themselves (-.306, p .004); (H3) leading questions dominated the discussion (.283 p .005) in high PDI countries; (H4) interactions were initiated by debriefers in high PDI countries (.238, p .022); (H5) the debriefing content in high PDI countries conveyed more technical rather than non-technical knowledge (-.374 p .000); (H6) speaking up (.354 p .002), closed loop communication (.507 p .000), system challenges (.381 p .001) and situational awareness (.247 p .028) were significantly more difficult to discuss in high PDI settings.

Qualitative Analysis: Participants were asked 1) to explain why certain non-technical skills were more difficult to discuss and 2) what other culture-relevant debriefing aspects they would like to elaborate on. Responses ranged from a few words to paragraphs and were analyzed qualitatively using content thematic analysis. Meaning units were defined and categorized and two domains were identified: “Hierarchy Rules” and “Cultural Rules.” Within these domains, various themes and subthemes emerged. Multiple relationships and subtle nuances were revealed amongst these themes/subthemes and the original domains such as professional hierarchy and expectations of knowledge and gender imbalance; communication barriers and willingness to volunteer lack of knowledge and, fear of judgment from peers and colleagues.

References:
2. Raghunathan, K. Checklists, safety, my culture and me. BJM Qual Saf 2012; 21(7): 617-20

Disclosure of Interest: None Declared
Conclusion: It is anticipated that these steps may help to reduce the fear around simulation and hence improve engagement from the MDT in participating and learning through simulation. We will conduct a post-intervention survey in 3 months alongside an analysis of feedback from each simulation session. Comparison to pre-intervention data will inform us on the effectiveness of the new approach.

Conundrums:
1) An element of nervousness may be inevitable, and in fact could help to simulate real life emotions when faced with managing an acutely unwell child.
2) Although confidentiality within simulation education is promoted; there may be occasion when concerns regarding patient safety outweigh the interest of confidentiality.

Disclosure of Interest: None Declared

PO 05-5 - Rapid Quality Improvement Through Interdisciplinary Debriefing
Patient safety and quality improvement
Submission ID: IPSSW2017-1132

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Abstract Body: Rapid Quality Improvement through Interdisciplinary Debriefing
Cynthia Gardell MSN, MBA, RN, NE-BC*
Constance S. Houck, MD, MPH, FAAP
Julee Bolg MS, MBA, RN, NEA-BC

Context: Providing high-quality pediatric and adolescent care in a community setting necessitates the use of innovative strategies to quickly identify opportunities for improvement in care delivery. During emergency response, effective teamwork based on the principles of crisis resource management (CRM) supports patient safety and quality care.1 Debriefing, originally used in aviation and the military, is increasingly being used in healthcare to support timely quality improvement efforts.2,3 Incorporating principles of effective teamwork into debriefing may best support improvement efforts and subsequently offer the greatest impact on patient outcomes.4

Description: An interdisciplinary team, working at a satellite location of an academic pediatric medical center, implemented a program to debrief rapid response team activations within 48 hours of the event. A standardized form based on CRM principles guides the review and supports the identification of educational needs, and gaps in technology, processes, policies, and resources. Subsequently, the team leader provides a written summary of the event, identified improvement opportunities, and outlines specific action items. Interdisciplinary stakeholders then review the summary and identify items for rapid improvement projects. The creation of explicit action items is a key driver for the implementation of rapid improvement initiatives.5

Observations: From October, 2015 to August, 2016, 62 debriefings were held. The interdisciplinary debriefings identified 26 educational opportunities and the need for additional resources in four areas. Additional outcomes included nine technology improvements, 20 process improvements, and four policy updates.

Discussion: Debriefing after rapid response team activations resulted in prompt recognition of opportunities for improvement, enhanced communication, and initiated positive feedback from team members. The principles of CRM were effectively used to guide reflection and analysis of critical incidences and highlight areas for rapid improvement initiatives.

References:


PO 05-6 - Newer Ventilation Modalities In Neonatology - Use Of Simulation In Education And Problem-Solving

Patient safety and quality improvement

Submission ID: IPSSW2017-1096

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Abstract Body: Mechanical ventilation is used frequently in the neonatal intensive care setting, and it is a vital tool for supporting the respiratory system of sick babies. Time-cycled pressure-limited ventilation had been the mainstay of neonatal ventilation for many years(1). However, novel ventilator modes have been developed to optimise support while aiming to minimise lung injury. As navigating the different modalities becomes more complex, we discuss the use of simulation to teach staff about the use of different settings, as well as its value in solving problems that arise when adopting these newer techniques.

Description: Research has supported the transition from pressure-limited to volume-limited ventilation(1), and in the last few years this has become the standard on our neonatal intensive care unit (NICU). It is still not used uniformly across the UK and many staff begin work at our NICU with no experience in this modality. Education takes place in the form of simulation, using the ventilator and a ‘test lung’, which is a specially designed bellow acting as a neonatal lung, and can be modified to simulate different scenarios.

This experience has proved useful not only in education but also in solving problems, such as when we changed our method of delivery of high-frequency oscillation ventilation (HFOV). In our NICU, HFOV is currently used as a ‘rescue’ treatment when conventional ventilation has failed. Previously this has necessitated changing the baby across to a specific oscillator. Recently, the unit has invested in ventilators that can deliver both modalities. However, some babies did not appear to respond to HFOV delivered by the newer machine and staff continued to switch between the two ventilators. To assess this, why this was the case, simulation was used with a ventilator and a test lung.

Observation: The problem appeared to be due to an inability to deliver higher amplitudes on the newer ventilator while on the standard frequency setting of 10Hz which is very rarely altered. However, as this was altered, we found that we were also able to provide increased amplitude. Trialling different settings allowed us to produce a table detailing how to best use the parameters to achieve the required results. This information was then disseminated using simulation teaching. This enabled staff to more confidently use one machine to provide both conventional and oscillation ventilation.

Discussion: As ventilation modalities become more complex, and different practices are adopted, health care practitioners can find themselves exposed to situations they are unfamiliar with. Simulation is not only a safe method of education with regards to the practical use of these techniques (2), but can also be used to experiment with settings and solve problems without having to affect the care of sick patients. In the future we aim to assess the effectiveness of these changes in terms of staff confidence and patient outcomes.


Disclosure of Interest: None Declared
PO 05-7 - Improved Safety And Cost Savings After Sim-Based Education For Ortho Surgery Residents

Patient safety and quality improvement
Submission ID: IPSSW2017-1172

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Abstract Body: Simulation-based training may improve healthcare value by improving outcomes and minimizing complications. However, there is limited information regarding the cost-effectiveness of simulation curricula. The purpose of this study was to estimate the cost effectiveness of simulation training aimed at reducing cast saw injuries by orthopaedic surgery residents.

Research Question: What is the clinical efficacy and return-on-investment (ROI) of simulation-based training aimed at reducing cast saw injuries by orthopaedic surgery residents?

Methods: Third-year orthopaedic residents rotating at a children’s hospital underwent simulation-based instruction on distal radius fracture (DRF) reduction, casting, and cast removal using an oscillating saw. The incidence of cast saw injuries was analyzed before and after implementation of the simulation curriculum. Actual and potential costs associated with cast saw injuries included wound care, extra clinical visits, and medicolegal expenses (indemnity payments and legal expenses). Medicolegal expenses were provided by the Controlled Risk Insurance Company (CRICO), the medical malpractice insurer for the Harvard medical community. Curriculum costs were calculated using time-derived activity-based accounting methodology. The costs of cast saw injury and the simulation curriculum were compared to determine overall savings and return-on-investment (ROI).

Results: In the 2.5 years prior to simulation, cast saw injuries occurred at a rate of approximately 4.3 per 100 casts cut by orthopaedic residents. For the 2.5-year period post-simulation, the cast saw injury rate decreased to approximately 0.7 per 100 casts cut (p=0.002). The total cost to implement the casting simulation-based workshop was $2,465.31 per 6-month resident rotation. Actual costs attributed to cast saw injuries per resident rotation were $65.83 before simulation, and negligible after simulation. Based on historical data, the potential total payment (claims) related to improper casting technique or cast saw burn that resulted in payment (n=13) ranged from $2,023 and $99,373 per claim. The anticipated savings from averted cast saw injuries and associated medicolegal payments in the 2.5 years post-simulation was $27,131, representing an 11 to 1 ROI. Maximum potential savings were estimated at $104,594 with potential return of 42 to 1.

Conclusions: The simulation-based training for orthopaedic surgical residents was effective in reducing cast saw injuries in a pediatric setting and had high theoretical ROI. These results support further investment in simulation-based training as cost-effective means of improving patient safety and clinical outcomes.

Disclosure of Interest: None Declared

PO 06-1 - The FACT for Pediatric Trauma: Observing Community Hospital Care in the 1st 5 Minutes

Educational Outreach (Including remote, rural and international simulation education)
Submission ID: IPSSW2017-1232

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Abstract Body: Trauma is the most common cause of death in children from 1-18 yrs. The European Trauma Course (ETC) teaches the primary survey, and resuscitation adjuncts. The primary survey identifies life-threatening conditions and management. To succeed teams must be systematic and exacting. The survey should take less than 5 minutes. The purpose of this study was to conduct baseline measurements of task completion in the 1st 5 minutes for pediatric trauma care with onsite simulations case representing head injury
and hemorrhagic shock using the Primary Survey Score. This scoring tool was devised following the method outlined by Stufflebeam.6

**Methods:** Criteria for successful task completion were based on practices outlined in the ETC and reviewed and revised by an expert consensus group. Tasks were evaluated on 1st completion. Each task was scored from 0 to 2 points. No points were given if not completed. One point was assigned if the time to completion was > 5 minutes, or was partially performed. 2 points for fully completed. The percentage of items completed correctly was calculated as a summary % score. The checklist was adjusted for each case. The tool was piloted by observing teams in 10 UK hospitals video-recorded resuscitating high fidelity 2 pediatric cases conducted in situ as “surprise” events. Piloting sessions used 2 raters scoring independently and recording scores on computer-based forms. Data analysis: 1. Primary Survey Score % completion score. 2. Quality composite score. 3. Estimating rater reliability with calculation of intra-class correlation coefficients. 4. ANOVA calculations for each specific item.

**Results/Data Analysis** (preliminary) for 26 scenarios (40 anticipated): Mean completion Primary Survey Score = 73.1% Range 38-93%. All scenarios scored (14/14) included A/B assessments. Most commonly omitted score items included D-disability (11/14), Exposure (9/14) and C-circulation (6/14). Intra-class correlation coefficients (ICC) were used as a measure of inter-rater reliability. The IBM Statistical Package for the Social Sciences 19 (Armonk, NY: IBM Corp) was used for this analysis. Results: A high degree of agreement was found in the raters' checklist score for both scenarios, Time Critical Head Injury (TCHI), .940 with a 95% CI from .803 to .982 (F(12,12) = 16.605, p<0.001) and Major Hemorrhage with shock (MH), .963 with a 95% CI from .880 to .989 (F(12,12) = 27.335, p < 0.001).

**Preliminary Conclusions:** The resource-intensive and time-sensitive nature of trauma care creates a complex system with several potential pitfalls and vulnerabilities. The newly developed Primary survey score represents a potential means to measure initial pediatric trauma stabilization strengths and areas for targeted training needs. Thus far onsite simulations suggest the need to improve care and suggest the need for checklist implementation.

**References:**

**Disclosure of Interest:** None Declared

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**PO 06-2 - Multidisciplinary Teamwork Acute Pediatric Care Patient Based Simulation Training In Guatemala**

**Process improvement and organizational change**

Submission ID: IPSSW2017-1246

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**Objectives:** Improve the skills, knowledge and attitudes to approach of Pediatric Acute Care Patient scenarios in Multidisciplinary Team in a Public Hospital in Labor Day training. During January-November 2016.
**Methods:** A simulation based scenarios of Acute Pediatric Care Patient are developed in pediatric emergencies simulation center - SOYUTZ- (mixed Russian-mayan word – soyuz and utz means GOOD UNION) in Hospital General San Juan de Dios, Guatemala City. Where is developed the Pediatric Critical Care postgraduate course of Universidad de San Carlos de Guatemala. During 2016 Pediatrics residents, Pediatric Critical Care, Nurses, Respiratory Care Therapist, Surgery residents, Anesthesiology residents and medical students are involved. Each week 2 -3 developed a 1 -2 hour lesson based in simulation. Almost 80 students participates during the education program.

**Results:** All of the participants participate in the scenario brief, developing the scenario, debriefing and check list based performance. All of them describes Simulation based training improve reach common objectives, reduce conflicts and feel better environment to develop the work during this year. Everyone says are interested in continue the formation and use as quality improvement method in a country where educational resources outside hospital are difficult by schedule and price.

**CONCLUSION:** The Pediatric Acute Care Simulation based program is useful to discuss common goals and objectives developing teamwork and decision making better for the healthcare professionals and patients.

**Disclosure of Interest:** None Declared

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**PO 06-3 - Challenges Of Multi-Disciplinary Simulation – Do We Meet Everybody's Needs?**  
*Interprofessional Education (IPE)*  
Submission ID: IPSSW2017-1111

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**Abstract Body:** Simulation is a popular learning tool as it offers trainee participation and learning from mistakes without serious implications. Trainees can prepare for clinical emergencies within a safe learning environment. Learners also address non-technical skills (communication, team working and decision-making skills) that are pivotal to successful patient outcome. When managing a critically ill child healthcare professionals of different levels and specialities work together to provide high quality patient care. Multidisciplinary team training in simulation is allows all members to practice high-risk situations their clinical and non-clinical skills jointly. However, ensuring that all learners, who are of different levels and specialities, benefit from simulation training is challenging as they their learning needs and priorities vary.

**Methods:** Since September 2016 weekly multi-disciplinary simulation training is integral part of our paediatric teaching curriculum. Sessions alternate between neonatal and general paediatric topics. Standard participants have been paediatric trainees of all levels of training, and paediatric and neonatal nurses. Paediatric sessions were extended to include anaesthetic and emergency medicine trainees, and anaesthetic and emergency medicine nurses. Sessions last 1h and topics cover common clinical emergencies. Debrief is led by a group of senior paediatricians. Each session concludes with written evaluation of the session including on usefulness to clinical practice, difficulty level, involvement in learning process, conduct of debrief and overall usefulness of the session.

**Results:** Over three months 10 simulation sessions were held – five paediatric and 5 neonatal. Participants of neonatal sessions included paediatric trainees and neonatal nursing staff. 80% of the paediatric sessions included anaesthetic and emergency medicine trainees and nurses. During debrief all learners were encouraged to participate and ask questions. Written feedback showed that sessions were overall scored highly on usefulness by all participants. All participants valued training with colleagues of different specialities and felt that this enhanced mutual understanding and learning. Anaesthetic and emergency trainees generally rated the sessions higher than their paediatric trainees. Nursing staff especially nursing students felt less involved in the learning process. Written feedback in particular of nursing staff expressed a wish for nursing faculty.

**Conclusion:** Multi-disciplinary simulation training is supported by all learners. However, to meet each groups learning needs faculty also needs to be multi-disciplinary and in particular include nurse facilitators. This is a
challenge at present. Also, it has been difficult to ensure that other specialities do facilitate for their staff to attend these joint sessions.

References:

Disclosure of Interest: None Declared

PO 06-4 - Transforming Conversations That Matter: Innovative Interprofessional End Of Life Education
Interprofessional Education (IPE)
Submission ID: IPSSW2017-1049

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Identification of Learning Gap: Pediatric nurses who work on general surgical or medical units lack knowledge and skills for effective end of life communication.

Abstract: Overcoming communication barriers with patients and families facing end of life improves the end of life experience (Beckstrand, Rawle, Callister, & Mandelco, 2010). A needs assessment demonstrated that inpatient pediatric surgical nurses felt uncomfortable communicating with patients and families around end of life topics. Based on the feedback in the needs assessment, the nursing professional development specialists, with the help of a graduate student, developed a four hour interprofessional education program that included role playing opportunities, practice with open ended questions and a Zone 3 Simulation and debriefing (SIMPeds, 2016). The interprofessional group included a rabbi, Imam, social worker, child life specialist, nurses, and clinical assistants. During the simulation experiences the attendees participated in a time lapse scenario that utilized actors to bring realism to the scenario and provided the learners with the opportunity to practice the communication strategies reviewed in the didactic portion of the course. The simulation experienced engaged all participants and encouraged them to demonstrate the communication strategies based on their individual areas of expertise. At the completion of the simulation experience, the learners are provided with an opportunity to practice post-mortem care and are invited to tour the morgue. Nurses were given a pre and post knowledge check, to measure impact of education. Outcomes included an enhanced knowledge of communication skills around developmentally, culturally and socially appropriate concerns at end of life. Participants reported that they feel more comfortable speaking with patients and families during end of life issues after attending this program.

References:

Disclosure of Interest: None Declared

PO 06-5 - IPE Simulation Enhances The Quality Of Care In Neonatal Hyperammonemia
Interprofessional Education (IPE)
Submission ID: IPSSW2017-1021
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Abstract Body: Rapid blood clearance through continuous renal replacement therapy (CRRT) should be considered for neonatal hyperammonemia when medical therapy will not rapidly clear the ammonia and irreversible brain damage might occur. The complexity of extracorporeal blood clearance might affect the quality of care in that critical time. Inter-professional education (IPE) simulation-based training can fill the gaps of the multidisciplinary collaborative team management and improve the outcome in neonatal hyperammonemia. The purpose of this study is to evaluate the effectiveness of IPE collaborative practice in the management of neonatal hyperammonemia through the simulation training.

Methods: One full day IPE simulation workshop was conducted in our institute for pediatric CRRT multidisciplinary team quality training. The Prismaflex® System from Gambro for CRRT and neonatal manikin were used. After theoretical background, the inter-professional team practiced hands-on the CRRT for 90 minutes. Simulation specialist facilitated the scenario over three phases with advocacy-inquiry and plus-delta debriefing formats in between the phases for 180 minutes. Two tools were used to assess the workshop learning outcome. The first was a self-assessment pre & post surveys. The second was the expert facilitator’s assessment through a standardized checklist.

Results: The results showed a significant improvement in CRRT cognitive learning and psychomotor skills among the team as documented by the pre and post surveys. Inter-professional education and collaborative practice was also improved by the third phase compared to the prior two phases and their debriefing. This was observed by the means score improvement of the standardized checklist that documented by the experts in the field.

Conclusions: This neonatal CRRT simulation training demonstrated a very effective learning achievement that can improve the patient outcome in real situation of neonatal hyperammonemia. We recommend simulation workshop or in-site (point of care) simulation training to enhance the quality of care of complex neonatal management.

References:

Disclosure of Interest: None Declared
Abstract Body: The majority of childhood deaths in the developing countries happen from preventable and reversible causes (1, 2). There is a need of international collaboration, and research strategies to enhance the care of critically ill children in developing countries. Simulation training provides a unique opportunity to captivate learners despite language, distance and cultural barriers (3, 4). We developed a novel electronic tool, the Checklist for Early Recognition and Treatment of Acute Illness in Pediatrics (CERTAINp) to standardize the approach to the evaluation and treatment of acutely decompensating pediatric patients. This study was conducted to determine the feasibility of remote training of international pediatric intensive care unit staff using CERTAINp and to evaluate impact of the training on improving the process of care during rounding and admission scenarios.

Description: We conducted train-the-trainer sessions in 7 hospitals based in 5 different countries (China, India, Congo, Turkey and Croatia) between 11/2015 and 11/2016. Providers first took part in a base line simulation session to assess their performance. Learners had structured hands-on training using CERTAINp, which was done remotely using video conference with recording capabilities. Performance in rounding scenarios was assessed by their adherence to standard of care guidelines using CERTAINp. After this training, the learners were re-evaluated for performance using a validated instrument by two independent trained reviewers (5).

Evaluation: A total of 23 providers from 7 centers completed both baseline and post education sessions. 8 providers of these centers were assessed for completion of 18 critical tasks in rounding scenarios before and after training with CERTAINp. Compliance to standard of care guidelines improved overall from 45% to 93% in all data points, with increase in adherence to delirium assessment, spontaneous breathing trial and bowel protocol. We observed improved critical task completion in 9 subjects in the admission scenarios where pre training task completion was 8.2 ± 2.64, while after remote training was 11.2± 1.79 (out of total 14 tasks). There was significant improvement in review of allergies (p=0.016), review of differential diagnosis (p=0.023) and review of exposure assessment (p=0.018), while there was overall improvement after remote training with CERTAINp (p=0.01).

Discussion: We observed an improvement in compliance for measures determined as best practice guidelines in rounding and overall improvement in critical tasks for admission cases after remote training. The development of CERTAINp is innovative since this will offer an unprecedented flexibility on a large scale with minimal cost while delivering high quality evidence based care to critically ill children worldwide (6-8). Impact of this training on clinical outcomes is currently being evaluated in a multi centric study (ClinicalTrials.gov NCT02398981).

References:


Disclosure of Interest: None Declared

PO 06-7 - Pediatric Acute Care Course Simulation Based In Guatemala

Educational Outreach (including remote, rural and international simulation education)
Submission ID: IPSSW2017-1250

Luis A. Moya-Barquin1
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Abstract Body: Improve the skills, knowledge and attitudes to approach of Pediatric Acute Care Patient scenarios in community health services and first level clinical in Guatemala metropolitan area.

Methods: A simulation based scenarios of Acute Pediatric Care Patient are developed in pediatric emergencies simulation center - SOYUTZ- (mixed Russian-mayan word – soyz and utz means GOOD UNION) in Hospital General San Juan de Dios, Guatemala City. Where is developed the Pediatric Critical Care postgraduate course of Universidad de San Carlos de Guatemala. This course begins in November 2016 and will be take in weekly sessions in January-June 2017. An electronic documents were distributed and the simulation session will be developed based to reach an objective based in schedule.

Results: 30 nurses, primary care doctors and medical students are involved. The common scenarios based in the cardiopulmonary assessment, high flow oxygenation, intraosseous needle, EZIO placement, clinical monitoring in shock, shock index approach, septic shock approach, trauma approach, cardiopulmonary resuscitation, vasoactive drugs, airway foreign body, fluids, head trauma and severe electrical injuries are developed for resources available in primary care and first level health care in rural places in Guatemala. A scenario production, scenario development, and checklist were available to perform the analysis over each session. The main idea is reach as educational level to reach competences and capabilities to early recognition and star the chain of survival in places out of hospital and reduce delays and pitfalls in the transport. This course had the endorsement of the Ministerio de Salud Publica y Asistencia Social de Guatemala (Ministry of Health) and the Universidad de San Carlos de Guatemala as a first step to give a nationwide certificate to improve outcomes and level of care in rural hospitals and rural clinics. Because the performance and certification of the health personnel is not accurate yet; to improve PATIENT SAFETY we use simulation as a tool to acquire skills, attitudes and knowledge.

Conclusion: Simulation based Pediatric Acute Care is a useful tool, that can train health personnel with patient safety for primary care, rural hospitals and clinics in nurses and doctors in metropolitan and rural places in Guatemala. Is a first step to make a nationwide pediatric certification.

Disclosure of Interest: None Declared

PO 07-1 - Systems-Focused Simulation In A Non-Clinical Unit: The New Seattle Children’s Hospital Kitchen

Patient safety and quality improvement
Submission ID: IPSSW2017-1223

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Abstract Body: Systems-focused simulation has been used to identify latent safety threats and evaluate new processes in clinical units. In December, 2016, Seattle Children’s Hospital opened a new kitchen with completely new processes, featuring made-from-scratch whole foods and a new room service delivery model. As part of our hospital’s integrated facility design, we used simulation to evaluate its functionality prior to opening.

Objectives: Use systems-focused simulation to:
- identify latent safety threats,
- validate new environment, processes, equipment and roles,
- identify systems integration opportunities, and
- inform staff training plans.

Methods: Working with unit leaders, we identified new environments, processes, equipment, technology, and roles/responsibilities associated with the new kitchen. We identified the highest risk and highest impact changes. We designed a two-day simulation event incorporating all areas of the new kitchen (e.g., call center, food production, delivery, sanitation). The simulation used prior volume modeling to recreate routine non-peak and peak meal volumes. It incorporated high risk events such as computer downtime, kitchen fires and medical emergencies. Using existing patient data and the new menu, simulated patients and meal orders were created to reproduce a realistic distribution of regular, modified and allergy meals. Kitchen staff participated in the simulation events. Kitchen and hospital leadership and staff observed the simulations. Observers recorded issues which were collected in a central database. Each issue was reviewed by a kitchen and a facilities leader, prioritized based on safety risk (critical, high or normal) and theme. Issues were then assigned to area leaders and tracked for resolution.

Results: 111 people participated in the two-day simulation event, including 88 participants and observers, 18 simulation instructors and 5 administration staff. 437 meal and snack orders were placed, produced and delivered. Over the two-day event, 846 unique issues were identified. Of those, 14 issues (1.6%) were “critical” and 34 (4%) “high risk”. Critical issues included: inaudible code alarms, lack of fire pull within the kitchen itself, inability to pull existing fire alarm, wayfinding in an emergency, lack of standard wayfinding language, no access to a code cart in an emergency. Thirteen (93%) of the identified critical issues and 20 of the 34 (59%) high risk issues were resolved prior to the kitchen opening.

Discussion: We successfully applied a systems-focused simulation process designed for a clinical unit to a nonclinical area. In the simulation event, we identified latent safety threats, validated new environment, processes, equipment, and roles, identified systems integration opportunities, and identified additional training needs for both clinical and non-clinical staff. The majority of the critical and high risk safety issues identified were resolved prior to opening.

Disclosure of Interest: None Declared

PO 07-2 - Assessing PICU Mattress Compressibility With Standard Backboard And Real-Time Feedback
Patient safety and quality improvement
Submission ID: IPSSW2017-1042

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Abstract Body: Quality of cardiopulmonary resuscitation (CPR) and depth of chest compressions (CC) during cardiac arrest is highly associated with patient survival and good neurological outcomes. Previous studies show that mattress compression occurs during CPR and can alter the amount of CCs given with adequate depth. The use of a backboard has been known to partially attenuate this effect.
Objectives: In this study we aim to address how mattress compressibility influences CPR quality on two types of PICU mattresses with and without the use of a CPR backboard. We also aim to describe the influences of 2 different feedback sources on CPR quality.

Methods: The study utilizes a cross-sectional, self-controlled study design. Health care providers performed 1 minute of chest compressions on a manikin in each of the following four conditions: (a) manikin on a PICU mattress; (b) manikin on a PICU mattress with CPR backboard; (c) manikin on a memory foam PICU mattress; (d) manikin on a memory foam PICU mattress with a CPR backboard. Participants repeated chest compressions twice in each of the four scenarios with 2 different sources of real-time feedback, an internal sensor measuring sternum-to-spine compression depth of the manikin only and an external acceleration sensor measuring total displacement (sternum-to-spine compression depth + mattress compression depth). The differences of 2 measures (depleted compression depth) was summarized and compared with 1-way analysis of variance.

Results: A total of 16 healthcare providers were recruited and a total of 12101 compression depth data collected in the study. When internal device was used for source of CPR feedback, participants were able to provide guideline compliant CPR (CC depth 50-55mm), mean depleted compression depths (percentage) were 47.7mm (47.5%) with PICU mattress only, 34.8mm (40.4%) with PICU mattress plus backboard, 34.7mm (39.2%) with memory foam mattress only, and 24.6mm (31.2%) with memory foam mattress plus backboard. The differences in depleted depth were statistically significant (p < 0.001). When external acceleration sensor was provided for source of CPR feedback, participants failed to perform guideline-compliant CPR (sternal-to-spine compression depth: 38-46 mm) in all 4 scenarios despite effort.

Conclusion: Chest compression performed on memory foam mattress with CPR backboard achieved minimal mattress compressibility. However, the depleted compression depth was still substantial even in the best scenario. When using real-time feedback, healthcare providers should consider devices that measure sternal-to-spine displacement.

Disclosure of Interest: None Declared
• Bedside practitioner knowledge of accessing floor emergency alarm
• Removal of ETT and bag mask ventilation when EtCO2 tracing lost
• Recognition of arrhythmias including Vtach and PEA
• Specific techniques for open chest CPR procedures
• Recognition of cardiac tamponade and procedure for emergent pericardiocentesis
• Practitioner knowledge of replacement procedure for an immature tracheostomy
• Diagnosis of tension pneumothorax and review of decompressive procedure
• Administration of hypertonic saline through a PIV

Discussion/Conclusions: Recent shifts in approach to identifying errors have evolved from person based to a system based mentality to better identify latent safety threats that can potentiate adverse events. Our pilot study utilizes frequent, rapid low-fidelity simulation at the bedside with routine staff to identify latent safety threats in our ICU. A total of 39 simulation events have been conducted thus far with substantial LSTs identified. As increased identification of LST occurs in the critical care setting, we will create process/educational changes to prevent future adverse events. Although translation to real-life situations is not currently a focus of this study, it is a target for a broader planned study in the future.

References:

Disclosure of Interest: None Declared
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**Abstract Body:** Our aim was to establish an organisational culture of proactive risk management that positions staff as part of the solution rather than a problem to be solved. In order to achieve this we set out to break down traditional silo’s between simulation based education, Patient Safety, Risk Management and Quality Improvement. Our existing institutional approach to error investigation focused on the investigative process with investigative techniques that focused on a safety I approach to error, i.e. doing a Root Cause Analysis, finding the person at fault and “training” them. It did not take into account the complexity and variability within which individuals practiced. We therefore identified the development of an investigation of error course that armed patient safety investigation team with the skills to:

1. Analyse events by taking into account human performance, the systems and the reality of their circumstances.
2. Engage clinical teams in the investigative process and support them through a process of finding reliable and implementable solutions to identified problems.
3. Take a leadership role in the implementation of the investigative process and the implementation of identified solutions to effect meaningful change.

Our curriculum development team comprised of individuals with a background in Simulation, Patient Safety, Risk Management and Quality Improvement. Drawing on principles and skills from each of our respective fields we developed an approach that incorporates Safety-I and Safety–II thinking into the practical implementation process of incident investigation and change management that leads to implementation of lessons learnt at departmental and organisational level.

Following the course candidates have:

An understanding of the human element of a patient safety incident – why we make mistakes
- An appreciation of the need to understand the individual’s reality of their situation during the incident and the need for it to be considered in the investigative process.
- Ability to incorporate human factors insight into the investigation process to maximise engagement and learning
- Ability to recognise the benefits of a structured approach to patient safety investigations
- Ability to apply debriefing skills to the inquiry and team support aspects of root cause analysis investigations.
- Explored the importance of understanding conflict, leadership and team working for effective investigation.
- Skills to engage clinicians and managers with the action plan to both implement and sustain meaningful change.
- Ability to share learning and use quality improvement methodology to implement actions from investigations

In addition the course gives candidates the opportunity to practise the implementation of an incident investigation with the support of experienced facilitators.

During our presentation we will highlight the skills taught during the 3 day course and present follow up data on the implementation of the new approach in clinical practice.

**Disclosure of Interest:** None Declared

**PO 07-5 - Implementing Just In Time Clinical Resuscitation Training in the Intensive Care Unit**

*Patient safety and quality improvement*

Submission ID: IPSSW2017-1231

Shekinah Hensley RN CCRN MSN 1, Beth Kalb RN CCRN MSN 2, Jay Rilinger MD1, Jenna Miller MD FAAP* 1
Abstract Body: With ICU bed expansions, nursing resuscitation experience have become less frequent. A needs assessment was conducted in one large academic pediatric and one private adult ICU to evaluate nursing resuscitation experiences including: clinical resuscitation participation, bag/mask ventilation, chest compressions, vasoactive medication use, code recording, emergent intravenous/intraosseous access, intubation assistance, cardioversion/defibrillation, and external pacing. The pediatric nursing staff survey showed 30-86% with two or fewer experiences for seven of nine tasks assessed. The adult nursing staff survey showed 30-50% with two or fewer experiences in seven of nine tasks assessed. Simulated resuscitation events are an effective tool for increasing exposure, confidence and knowledge. Traditional high fidelity simulations are resource intensive and time-consuming without showing educational superiority.

Description: Code Lite was developed by an ICU based team as a Just in Time simulation program. It is a quality improvement initiative to address the educational needs of the nursing staff while minimizing cost and time commitments. Code LITE is a Low-tech, Internal, Training Experience. The facilitators are clinical nurses and physicians from the ICU who write clinical scenarios along with desired interventions for ICU patients. Each Code LITE is timed for 15 minutes. The scenario is runs for 10 minutes regardless of how many desired interventions are achieved. The debriefing is timed for 5 minutes. The scenarios are set in the ICU. The interdisciplinary participants including nurses, respiratory therapists, pharmacists and physicians are on-shift. It is conducted weekly in the ICU alternating between days, nights, and weekends.

Observation/Evaluation: Participation and engagement has been excellent and most planned simulations were completed. The 10 minute scenario has allowed for the varying experience of participants to tailor the experience to the learners present. The unconventional short time for the debriefing has been successful as it served as a time guide. The debriefing session often ran longer, up to 17 minutes. Participants were asked to score their confidence in performance post-simulation experience between 1 (basic) and 10 (expert). Adult nursing participants reported a score of 7-8 for six tasks assessed. Pediatric nursing participants reported a score of 5-8 for six tasks assessed. Between May and December of 2016, there have been over 25 sessions and greater than 100 nursing participants.

Discussion: We demonstrated feasibility of simultaneous implementation of low-tech simulation training experience across both adult and pediatric settings. It has been feasible for the entire multidisciplinary team attend theses short sessions. The nursing feedback has been exceptional. We will continue to track nursing evaluation of the training with the goal to continue to optimize the learning experience provided.

References:
2. Fisher, D., & King, L. An integrative literature review on preparing nursing students through simulation to recognize and respond to the deteriorating patient. Journal Of Advanced Nursing, 2013.69(11).

Disclosure of Interest: None Declared

PO 07-6 - Identifying Latent Patient Safety Threats Using In-Situ Simulation With Multi-Disciplinary Teams At Starship Hospital, New Zealand
Patient safety and quality improvement

Trish Wood*, Michael Shepherd, Gabrielle Nuthall, Sarah Jamison and Anna-Marie Grace

Abstract: In-situ training using simulation has been used to identify latent safety threats in the healthcare environment. Latent safety threats are errors in the design of the environment, organization or maintenance that are found to have potential impact on the delivery of healthcare and patient safety.

In the perinatal environment, several programs of in-situ simulation have reported successful identification of latent environmental treats to patient safety (Hamman and Riley, 2010). The most extensive of these was able to demonstrate a significant benefit of in-situ training across a range of locations (Riley, 2010). In neonatology, a multidisciplinary team training program using in-situ simulation identified an average of 1.8 latent safety threats per scenario (Wetzel, 2013). In the Emergency Department (ED) setting, short unannounced simulations were able to identify approximately 1 latent safety threat per simulation (Patterson 2013).

It is not a lack of clinical knowledge or skills that result in poor patient outcomes; rather it is deficiencies in teamwork, systems or processes (Fung, 2015). Emergent or high stakes situations require a practiced and coordinated response between the teams involved. Crisis Resource Management (CRM) multidisciplinary team training uses simulation to bring together clinicians from various professions to practice for real life emergencies.

The most tangible outcomes of the Starship Children’s Hospital in- situ simulation programme has been the identification and modification of quality and safety issues. A diverse range of latent safety threats, critical organisation or department wide educational deficiencies and resource deficiencies have been identified across the institution.

Table - Examples of latent safety threats and resource deficiencies identified at Starship Children’s Hospital

<table>
<thead>
<tr>
<th>Department</th>
<th>Threat or Gap identified</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Organisation</td>
<td>Several examples of potentially fatal medication use</td>
<td>Significant modification of the resuscitation medication calculator</td>
</tr>
<tr>
<td>Whole Organisation</td>
<td>Systemically inadequate knowledge regarding the use of intra-osseous infusion devices</td>
<td>Education program provided</td>
</tr>
<tr>
<td>ED and inpatient wards</td>
<td>CPR backboard availability and location found to be unideal in ED and wards</td>
<td>More backboards sourced and positioned on resuscitation trolleys</td>
</tr>
<tr>
<td>ED</td>
<td>Method of fluid administration in ED was found to be systematically inadequate</td>
<td>Fluid delivery methodology modified and education program instigated</td>
</tr>
<tr>
<td>ED</td>
<td>ED resuscitation bay layout hindered effective resuscitation</td>
<td>Layout modified and then tested using simulation</td>
</tr>
</tbody>
</table>
In addition, as simulation activity has increased, changes in how clinical events are managed have been noted. A number of external clinicians and other observers have commented on improved communication, better event management, better following and better use of resources. We have also noticed increased and improved use of debriefing following real crisis events. This has served to improve staff morale, improve staff learning and improve the Starship systems. The debriefing used in these situations uses the principles and system that the Starship simulation instructor course has taught.

When this training occurs routinely in the usual place of work (in-situ) not only do better teamwork behaviours become the norm, there is opportunity to critically analyse the clinical environment, systems and processes to improve patient safety by removing latent safety threats.

References:

PO 08-1 - Moving To A New Hospital: Two Types Of InSitu Simulation For Or Staff Preparedness
Process improvement and organizational change
Submission ID: IPSSW2017-1167

Chantal Hickey1, Sandra Lesage1, Françoise Yung1, Myriam Couture1, Caroline Haché1, Stephanie Hogue2, Hayli Martinez2, Andree Sansregret2
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Context:
Moving into a new hospital represents a major challenge for medical teams: a new work environment with new equipment and new work procedures. Recent publications have described the use of simulation to test this transition, helping to detect and correct latent threats prior to moving patients (1-2). Furthermore, simulation can be used to allow medical teams to develop a sense of understanding of their new environment thereby minimizing the impact, both physical and psychological, of the additional workload (3). These two aspects of simulation were used in preparing our OR staff (a mother-child university affiliated center) to move into a new adjacent building in 2016.

Description:

<table>
<thead>
<tr>
<th></th>
<th>SIM BUS</th>
<th>SIM OBST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>InSitu Medium Fidelity</td>
<td>InSitu High Fidelity</td>
</tr>
<tr>
<td>Main goals</td>
<td>Staff preparation</td>
<td>security</td>
</tr>
</tbody>
</table>

161
Observation: All the departments involved were asked to come up with projects which would help their teams in the transition. Because of construction constraints, the deployment of these activities could only be carried out in the last months before the big move. This led to a pragmatic distribution of limited resources (high vs medium fidelity and personnel attribution).

The buy in for these activities was facilitated by the proximity of the new building and by the fact that simulations were done during regular working hours. Both projects, were useful in identifying latent safety threats and allowing the personnel to evaluate the workflow (functionality and ergonomy) in their new workplace. This allowed the teams to either correct the problems or find new ways of solving them before the move. The scenarios and debriefings for the SIMBUS project were mandatory and done on site, so that all the staff was given an opportunity to test, question and comment the workflow. In the SIMBUS satisfaction survey, the majority responded that these simulations would help them in the transition.

Discussion: In the absence of a measurable goal, it will not be possible to demonstrate the benefit of the SIMBUS to decrease the stress and the workload associated with the move into a new hospital. SIMBUS has been a team building experience and by creating an interest for in-situ simulation, we hope to have prepared the field for future interprofessional education simulation projects in the OR setting. The SIMBUS and SIM OBST experience showed different but complimentary ways of including simulation to prepare for the transition into a new environment. Both provided key elements for system and workflow testing to improve future patient safety. By improving staff preparedness, we believe we also improved patient safety forming a team prepared to work together towards a same goal.

References:

Disclosure of Interest: None Declared
Research Question: Our study aims to evaluate the current literature on medical student perspectives towards SBT and establish if SBT should be included in the Imperial College London curriculum.

Methodology: We conducted a literature search using Ovid in three databases, combining search terms ‘Simulation’, ‘Medical student’ and ‘Paediatric’. 39 relevant titles were identified and the results analysed by two independent reviewers. Year 5 medical students on their paediatric placement at a teaching hospital attended a small group SBT session involving the use of high-fidelity mannequins simulating common acute paediatric scenarios. Evaluation forms were provided to the students after the sessions, to assess their willingness to engage with SBT, what specific aspects of SBT were useful, and their opinions on integrating SBT as part of the paediatric core curriculum.

Results: Our literature search highlighted positive student perspectives supporting the use of SBT in medical education, however, its role in improvement of clinical outcomes and short-term knowledge has been disputed. 23 students completed our feedback form, with participants stating that simulation was an effective tool in identifying knowledge gaps and improving the traditional lecture based curriculum. All participants agreed SBT should be included in the curriculum, and comments stated that it was a novel method of learning compared to other teaching sessions. Students identified that the simulation sessions improved their communication skills, whilst enabling them to apply knowledge in highly pressured situations with an increased sense of responsibility.

Discussion: We have demonstrated a gap in the teaching curriculum and shown an overwhelming positive student response to SBT. It is not currently used in all Imperial College London affiliated teaching hospitals, but our study suggests students will benefit from its inclusion. Multiple sessions should occur per rotation, concluded by individual feedback. SBT successfully allows the application of theory from lecture-based teaching, and brings students closer to experiencing real clinical scenarios. Further research is required to evaluate the effect of medical student simulation on paediatric clinical outcomes, reducing errors in clinical practice and academic performance in students.

References:

Disclosure of Interest: None Declared

PO 08-3 - Welcome To The College Of Nursing: You've Just Been Simulated

Process improvement and organizational change
Submission ID: IPSSW2017-1185

Maureen Hillier1, 2, 3, Christine McGrane1, Beth Anne Jalbert1, Todd Madison1
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Context: During their first year of coursework, nursing students can feel isolated and disconnected from the college of nursing in large university programs. Nursing programs continue to experience an increase in student enrollment, faculty shortage and limited budgets. Educators and administrators continue to search for teaching strategies that are innovative and efficient. Simulation has been shown to be an effective teaching modality (Hayden, Smiley, Gross, 2014) however it is costly in terms of materials and human resources to run. Research has demonstrated improved learning outcomes when students are actively engaged in gaining knowledge through experience with problem solving, decision making and active reflection (Dewey 1938; Kolb, 1984).
Description: While maximizing the use of our limited resources, we found a creative way to integrate simulation during the first eight weeks in a BSN program. The University 101 introductory seminar is intended to assist in the transition to college, promote academic success and introduce students to their intended major course of study. Five classes of 25 nursing students were offered a tour of the pediatric simulation lab and an additional unscripted learning experience when a mother and infant child quietly walked into a back corner of the simulation lab. Student responses to the mom were observed from the control room. The simulation experience included a planned debriefing session.

Observation/Evaluation: Freshmen nursing student reactions varied based on response time and to the simulation itself. Many had prolonged periods of uncertainty and after 7 minutes, one group did not approach the mother at all. During the debriefing session a theme that commonly emerged across the five student groups was initiating the first and most important step of the nursing process: assessment. While this was a fun and engaging learning experience, the initiative was successful in simultaneously incorporating satisfaction and confidence to perform well academically in order to enter the discipline of nursing. Other participants stated they were motivated to return to the simulation lab. During the last phase of debriefing, students concluded that the unscripted experience taught them to pay attention to detail, promptly address a problem when uncertain and to work together as a team.

Discussion: Students described this as a transformational learning experience that laid the groundwork to understand nursing and the nursing process. Students gained a sense of role clarity on their journey to becoming a nurse. Offering 125 nursing students at a large university a one hour tour and simple unscripted simulation learning experience with structured debriefing is an innovative and efficient way to welcome freshman students into the discipline of nursing.

References:

Disclosure of Interest: None Declared
Description: CNBCN encompasses 13 sites. The project started with a primary outcome of: “Improve the ability of NRP instructors to teach effectively by 50% within 12 months”. Fishbone and Driver diagrams were developed and utilized to support the building of a survey. The survey was designed to provide baseline data on the existing delivery of NRP education as well as identify specific areas to target for this QI initiative. A large focus of this survey centered on: 1) the education of instructors in simulation facilitation and debriefing; 2) the availability of resources; and 3) feedback from providers on the quality of their NRP instructors.

Observation/Evaluation: The survey was distributed to all CNBCN sites as well as to all providers who were responsible for caring for newborns in the delivery room. Survey respondents totaled 450. Survey responses provided the following feedback: 1) NRP Instructors responded that only 78% of NRP courses were interprofessional; 2) 24% of instructors did not have any training in simulation facilitation and debriefing; 3) 17% of instructors have “passed” a student who they felt did not perform adequately; 4) Providers only rated 63% of their instructors as being very good in their teaching skills; 5) only 52% of sites do simulations outside of NRP courses; and 6) doing more frequent simulations was the most frequent suggestion by survey respondents for improving NRP education.

Discussion: Several areas were identified for focusing initiatives to help improve NRP instructor efficacy and ideally learner outcomes. The next step is to engage a larger workgroup of NRP Stakeholders at each site to address these improvement opportunities using the IHI Model for Improvement framework, and where applicable, LEAN principles. This is a novel use of QI methodology to improve a simulation based educational program.

Image:

Disclosure of Interest: None Declared

PO 08-5 - Building A Culture Of Simulation In A Paediatric Emergency Department  
Interprofessional Education (IPE)  
Submission ID: IPSSW2017-1176

Jane Cichero, Linda Durojaife, Nichola Concannon  
1Emergency Department, Sydney Children's Hospitals Network Randwick, 2Emergency Department, Sydney Children's Hospitals Network Randwick, Sydney, Australia
Context: Simulated learning environments (SLE’s) have become integral to many education programs in healthcare today. Since 2014 the Sydney Children’s Hospital Emergency Department (ED) has supported nursing and medical simulation lead positions to facilitate the development of a simulation education program to support learning in the ED and inform practice. Simulation and skills training cover areas that span from the care of critically ill or injured children, triage and advanced nursing practice, challenging conversations, communication and leadership. Operational issues and latent errors have been discovered as a result of the SLE’s. This has led to improved patient safety through the quality improvement cycle by addressing and resolving latent errors and operational issues.

Description: Our comprehensive ED Simulation program includes multidisciplinary in-situ scenarios, multidisciplinary one day team training courses, triage, advanced nursing practice and clerical scenarios, clinical skills teaching, faculty training and mentoring, and senior ED staff communication and challenging conversation scenarios. Latent errors and knowledge gaps revealed during any of these sessions are recorded in a database and tabled at the ED Quality and Safety Committee. In addition, any significant clinical incidents inform the development of new systems or tools which are tested and rehearsed in SLE’s.

Evaluation: Evaluations utilise a 5 point likert scale with free text option have been extremely positive across all aspects, the majority indicating scores in the two highest bands. Defined quality data has been measured and include a reduction in reported clinical incidents in medication errors during resuscitation and reduced time taken to prepare rapid sequence induction medications. Patient safety initiatives have been developed e.g. access for theatre staff to the electronic resuscitation drug calculator, development of a massive transfusion protocol. Faculty training and a mentoring model has widened the pool of skilled simulation educators resulting in a sustainable workforce to support a culture of simulation in ED.

Discussion: The ED simulation program has provided a positive impact on the culture and safety in our ED. The SLE’s are consistently used to inform practice, develop and check clinical tools and systems and improve care for patients and families in the ED. Ongoing feedback through the quality cycle continues, further improving and refining these tools/systems. After two years there is a perceived difference in staff attitude to simulation, with regular requests for inclusion in future SLE events, a testament to the value staff now place on this type of learning, demonstrating that faculty have been successful in creating a safe learning environment for all.

References:

Disclosure of Interest: None Declared

PO 08-6 - Introducing Team Performance In Malawi’s Pediatric Emergency Triage Assessment And Treatment Course
Interprofessional Education (IPE)
Submission ID: IPSSW2017-1058

Elaine L. Sigalet1, Ian Wishart2, Norman Lufesi3, Faizal Haji4, Adam Dubrowski5
Context: Training healthcare professionals to engage concepts of effective team performance is important to ensuring patient safety (Aggarwal et al., 2010; Manser, 2009; Nieva & Sorra, 2003). Yet in developing countries, where child mortality remains very high in children under 5 this is not prioritized. Inherent challenges such as limited time for education due to excessive demands of clinical practice results in a sole focus on taskwork. Leadership, role clarity, communication, mutual support, and resource utilization were the concepts identified in the objectives of this learning activity.

Description: To introduce concepts of team performance we included a team learning activity during a 2-day train the trainer (TTT) course. On each day a 5-10 minute team activity was followed by a 20-25 minute facilitated discussion. On day one participants were assigned to one of four teams ensuring interdisciplinary representation from nursing, clinical officers and physicians. Teams were asked to complete the build of a 20-piece puzzle, where two pieces of each puzzle were purposely redistributed to another teams puzzle box. The learning objective was “to build your puzzle working as a team” in 10 minutes. On day two the teams were asked to build the longest paper chain possible in 5 minutes using plain white/colored/recycled paper, scissors and scotch tape.

Observation/Evaluation: All participants wanted to succeed and were frustrated by the short timeline. Only half of the participants were familiar with building puzzles. Participants required prompting by faculty to identify and discuss teamwork. Team members functioned in isolation of each other with puzzle activity, which probably reflects frequent practice in developing countries due to limited personnel. Other observed behaviors from day one included a very loud environment with all team members talking often at the same time. Lack of role clarity and challenges with critical thinking over solving missing puzzle pieces provided a great context for discussion of role clarity, communication, and resource utilization. There was a huge improvement in application of teamwork concepts in learning activity on day two suggesting it is possible to expand education focus to include teamwork.

Evaluation: Learning activities focused on effective team performance may take longer in a developing country where concepts/activities are new and task is not familiar. We needed double the allotted time and found that valuable to participant learning. On the fly adaptation is important to ensure completion of the objective to provide a context for discussing successful teamwork strategies. Challenges are always easier to discuss especially when concepts are novel and activity is not familiar. We weaved teamwork concepts throughout the course and added a learning objective in all scenarios to reinforce importance of concepts.

References:

Disclosure of Interest: None Declared
Context: Resuscitation of pediatric patients is complex and can be challenging for both novice and experienced health care providers. Communication barriers and poor interprofessional team dynamics may compromise resuscitation efforts. Although a number of simulation-based programs have been developed for PICU fellows and pediatric residents, few involve a multidisciplinary approach. We describe the development and implementation of an interprofessional team training program in a PICU that includes PICU fellows and residents, nursing, pharmacy, respiratory therapy, and anesthesia residents.

Description: The in-situ team training occurs weekly in the PICU. Simulation equipment consists of SimBaby or SimJunior (Laerdal Medical, Stavanger, Norway). Patient care tools include intravenous and intraosseous access, standard airway equipment, and a defibrillator. In the event of a simulated cardiopulmonary arrest, the code cart is brought into the room and code medications are drawn up and administered as needed. Details of the resuscitation are recorded in the Code Narrator of the electronic health record. Each twenty minute scenario is followed by a 40-minute debriefing focused on medical management and principles of crisis resource management.

Observations: The interdisciplinary training has been beneficial to both pediatric and anesthesia trainees. A cardiopulmonary arrest is a rare event in the Pediatric ward or PICU, but it is more infrequent in the operating room. Since many of the simulated team training sessions present a scenario involving cardiopulmonary arrest, this training enables the anesthesia trainees to practice resuscitation skills, to gain exposure to complex pediatric illnesses, and to manage situations that do not commonly present to the operating room. This is reinforced by the fact that the anesthesia trainees are asked to refrain from assuming the role of the airway manager. The pediatric trainees are able to further improve their airway management skills as a result of the anesthesia resident’s presence. In cases in which airway management was challenging, anesthesia trainees provided helpful suggestions during the scenario then discussed their thought process and demonstrated airway skills on the mannequin during the debriefing. These inter-disciplinary peer interactions enhanced the learning process and complemented the education facilitated by the faculty.

Discussion: Our observations highlight the feasibility and benefit of interdisciplinary training involving anesthesia and pediatric trainees, in which they participate in a simulated clinical crisis in the PICU. The educational benefits include increasing opportunities to acquire skills in the management of pediatric illnesses and of airway challenges, the expansion of the peer teaching and learning, and the conservation of resources by utilizing the time and equipment involved in setting up one scenario to benefit two groups of trainees.

References:

Disclosure of Interest: None Declared
was founded in October 2013. Curriculum integration started with the medical faculty and continued with nursing school followed by other vocational schools of our university.

Research Question: Curriculum integration of simulation based education in pediatrics began this year. In a simulation program for pediatric emergencies, we asked the participants to answer a questionnaire on the presented education material, their motivation to participate and their opinion on this program.

Method: An IMMS questionnaire consisting of 36 items with a 5 point Likert scale was handed to the participants to assess their level of motivation. The questionnaire investigated four factors consisting of participant’s attention, relevance, confidence and satisfaction according to Keller’s motivational design theory. There were 9 items each for relevance and confidence factors, 5 items for the satisfaction factor and 12 items for the attention factor on the questionnaire. To assess the participant’s opinion about the simulation program we also used another 4 point Likert scale questionnaire including 22 items. In this qualitative study we evaluated the opinion of 24 participating students.

Results: Students participating in this study stated that simulation based training accompanied by an educator is enhancing knowledge and skills (%100) and leading to a better understanding of positive effect of teamwork and communication skills on clinical outcome (% 79), that video recording gave them the opportunity for better self and peer evaluation (%79) and that simulation based training should be a part of their regular education program. In evaluation of the presented education material, students stated that the education material used in the simulation program is attractive (4.36 mean) and the education is supporting their self-esteem (4.22 mean) that the program content and the course material were related to real life situations ( 4.63 mean), that the experience gained through the course content and the scenarios within the education were satisfying. (4.78 mean)

Discussion: The simulation program for pediatric emergencies adjunct to the regular education program of medical students is important in terms of their professional development by helping the participants to gain self-esteem and improving their practical skills.

Image:
<table>
<thead>
<tr>
<th>Instructional Materials Motivation Survey</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Item related to the confidence factor (I strongly disagree, 5 strongly agree)</td>
<td>4.22</td>
</tr>
<tr>
<td>when I first saw the course content, I thought I would find it on my own</td>
<td>3.0</td>
</tr>
<tr>
<td>This video and text were not as difficult to understand as I thought they would be</td>
<td>4.2</td>
</tr>
<tr>
<td>Following the presentation of information, I felt sure that I would be able to learn on this course</td>
<td>4.6</td>
</tr>
<tr>
<td>I was not too much information and so it was not difficult to recall the most important points</td>
<td>4.6</td>
</tr>
<tr>
<td>As I was managing the patient though the scenario, I felt sure that I did learn from content</td>
<td>4.7</td>
</tr>
<tr>
<td>After practicing the scenario, I felt sure that I could manage the same patient in clinical situation</td>
<td>4.1</td>
</tr>
<tr>
<td>I understood most of the protocol approach to the patient who was asked to be managed in the scenario</td>
<td>4.2</td>
</tr>
<tr>
<td>The scenarios were well organized, which gave me the confidence to believe I could learn from them</td>
<td>4.5</td>
</tr>
<tr>
<td>Items related to the satisfaction factor (I strongly disagree, 5 strongly agree)</td>
<td>4.75</td>
</tr>
<tr>
<td>I enjoyed this training course and having the opportunity to be performing in the scenarios</td>
<td>4.9</td>
</tr>
<tr>
<td>I really enjoyed participating in this training course</td>
<td>4.5</td>
</tr>
<tr>
<td>The content I received on completing an exercise on during performance made me feel that my hard work had been worth it</td>
<td>4.5</td>
</tr>
<tr>
<td>I feel good about having completed the training: course satisfactorily</td>
<td>6.8</td>
</tr>
<tr>
<td>It was a pleasure to attend such a well-designed training course</td>
<td>5.2</td>
</tr>
<tr>
<td>Items related to the decision factor (I strongly disagree, 5 strongly agree)</td>
<td>5.65</td>
</tr>
<tr>
<td>For me, the content of video and text were clearly related to things I should know</td>
<td>6.0</td>
</tr>
<tr>
<td>Video and texts send me before the training course showed me that it would be important to understand demonstrations and clinical decision on the scenarios</td>
<td>0.6</td>
</tr>
<tr>
<td>Completing the simulation training course satisfactorily was important to me</td>
<td>4.7</td>
</tr>
<tr>
<td>The content of simulation training material is relevant to my personal interests</td>
<td>4.7</td>
</tr>
<tr>
<td>Demonstrations and case scenarios gave me the impression on how to use the knowledge and skills acquired in professional life</td>
<td>4.8</td>
</tr>
<tr>
<td>This training course was relevant to my needs and I learned a lot in this course</td>
<td>4.8</td>
</tr>
<tr>
<td>I use the course content to things I can see in my professional life</td>
<td>4.2</td>
</tr>
<tr>
<td>The training course content will be useful for me</td>
<td>4.2</td>
</tr>
<tr>
<td>For me, the content of video and text were clearly related to things I should know</td>
<td>5.0</td>
</tr>
</tbody>
</table>

References:
Disclosure of Interest: None Declared

PO 09-2 - Low-Fidelity Medical Simulation In Southwest Alaska: A Needs Assessment

*Simulation Instruction design and curriculum development*

Submission ID: IPSSW2017-1054

Elizabeth Sanseau¹, Jennifer Reid², Anita Thomas³

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**Background:** Rural medical providers working at the Yukon-Kuskokwim Health Corporation (YKHC) in Bethel, Alaska face numerous challenges. They attend to pediatric emergencies, travel to outlying villages for high-risk deliveries, and care for complex pediatric patients. Barriers to healthcare include: resource limitations, service access and training constraints.[1] One solution that addresses training constraints is simulation.[2] [3]

**Objective:** A needs assessment of providers working at YKHC was conducted to develop instructional goals, training curricula, and assessment metrics for a low-fidelity simulation program.

**Methods:** YKHC medical team members (MDs, DOs, RNs, RTs, Pharmacists, Health Aides) completed an anonymous online survey through REDCap electronic data capture tools, hosted at the University of Washington.[4] Participants identified procedural and simulation scenarios to practice. Procedural options were casting/splinting, intravenous (IV) vascular access, intraosseous (IO) vascular access, intubation, laceration repair, lumbar puncture (LP), nasogastric (NG) tube placement, or other. Medical scenario options were anaphylaxis, neonatal resuscitation, overdose, respiratory distress, seizure, or other. Respondents identified barriers to incorporating simulation. Descriptive data analysis was completed for both quantitative and qualitative responses.

**Results:** Twenty-six of thirty (86%) medical team members completed the survey, 50% of whom were physicians. Six of 26 respondents (23%) reported simulation is already incorporated into their practice. Of the 6 who have participated in simulation, 100% participated in resuscitation, 83% in teamwork/communication, 50% with procedures, and 16% in other. Twenty respondents identified integration barriers: lack of resources (65%), lack of an established curriculum (65%), lack of faculty to facilitate the simulation (50%), and lack of institutional support (50%). Of all 26 responses, the following uses were requested: teamwork/communication (92%), resuscitation (85%), procedures (65%), mobilizing outside resources (54%). Respiratory distress and intubation were ranked as the highest simulation and procedure priorities to practice, respectively.

**Conclusions:** Providers caring for the pediatric population in Bethel, Alaska desire simulation-based education in teamwork/communication, medical scenarios focused on respiratory distress and intubation. The most common barrier reported was lack of curriculum and lack of resources. Next steps are to use this information to inform key design elements for a simulation-based educational program.

**References:**


Disclosure of Interest: None Declared

PO 09-3 - Using Simulation To Identify Latent Safety Threats During Neonatal Intramural MRI Transport
Jonathan Wong¹,³, Kaarthigeyan Kalaniti¹,³, Michael Castaldo¹,³, Kyong-Soon Lee¹,³, Hilary Whyte¹,³, Manohar Shroff ⁴, Douglas M Campbell¹,²,³

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Background: In-situ simulation can be described as ‘simulation that is fully integrated with clinical operations, people, information, technology, and systems’. This method of inquiry can be used to identify latent safety threats (LSTs) for patients. Magnetic resonance imaging (MRI) is a frequently used imaging modality but is remotely located from most neonatal intensive care units (NICUs) and can put patients at risk. Our aim was to use simulation to identify LSTs during neonatal MRI transport and to improve transport processes.

Methods: A prospective observational study was conducted at the Hospital for Sick Children (REB approved). Experienced transport personnel were recruited to participate in scripted simulation scenarios. Simulated ‘runs’ consisted of taking a neonate with hypoxic brain injury (MRI-compatible low-fidelity manikin) down to the MRI suite and back in real-time. Data was obtained through self-reporting and direct observation. LST checklists and validated work load indexes were collected.

Results: Ten simulated MRI transports were completed. Four were completed by dedicated transport teams, 3 by scheduled intramural teams (intramural RN & transport MD) and 3 by ad-hoc teams (RT, RN, and/or MD). 17 of 22 participants had >12 months of transport experience. 3 of 10 runs were in intubated patients. The most commonly identified LSTs included: lack of anticipation of clinical deterioration in an unfamiliar location and medication error. Medication-related hazards included: anticipation of medication need, errors in dose verification and administration. Common environmental threats included: confusion around equipment and where to resuscitate the patient once in the MRI suite. Differences in checklist performance were noted between dedicated transport teams and others. Clinicians reported increased mental & physical workload irrespective of patient acuity or years of experience.

Significance: In-situ simulation was able to identify a number of significant LSTs during neonatal MRI transport, with variation amongst different team configurations. Strategies are in development for process improvement.

PO 09-4 - NICU Multidisciplinary CRM Seminars in Graduate Education: Delivery of Difficult Information

Crisis Resource Management/Human factors and Teamwork

Submission ID: IPSSW2017-1226

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Abstract Body: Death of a child may be the most traumatic event in medicine for both families and multidisciplinary health care professionals (MDHCPs).¹ Anticipated or unexpected, a neonatal death has a profound effect on the novice or experienced clinician. Boston Children’s Hospital (BCH) Neonatal Intensive Care Unit (NICU), a 24 bed Level IV ECMO-ready tertiary referral center with >500 admissions/year, accepts infants from the United States and internationally with complex diagnoses. The MDHCPs with diverse training provide coordinated care. Some infants do not survive. With impending death of an infant, comes the responsibility of informing the parents, providing ongoing medical and psychological support, while demonstrating compassion. Conveying grave information is difficult and requires training. The ABCDE model (Advance preparation; Building a therapeutic relationship; Communicating well; Dealing with patient and family reactions; Encouraging/validating emotions) can be a framework.²
The death of an infant has a devastating effect and will be remembered. Appropriate communication can improve long-term well-being of family and demonstrate the life was valued. Unified teams capitalize on effective, coordinated technical/behavioral skills of communication, leadership, decision-making, and task assignment. The BCH NICU Staff Needs Assessment identified educational practice gaps: HCPs felt inadequately prepared for aspects of death both personally and professionally. We developed a CRM curriculum to prepare the MDHCP team with tools for effective communication during death of an infant.

**Question:** Does utilization of a NICU End-of-Life Tool Kit for delivery of difficult information during a NICU multidisciplinary, high-fidelity simulation scenario improve 1) MDHCP self-reported comfort and confidence in the ability to deliver difficult information; and 2) MDHCP ability to complete steps in the ABCDE model by comparison of scores on pre and post-course questionnaires?

**Methodology:** The BCH NICU CRM course provides HCPs with technical/behavioral skills to improve communication and teamwork which extends to clinical practice. Didactic: CRM principles and ABCDE model for relay of difficult information Scenario 1: Infant code with parent actors. Debriefing by NICU Simulation Team and PERCs (Program to Enhance Relational and Communication Skills) facilitators Scenario 2: MDHCT relays difficult information to parent actors

**Results:** Pre course survey: MDHCPs believed it was challenging to work with dying patients and did not feel prepared to communicate with families. Post course survey: 100% of MDHCP respondents cared for a dying infant within the post 6-12 months and reported they learned effective communication strategies, translatable to clinical practice.

**Discussion/Conclusions:** Surveys support benefit from the skills session and learning strategies which helped provide comfort and confidence to deliver difficult information to families.

**References:**

**Disclosure of Interest:** None Declared

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**PO 09-5 - Can Self-Assessment Replace Expert Evaluation Done By Faculty Members In Simulation Training?**

**Topic: Simulation for procedural and psychomotor skills**

**Submission ID:** IPSSW2017-1082

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**Background:** Accurate assessment is imperative for learning, feedback and progression. Simulation training combined with videotape recording of the performances and consecutive debriefing gives participants the opportunity to evaluate and self-assess their own performances. Previous studies on the accuracy of self-assessment concluded with rather controversial results. (1,2)

**Research question:** The aim of this study was to investigate whether experienced staff-nurses in neonatal intensive care units of a private hospital chain can self-assess their technical skills performance as accurate as an expert faculty member.

**Methods:** Eighty-eight experienced nurses performed neonatal resuscitation in a simulated delivery room. They were videotaped during their simulation session. A debriefing with a faculty member was performed thereafter. Participants were asked to self-assess their technical skills performances after debriefing using a pre-prepared
checklist. Their performances were also assessed by faculty members independently using the same checklist prepared according to 2015 AHA Neonatal resuscitation guidelines using the Delphy method.

**Results:** Self-assessment scores of the participating experienced nurses, done after reviewing of their videotaped own performances and debriefing with a faculty member did only weakly correlate with the assessment done by faculty members.

**Conclusions:** Self-assessment of technical skills in simulated environment even after debriefing does not replace an expert evaluation done by a faculty member. If assessment is required, an expert evaluation is still necessary at the end of simulation training.

**Image:**

![Image](image.jpg)

**References:**

1. MacDonald J., Williams G., R., Rogers A., D., Self assessment in simulation-baded surgical skills training, Presented at the 22nd Annual Meeting of the Association of Surgical Education, Baltimore, Maryland, April 4-6, 2002.


**Disclosure of Interest:** None Declared
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**Context:** Managing Emergencies in Paediatric Anaesthesia for Trainees (MEPAT) is an internationally recognised, peer reviewed and literature based simulation course which aims to give anaesthesia trainees the opportunity to develop skills in the management of paediatric anaesthetic emergencies (1). Anaesthetic training in the UK is competency based with a minimum of 60 individual assessments and 20 ‘Units of Training’ required to be signed off for completion of Intermediate training alone (2).

**Description:** Previous work has mapped the MEPAT course to the Royal College of Anaesthetists UK (RCoA) coded competencies to create a curriculum map (3). Following positive feedback from trainees using this curriculum map we had requests to embed Work Place Based Assessments into the MEPAT course - we piloted the use of standardised Case Based Discussion (CBD) templates. We reviewed learning objectives (LO’s) within the MEPAT scenarios alongside our local MEPAT database of ‘Take Home Messages’ (THM’s) - reported learning outcomes from course participants following each structured debrief. THM’s matched the LO’s set out for each scenario and were consistent across all courses. Following this analysis we felt confident that our MEPAT debriefs or ‘simulated case based discussions’ were standardised – allowing us to create a CBD Template for each scenario using the THM’s as core themes for discussion. The template could then be easily transferred to the RCoA electronic portfolio.

**Observation/ Evaluation:** Feedback from trainees and specialist paediatric anaesthetists has been extremely positive. It has allowed trainees to sign off several different competencies within one MEPAT scenario and has provided the assessor with a template to work from therefore minimising the substantial workload required to complete each CBD.

**Discussion:** We hope that our work in both curriculum mapping and CBD templates can be used by the RCoA as a model for embedding simulation into the anaesthetic training curriculum.

**References:**
1. [www.mepa.org.uk](http://www.mepa.org.uk)

**Disclosure of Interest:** None Declared

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**PO 09-7 - Pediatric Simulation Training For Prehospital Providers In Botswana**

*Simulation Instruction design and curriculum development*

Submission ID: IPSSW2017-1154

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**Background:** Prehospital medicine is new in Botswana and many other developing nations. Prehospital care in Botswana began in 2012 in response to concerns with motor vehicle collisions and other prehospital emergencies, especially in pediatric patients. The Ministry of Health (MOH) identified a need for further training, particularly for pediatric resuscitation, and requested external collaboration.

Simulation-based training programs effectively develop clinical knowledge, procedural skills, teamwork and communication. Previously, simulation-based training for prehospital providers has been effective in resource-
rich settings. Participants demonstrated improvement on post-test scores, high levels of satisfaction, confidence, and improved protocol compliance after training.

Currently, there are no published reports of simulation based education for prehospital providers in resource-limited settings. We sought to develop, implement, and evaluate a simulation-based curriculum for prehospital providers in a resource limited setting.

**Research Question:** Will a pediatric prehospital simulation-based training program in Botswana improve post-test knowledge and simulation-based performance?

**Methodology:** Based on a needs assessment and feedback from MOH leadership, we developed a simulation curriculum focused on high frequency and acuity pediatric calls, including trauma, respiratory emergencies, seizures, shock, and newborn deliveries. The curriculum included didactic lectures (introduction to simulation, resuscitation, newborn, and trauma), skills training (peripheral intravenous line/intraosseous placement, airway, cardiopulmonary resuscitation, newborn delivery, backboard and splinting) and simulation scenarios using rapid cycle deliberate practice. Baylor College of Medicine staff, in collaboration with the Botswana MOH, provided three two-day trainings for 31 prehospital providers. Four prehospital staff identified by the MOH received special instruction to become trainers. Trainees completed written and videotaped simulation tests, as well as self-efficacy surveys, before and after the course.

**Results:** The mean scores for simulation and written pre-tests were 56% and 75%, respectively. The mean scores for simulation and written post-tests were 78% and 86%, respectively. The mean score for the simulation increased by 22% from the pre- to post-test, while the mean score for the written test increased by 11%. This difference was statistically significant for both the simulation and the written test (p <0.0001).

**Discussion/Conclusion:** After completing a two-day simulation-based training program, prehospital providers showed a statistically and clinically significant increase in performance on written tests and simulated performances. While this curriculum was specifically designed to address the most common chief complaints among pediatric EMS calls in Botswana, it may be adapted for use in other areas with similar presenting complaints and resources.

**References:**

1. Laba, B. Director, Emergency Medical Services, Botswana Ministry of Health, oral communication.

**Disclosure of Interest:** None Declared
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Context: Simulated exercises are now used widely for education and evaluation in the medical profession (1). There is increasing evidence to suggest that high quality, high fidelity simulation is an effective and desirable teaching method for students. Simulated scenarios are beneficial to both students and patients, as they protect both realism and enhance patient safety (2). Currently, at The University of Glasgow, the focus has been primarily on adult-based scenarios. The aim of our pilot study was to evaluate the experiences of medical students taught on three standardised paediatric scenarios over two afternoons.

Description: We generated three new paediatric scenarios, based on common emergencies: anaphylaxis, bronchiolitis and meningococcal sepsis. All students doing their child health block, during October-November (2016), were invited. Students worked individually or in pairs to complete the exercise. After the scenario, the group was debriefed and micro teaching delivered. The ‘Satisfaction with Simulation Experience Scale’ was used to gauge the students’ experiences (3). Each of the 18 items were scored from 1 ‘strongly disagree’ to 5 ‘strongly agree’ as well as an opportunity to provide additional freehand comments.

Observation: Of the 36 students invited to participate, 11 (31%) responded and agreed to take part. The maximum and minimum scores for each of the 18 items was 5 ‘strongly agree’ and 4 ‘agree’ respectively. The median and mode for each of the 18 items was 5.5 (45%) of the students rated ‘strongly agree’ for all of the feedback questions. 1 (9%) of the students rated ‘agree’ for each of the 18 items. 10 (91%) of the students rated ‘strongly agree’ that it was a ‘valuable learning experience’ and 9 (82%) rated ‘strongly agree’ that it ‘developed their clinical decision making skills’. 8 (72%) gave free text comments. Comments included: ‘very useful’ (2), ‘great experience’ (2), ‘really useful’ (1), ‘enjoyable’ (1), ‘fantastic session’ (1) and ‘very good session’ (1).

Discussion: It was clear that the students found the scenarios very useful. The lowest rating given for any item was 4 ‘agree’. Almost half of the students rated 5 ‘strongly agree’ for every feedback question. The free text comments further highlighted their satisfaction with the sessions. We identified several challenges with our simulated exercises. It was apparent that each scenario took one hour to prepare and deliver. This would pose a significant resource burden in order to sustain a faculty to train 250 undergraduates per annum. In conclusion, we demonstrated that paediatric simulation is an effective and desirable teaching tool for medical students. It remains to be seen whether there are sufficient resources to allow for these scenarios to be incorporated into the undergraduate curriculum in the near future.

References:

Disclosure of Interest: None Declared

PO 10-2 – Assessment of a Novel Pediatric Resident Simulation Curriculum

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Background: Many pediatric residency programs incorporate high-fidelity simulation into their curriculum, but there is limited data discussing the utility/educational impacts of a longitudinal/standardized/multimodal simulation curriculum. Several studies of simulation-based training have employed “self-efficacy” as a barometer for trainee education and performance. The level of a person's self-efficacy can influence their behavior and may be a pivotal factor in performance. We have implemented a newly devised standardized, multimodal resident simulation curriculum (Figure 1) and used resident self-efficacy to assess its effectiveness.

Aim: To assess the efficacy of a newly implemented resident simulation curriculum at a medium sized pediatric residency program.

Methods: Participants were UMass Pediatric and Med/Peds residents. Implementation of our curriculum occurred at the start of the 2016-2017 academic year. Surveys were administered to all residents prior to curriculum implementation and at 6 months post-implementation. They assessed resident self-efficacy with regards to specific technical/procedural skills (i.e. running a code, performing intubation, etc.) and resident confidence in their ability to identify/manage specific pediatric disease presentations (i.e. respiratory failure, tachyarrhythmia, etc.). Data was pooled and averaged for each resident class separately. We determined a 10% change in self-efficacy to be a clinically significant difference.

Results: 36 of 40 residents completed the initial survey and 31 completed the 6-month follow-up. PGY1 residents reported improved self-efficacy for 4 PALS-related skills and 8 pediatric case presentations (Table 1). Similarly, PGY2 residents reported improved self-efficacy for 3 PALS-related skills and 6 pediatric case presentations (Table 1) (Figure 2). Conversely, PGY3/4 residents reported no significant change in self-efficacy for any survey question.

Conclusions: These results suggest that our newly implemented longitudinal, standardized, multidisciplinary, multimodal simulation curriculum has significantly improved resident self-efficacy related to core PALS skills/topics, with the greatest impact affecting our PGY1 class. Further study and curriculum development will attempt to address this issue.

References:

Image:
**PO 10-3 – Procedural Training And Competency Assessment For Pediatric Emergency Medicine Physicians**

*Simulation for procedural and psychomotor skills*

Submission ID: IPSSW2017-1214

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**Background:** Many procedures identified by the Accreditation Counsel for Graduate Medical Education as essential to the practice of pediatric emergency medicine (PEM) are rarely performed by PEM physicians.¹ Physicians feel that their opportunities for procedural practice are inadequate.² There are currently no procedural training or procedural competency guidelines for PEM attendings.

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**UMass Pediatric Simulation Curriculum**

- BLS/PALS (every 2 years)
- Skills Sessions (monthly)
- NICU/PALS Boot Camps (biannual)
- Integrated lecture/high-fidelity Simulation Sessions (monthly)
- In-Situ Floor/PICU Mock-Codes (weekly)
- Multidisciplinary Crisis Resource Management (Mega-Codes) (monthly)

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**Average Change in Self-Efficacy Ratings Over a 6 Month Period**

![Graph showing average change in self-efficacy ratings over a 6 month period for different procedures.](image)
Research Questions: What are current practices for providing procedural training and competency assessment for U.S. and Canadian PEM attendings?

Methods: Web-based survey to members of the PEM Fellowship Directors and Associate Fellowship Directors listserv, representing 91 PEM programs.

Results: 82 of 146 recipients (56.2%) responded. Three did not provide data on specific procedures. 63.4% of respondents work in EDs in free-standing Children’s Hospitals. 64.6% are part of a Department of Pediatrics. 58.5% of responders report that their divisions offer procedural training to attendings while 14.6% report assessment of procedural skills. No one reported assessment without training. The most common procedure for which training and assessment are offered are orotracheal intubation (53.4% and 7.5%, respectively) with high fidelity simulation being the most common method for both (37/43 and 5/6, respectively). Frequencies of training for other procedures include: Intraosseous line placement (43%), central line placement (36.7%), chest tube placement (35.4%), defibrillation/cardioversion (33.8%), cricothyroidotomy (27.8%), pericardiocentesis (16.5%), paracentesis (2.5%), pleurocentesis (2.5%). High fidelity simulation and task trainers are the two most common methods reported for training of all procedures except intubation (high fidelity and certification course), defibrillation/cardioversion (high fidelity and certification course), pericardiocentesis (lecture and high fidelity), pleurocentesis (task trainer and lecture). High fidelity simulation and task trainers are the most common methods of assessment for all procedures. 50.6% identify cost as a barrier to training with lack of faculty interest and lack of standardized guidelines the next most common barriers (36.4% each). Lack of standardized guidelines is the most common barrier for assessment (51.9%) followed by cost (43%) and lack of faculty interest (38%).

Discussion: Practices in procedural training and competency assessment vary widely throughout PEM programs in Canada and the U.S. Simulation, including high fidelity and task trainers, is the most common methods for training and assessment for most procedures. Identifying cost-effective models and establishing guidelines for training and assessment programs may help decrease barriers to implementation.

References:

Disclosure of Interest: None Declared

PO 10-4 - Nasal-Tragal Length Measurement For Correct Endotracheal Tube Placement In Neonatal Simulators

Simulation for procedural and psychomotor skills

Submission ID: IPSSW2017-1173

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Background: Nasal-tragus length (NTL) estimates of endotracheal tube (ETT) depth are replacing weight-based estimates for ETT depth in neonates requiring endotracheal intubation. Existing neonatal simulators were designed before interest in using the NTL and may lack fidelity in this measurement.

Research Question: To evaluate the accuracy of 2 adjusted NTL formulas and the neonatal resuscitation program (NRP) weight based ETT depth chart in predicting proper endotracheal tube insertion depth in a cohort of neonatal simulators.
Methodology: This study followed a cross-sectional, observational cohort study design. Ten neonatal task trainers and manikins were tested. Simulators were intubated by direct laryngoscopy with an uncuffed ETT such that the distal tip reference double lines were aligned with the true vocal cords, indicating appropriate placement. Endotracheal tube depth was measured at the gum line. Tracheal lengths were measured from the vocal cords to the bifurcation of the trachea for each simulator that had a bifurcation. For each simulator the correct depth measured via direct laryngoscopy and the recommended depth from the weight based chart were compared with the predicted depth based on the adjusted NTL: NTL +1cm and NTL +0.5cm.

Results: The adjusted NTL + 0.5cm formula incorrectly predicts the depth needed for proper placement of ETT in 100% of tested simulators, the NTL + 1cm formula incorrectly estimates the depth needed in 63% of simulators, and the weight based chart incorrectly estimates depth in 75% of tested simulators.

Discussion/Conclusions: The majority of neonatal resuscitation simulations lacked physical and functional fidelity in regards to ETT insertion depth. The formula NTL + 1cm outperforms the NTL+0.5cm formula and the NRP weight-based chart, but still resulted in endotracheal tube misplacement in the majority of neonatal simulators. The SimNewB™, Newborn Anne™, Premie Blue™ and Premie Anne™ manikins had the highest levels of physical and functional fidelity of the neonatal simulators evaluated.

Disclosure of Interest: None Declared

PO 10-5 - Simulation-Based Evaluation Of Professionalism Milestones In Pediatric Sub-Specialty Residents
Submission ID: IPSSW2017-LS-13
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2Department of Neonatology
3Department of Anesthesiology

Background: The Accreditation Council for Graduate Medical Education (ACGME) initiated Resident Subspecialty Milestones in 2015 to assess personal development of subspecialty residents (fellows). Many of the advanced level training milestones are targeted at professionalism and team communication, which can be challenging to assess on a daily basis due to limitations such as clinical demands and time. As a result, feedback is often sporadic or overlooked. (1) The use of simulation for objective structured clinical exams (OSCEs) is a well-developed tool in undergraduate medical education. However, there is limited data on the use of OSCEs at the fellow level to assess professionalism. (2)

Objective: Assess the ability of an OSCE to evaluate ACGME milestones objectively for Pediatric Critical Care and Pediatric Anesthesia fellows.

Design/Methods: Each sub-specialty group developed 1 specialty-specific scenario per milestone. The following milestones were chosen for the Pediatric Critical Care fellows: Transfer of care with seamless transitions, Work in inter-professional teams, High standards of ethical behavior. The Pediatric Anesthesia fellows were evaluated on the following Milestones: Communication with patients and families, Giving and receiving feedback, and Interdisciplinary and Transition of Care. Using a checklist and global score mapped to each specific milestone, each fellow was assessed during the simulations by two faculty per station. Postsurveys were completed by faculty and fellows.

Results: Combined survey data were analyzed from all scenarios. Surveys were reported based on a 5-point Likert scale. Data reported as means and range. (M; Min:Max). Sample faculty (n=21) responses: It is important to have a milestone simulation program (4.7; 3:5); It is useful to observe these scenarios specifically (4.66; 3:5); The case was appropriate for the objective (4.65; 4:5); Ease of using the grading rubric (4.39; 3:5). Sample fellow (n=10) responses include: These scenarios helped to understand potential communication issues (4.53; 4:5); These were believable scenarios (4.72; 4:5); I understood the purpose of this activity before participating (4.33; 3:5). Data regarding inter-rater reliability and comparison of faculty evaluation to self-evaluation is ongoing.
Conclusions: Based on surveys, the simulation exercises were well received by both faculty and fellows. Faculty agreed that it was useful to observe fellows objectively with the intention of milestone evaluations. All fellows within the same program and discipline were evaluated in a consistent manner, allowing for an equal comparison of skill and knowledge across identical scenarios and situational variables. Ongoing validation of the evaluation tools are necessary to ensure reproducibility of observations.

References:

PO 10-6 – SimZones: An Organizational Innovation For Simulation Programs And Centers
Simulation Instruction design and curriculum development
Submission ID: IPSSW2017-1239
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Context: There is tremendous growth in the use of medical simulation, as busy hospitals leverage simulation-based approaches to train and develop clinicians and clinical teams with increasing frequency and diversity. Increases in complexity and volume of simulation-based learning programs presents several major challenges to those who lead and manage simulation programs and centers. The authors present five major issues in simulation management and delivery—1) supporting both single- and double-loop learning experiences, 2) managing the training of simulation teaching faculty, 3) optimizing participants, including individuals, groups, teams and other “players” to ensure learning, 4) balancing In Situ, node-based, and center-based simulation delivery, and 5) organizing simulation research and other value considerations—and explain how “SimZones,” a innovative system of organization for simulation-based learning, alleviates organizational pain associated with the five issues.

Description: “Zone 0” describes auto-feedback simulations typically practiced by solitary learners, often using virtual simulation technology. “Zone 1” describes simulation for hands-on instruction of foundational skills. “Zone 2” describes simulation for acute situational instruction, such as clinical “mock codes.” “Zone 3” simulations involve authentic, native teams of participants and facilitate team and system development. The authors also discuss translation of debriefing and development methods from “Zone 3” simulation into real patient care settings (“Zone 4”), and illustrate how SimZones enable longitudinal learning systems in both teaching and non-teaching hospitals.

Observation/Evaluation: Three International implementations in the US, New Zealand and Spain are presented.

Discussion: The presenters will discuss how Zones address the five issues, by supporting and differentiating multiple types of learning, by creating clarity around assembling participants and use of role-playing and actors, by guiding organization of simulation faculty training, by clarifying conditions where “high fidelity” is most valuable, and by guiding organization of sim-based research.

Image:
References:


Disclosure of Interest: None Declared

PO 11-1 - Can Simulation Improve Competency Of The New Bedside Nurse?
Programme development/ Administration and Program Management
Submission ID: IPSSW2017-1221

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Introduction: The National Council of the State Boards of Nursing (NCSBN) in the United States defines competency as “the application of knowledge and the interpersonal, decision-making and psychomotor skills expected for the practice role, within the context of public health” 5. Yet competency is difficult to measure and nursing is required by overarching bodies to assess, maintain, demonstrate, track and improve the competence of staff. It’s an unending process that is time and resource intense. According to the literature, competence in simulation can be assessed by defining the purpose, objectives for the knowledge and skills including the appropriate scenario, valid scoring tool and metrics, assessment of reliability of test scores and provide evidence to support inferences 1.

Description: The cardiac ICU orientation process consists of two phases. Phase I orientation is 16 weeks with a preceptor to prepare the nurse for independent patient care excluding fresh post-operative cases. At 1 year, the nurse is advanced to phase II training for fresh post-operative care. After completion, the nurse is sanctioned competent to independently care for these patients. However there was a flaw in the process. The data showed that staff felt the resource nurses were using subjective data, the process wasn’t streamlined, and nurses weren’t competent so it took longer to have them sanctioned, moreover there was no objective feedback prior to starting Phase II.

Method: An active learning session was designed using simulation as the tool to assess readiness to begin Phase II orientation. The Nursing Global Continued Competence Evaluation Model is a good representation of the framework used to develop the assessment sessions including the goal, objectives, scenarios, key critical actions, and outcome measures. An objective checklist tool was developed and utilized for each simulation session. Multiple pilot testing’s were completed with seasoned nurses to ensure validity of the key critical actions and scenarios, along with the training of the assessor. The assessment criteria required the nurses to identify 100% of the key critical actions in 2 of 3 scenarios. Post assessment the nurse was provided constructive feedback on performance. If not succeeded, a performance improvement plan was developed to assist with achieving the needed skills.

Results: To date, 32 nurses have completed the simulation assessment. 26 have met criteria and moved and finished Phase II orientation; 6 have required an individual improvement plan; of the 6, 2 were unsuccessful in completing the improvement plan. Post simulation survey the nurses felt more confident in their skills and stated they retained knowledge from each scenario.

Conclusion: Simulation is a valid and reliable method to assess competence and/or readiness of the cardiac ICU nurse. Further investigation is needed to understand simulation and competence in post-graduate nurses.

References:

Disclosure of Interest: None Declared

PO 11-2 - A High-fidelity Simulation Boot Camp for Pediatric Cardiac Critical Care Nurse Practitioners
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1227

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Context: Failure to recognize and manage complications in a postoperative child with congenital heart disease (CHD) can be fatal. The goal in managing these complex patients is to quickly identify and treat an acute event and prevent morbidity and mortality. Growing numbers of pediatric nurse practitioners (PNPs) are being utilized as front line providers in pediatric intensive care units (PICUs), with an increased responsibility for management of these complex patients; however, experience of PNPs in this setting is variable and little research has been conducted on the post-graduate educational programs used to train such providers. To date, there has never been a specific critical care PNP simulation boot camp.

Description: This was the first multi-centered, simulation-based PNP education project. This descriptive educational interventional study was conducted at The Johns Hopkins Simulation Center. The curriculum was mixed instruction of didactic, case studies, and hands-on high-fidelity simulation, which were based on high complexity cases and the eight CHD benchmark procedures. An expert opinion survey was conducted to guide the development of the curriculum. The aims of this project include: (1) increase the PNPs knowledge of the etiology of low cardiac output; (2) reduce the time to identify and implement appropriate treatment for an acute deterioration through the use of high-fidelity simulation scenarios; (3) improve the PNPs confidence in managing a deterioration.

Evaluation: There were 30 participants from 13 cardiac centers from the US and Canada. Knowledge was assessed with a pre/post-test format (max score 100). A paired-sample t-test was conducted and a statistically significant increase in the post-test scores was detected. [PRE: M= 36.8, SD 14.27; POST: M=56, SD 15.77; p = .000]. Confidence and satisfaction were evaluated utilizing an instrument developed by the NLN.3 Participants responded to questions using a five-point Likert scale, with higher scores indicating higher levels of quality. The participants reported a high level of satisfaction (M= 4.68, SD 0.30) and confidence (M=4.75, SD 0.31) with the simulation experience.

Discussion: Simulation boot camps have been conducted for physician training and have been shown to be an effective strategy for educating critical care providers. To our knowledge, this was the first time that this approach
has been used to educate nurse practitioners. In order to cover multiple, high complexity cases, we employed Rapid Cycle Deliberate Practice (RCDP) for selected high fidelity simulation scenarios. There was an overall improvement in knowledge, but baseline knowledge was low, which indicates that there is a need for education. The PNPs reported satisfaction and confidence in the simulation experience. Therefore, the lessons learned and instructional approaches from this experience may provide a framework on which similar PNP educational initiatives may be based.

References:

Disclosure of Interest: None Declared

PO 11-3 - Summer Camp Mock Codes: Studying Effects On Nursing Self-Efficacy With Medical Emergencies
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1089

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Background: With thousands of children attending summer camps, and rates of illness and injury similar to other child-centered institutions¹, there is a real possibility for medical emergencies. The duty to prepare involves medical protocol creation but also practice of such emergencies². Mock codes are simulated emergency medical scenarios that allow a team to rehearse in a safe environment, with opportunity to debrief and learn from gaps in their response. Although many camps have written health protocols³, the practice of these is largely unstudied and known to vary. A camp mock code curriculum may help address current gaps in camp emergency preparedness, as simulation is known to improve nursing self-efficacy⁴,⁵, knowledge and skills⁶. It is upon this foundation that the Summer Camp Emergency Program was created, and implemented at several Ontario camps this past summer. This innovative study opens the door to pediatric simulation in summer camps and other child-centered institutions.

Research Question: Does the implementation of a summer camp mock code curriculum alter nursing staff’s self-efficacy with medical emergencies?

Methodology: A prospective study was designed using pre and post-intervention surveys to study nursing staff self-efficacy. Nursing surveys were modified from the Nursing Competence Self-Efficacy Scale⁷ and included a 1 to 9 scale per question. Surveys assessed the nurses’ confidence to respond to emergencies and cope with stresses of an emergency. Twelve nurses, representing RPN’s to RN’s practicing for greater than 10 years, across four overnight campsites completed our study. Each camp completed four mock codes over the summer: anaphylaxis, seizure, asthma, and head injury. Pediatricians or pediatric residents facilitated each code and debriefing via mock code specific checklists and a study debriefing script.

Results: Data extracted from pre- and post-intervention surveys were analyzed via a two-sided paired t-test using a confidence interval of 95%. Statistically significant improvement was found in all three outcome measures: confidence to respond to emergencies improved from mean responses of 5.75 to 7.75 (p value 5.6 x 10⁻⁶), cope with stresses of an emergency
emergency from 6.08 to 7.75 (p value 2.7 x 10⁻³), and complete resuscitative tasks from 6.31 to 7.96 (p value 1.2 x 10⁻⁴).

**Conclusion:** The summer camp mock code curriculum improved nursing self-efficacy related to pediatric medical emergencies. This first of its kind program is a novel educational tool to promote confidence in providing pediatric emergency care among camp nurses and sets the foundation for further research in simulation in summer camps. Future studies should further document gaps in summer camp emergency preparedness, assess camp healthcare team performance via mock codes, and assess the feasibility of expansion of low fidelity simulation across camps on a larger scale.

**References:**

**Disclosure of Interest:** None Declared

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**PO 11-4 - The Role Of Simulation In Advancing Undergraduate Nursing And Medical Education Interprofessional Education (IPE)**
Submission ID: IPSSW2017-1130

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**Context:** Since inception in 2006 SimBaby® has become embedded within Children's Nursing and Medical Curricula at an internationally recognised university. The module involves inter-professional, high-fidelity simulation teaching and has been developed to provide an integrated approach to student learning highlighting the importance of teamwork, mutual respect and understanding of the roles of other professionals. It aims to assist students in developing the fundamental knowledge and skills required to assess and manage children presenting with common medical emergencies while enhancing student’s use of clinical tools such as the SBAR framework.

**Description:** Fourth year Medical students, undertaking their Child Healthcare module, alongside third year children’s nursing students, each participate in a simulated scenario based on a common paediatric emergency. [Figure 1] Common scenarios include: exacerbation of asthma, meningococcal sepsis, croup, dehydration and hypoglycaemia in the context of gastroenteritis and anaphylaxis. The student group are observed by both facilitators and their peers, who provide constructive feedback on aspects of performance including patient safety, situational awareness, communication, clinical skills and decision making.
Observation/Evaluation: Feedback suggests that students evaluate this learning activity very positively and have stated that they value the opportunity to exercise clinical judgement and decision making skills without endangering the child.1,2 Free text comments have included:

‘I think we should have much more exposure to SimBaby training’
‘SimBaby is a very useful, practical and memorable learning tool’1

To-date this project has achieved two prestigious prizes, a University Teaching Award in 2008 and a Research award in 2009.

Discussion: Simulation (SimBaby®) is an important initiative within a portfolio of IPE projects, providing a highly valued learning opportunity for both medical and nursing students.

References:

Disclosure of Interest: None Declared

PO 11-5 - Interprofessional Pediatric Hybrid Simulation – Nursing And Medical Students Learning Together Interprofessional Education (IPE)
Submission ID: IPSSW2017-1047

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Context: With competing demands for pediatric clinical sites and concerns for patient safety, students in pediatric medicine lack opportunities to function in an interprofessional team to provide care to patients and their families.1, 2 Thus, undergraduate pediatric medical education needs alternative methods to fill this gap. We piloted an interprofessional pediatric hybrid simulation program (mannequin combined with trained actor in the role of parent) for medical and nursing students. This novel approach of embedding actors within mannequin simulation, in the role of the parent, enriches the experience by enhancing realism, increasing the cognitive load, and providing immediate feedback from the “parent”.3,4

Description: Two pediatric mannequin scenarios were created, and trained actors were coached in the parent role. Scenarios were piloted with representative learners to ensure alignment with learning objectives, identify areas of ambiguity and confirm appropriate levels of fidelity. Five-member teams (3 medical and 2 nursing students) participated in the two hybrid simulations that highlight the differential diagnoses for children of
different ages presenting with the same chief complaint. Interprofessional facilitated debriefing followed each simulation.

**Observation/Evaluation:** To date, 40 students (24 MD and 16 RN) have participated in the pilot program, and student response has been overwhelmingly positive. Students demonstrated improvement in interprofessional teamwork – in the initial simulation students worked in parallel (MD with MD, RN with RN); however, following debriefing the students demonstrated collaborative teamwork. Students also demonstrated improvement in communication with the parent.

For the next steps, we plan to measure *interprofessional teamwork* and *team communication with the parent* using the Jefferson Teamwork Observation Guide (JTOG) and Communication Assessment Tool-Team (CAT-T), respectively. Through written reflections, we will also explore students’ perceived self-efficacy with interprofessional teamwork and communication with the parent, pre- and post-simulation. IRB approval has been granted.

**Discussion:** This novel pediatric hybrid simulation program provides medical and nursing students a unique opportunity to work collaboratively in an interprofessional team to provide care to a pediatric patient and parent in a safe environment. The program was developed collaboratively between nursing and physician faculty to ensure alignment will all learners’ needs, and facilitated debriefing was conducted by both groups of faculty to ensure an interprofessional approach. Collaboration between medicine and nursing faculty has contributed to the success of this innovative program. This novel program that incorporates trained actors in mannequin simulation addresses an important gap in pediatric medical education, and is an innovation that is easily transferrable to other groups of learners.

**References:**

**Disclosure of Interest:** None Declared

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**PO 11-6 - In-Situ Simulation For Latent Threat Identification In The Emergency Department**

*Crisis Resource Management/Human factors and Teamwork*

Submission ID: IPSSW2017-1119

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**Introduction:** The emergency department (ED) has been a popular site for in-situ simulation because it is a high-stress, high-acuity environment with a high turnover of patients (1-4). Working under situations of extreme stress can cause medical professionals to deviate from clinical guidelines and policies even if they know of their existence (2). In-situ simulation is a multidisciplinary team activity that offers a unique learning opportunity.

**Research Questions:** The main objective of the study is to evaluate the effects of in-situ simulation in identifying knowledge or application gaps related to established protocols in the ED at the American University of Beirut Medical Center (AUBMC). The second objective is to evaluate the effects of in-situ simulation on adherence to protocols and improved teamwork by avoidance of latent threats. Specific validated crisis resource management (CRM) criteria (closed-loop communication, role clarity, personnel support and, global assessment) will be measured via the validated Anesthetists Non-Technical Skills scale (ANTS) (5).
Methods: In order to design a more efficient and institution-tailored in-situ simulation intervention, a needs assessment survey addressing knowledge, attitudes and behaviors towards education and teamwork in the ED was performed.

In-situ Simulation Intervention: The study is a single-center investigator initiated prospective pre-post intervention, set at the ED at AUBMC. We propose using in-situ simulation in the ED on a bi-monthly basis to identify latent threats related to failed adherence to guidelines, system errors and communication mishaps. We will chose well-known protocols to the ED personnel from all disciplines and run an announced simulation scenario in the ED over 10 minutes followed by 20 minutes for debriefing. Behavioral patterns will be recorded and participants will complete post-simulation surveys. Two weeks later, the same scenario will be repeated unannounced with the same participants. Behaviors will be compared on the same scale (ANTS) between the first announced scenario and the second unannounced one.

Results and Discussion:
- The needs-assessment survey showed that most participants were somewhat familiar with high-fidelity simulation (55%), and want it in the curriculum whether it's in a laboratory (57%) or in-situ (68%). There was a perceived knowledge gap across all participants in communication skills (p 0.000) and dealing with difficult families (p 0.003). 55% of participants were aware of the existence of ED protocols, but only 7% always complied (6).
- In-situ simulation interventions will be specifically designed based on the prior survey results. We expect a significant improvement in adherence to protocols during the second (unannounced) scenario. We also anticipate behavioral changes resulting in better teamwork and improved simulated patient outcome.

References:

Disclosure of Interest: None Declared
Need for Simulation Innovation: To promote best outcomes for patients and communities, EMS providers must acquire and maintain disaster triage skills. Live simulation for pediatric disaster triage education is costly and often impractical. EMS providers request education modalities that are available asynchronously and on demand. Such modalities are more easily available for large numbers of learners, and serve to standardize the quality of EMS disaster triage training. Video games are a promising modality for disaster triage learning. Previous disaster triage video games have been limited by lack of variety when the game is replayed, inability to modify the game to reflect new triage strategies, and a static number of patients present at the disaster site. A further necessary innovation is a unified injury model to streamline depictions of injuries and patients’ status changes during the course of game play.

Problem Resolution: Subject matter experts from an academic medical center partnered with a private video game production team and students from an undergraduate video game course. The team built a prototype version of the game 60 Seconds to Survival. An injury model was created including blunt, penetrating and blast trauma for toddler, school-aged and adult-sized patients. The injury model includes initial vital signs and trends in vital signs over game play time, blood loss animations, and audio files for player interaction with disaster victims. Also included are expected triage levels in the START/JumpSTART triage system, the triage algorithm used most frequently in the United States. The setting for the prototype is a school in which a mass shooting has occurred. Additional components of the prototype are changes in spawn points for patients with each play, variations in number of patients and the severity of their illness or injury with each play, and code that allows for future changes in disaster setting and injury profiles.

Disclosure of Interest: None Declared

PO 12-2 - NRP: Using Apps To Augment Education
Multimedia, e-learning and computer-based instruction
Submission ID: IPSSW2017-1145

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Hypothesis/Research Question/Objective: The American Academy of Pediatrics (AAP) Neonatal Resuscitation Program (NRP) course is designed to teach neonatal resuscitation guidelines to healthcare providers who care for newborns at birth. Healthcare providers who manage newborns at hospital birth are required to participate in this evidence-based educational program every 2 years. An online exam plus computer-based simulations reinforce cognitive material and fill the gaps of “knowing how” and “knowing” to “showing how” in the current NRP Provider course. In 2016, the NRP introduced an interactive app to aid instructors and providers a “bedside” tool for immediate access to the NRP Flow Diagram and videos that model proper ventilation sequencing. Potentially, an app of this type has the prospect of being an additional educational tool to reinforce knowledge and skills.

Methods: Initial development started with identifying the key educational concepts for the NRP. Once the key concepts were identified, wireframes were developed as a site map. Assets were gathered or created (pdfs, video, audio) to augment the identified key concepts. The app design went through extensive testing and clinical review. Once approved the app was published for Android and iOS devices.

Anticipated Opportunities: How will providers of NRP benefit from bedside mobile technology like the NRP app? Is there a potential way to measure a provider’s performance after completing the NRP and using the app prior to, or during, resuscitation? What other utilities does an app provide when looking at episodic learning?

Anticipated Conclusion: There is a role for app enabled technology to improve patient care if used effectively. As the newest edition of the NRP grows, we anticipate an increase in accessibility and usability among providers and instructors.

Disclosure of Interest: None Declared
to the current guidelines. We took the opportunity to examine closely our goals for each skill station and how it might be better taught. Skills were taught by NRP instructors to each class one at a time. Learners would wander around the center and look for “open” stations. Multi-disciplinary teams were not formed until later for simulations, and the teaching from instructors was quite variable in content and scope they taught at each station.

Description: We set out to standardize the teaching portion of the skills by creating videos that taught and demonstrated the skills. Skills videos cover 1) Preparation, initial steps and PPV, 2) Alternate Airway and chest compressions, and 3) Emergency UVC placement and IV epinephrine. This decreased our number of skills stations from 4 to 3 since the skills were re-organized to more realistically reflect the flow and order a neonatal resuscitation will take. We also will organize learners into multi-disciplinary groups before skills training to allow team training during skills teaching.

Evaluation: Scripts and story boards were created for each video. Volunteer NRP instructors and simulationists from our institution who demonstrate expert level of NRP knowledge were used to act roles of a neonatal response team. All three videos have been created, each about 6 minutes long. We have had them extensively reviewed by our NRP instructors and made many edits based on feedback. Our instructors are very positive about the videos and are excited to see them in use starting January of 2017.

Discussion: The videos have been created. We desire to use them at our institution and make them available to other NRP instructors to teach the skills needed for neonatal resuscitation. We believe standardized teaching will improve learner competency.

Disclosure of Interest: None Declared

PO 12-5 - Testing A System In Response To A Child Sustaining A Seizure In The Out Patient Clinic

Patient safety and quality improvement
Submission ID: IPSSW2017-1048

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Background: The purpose in conducting this session arose from a previous simulation of a child sustaining a seizure in the OPC (Out Patients Clinic). The time to arrival of a pharmacist with a ‘go bag’ containing the required benzodiazepines was seven minutes. A repeat similar scenario was conducted to test the timing of the process enabling a child to receive the medication in a timely manner. The location is an OPC within a new Women’s and Children’s Hospital without an inpatient facility at this stage of development.

Objective:
- Measure the time to initiate the medications not stocked in the clinic Omnicell system.
- Benchmark the time of arrival of the pharmacist with the ‘go bag’.
- ‘Test’ the ability to ‘override’ the access process in the Omnicell
- Identify latent safety errors to ultimately improve patient safety

Method: A medium technology scenario was conducted ‘in situ’ on the ground level of the OPC commencing at time of recognition of a child sustaining a seizure. The manikin Laerdal Sim Junior and Sim Pad was utilized to emulate the case.

A limited Vocera (communication platform) broadcast group was initiated (for attending code team members) to mitigate any risks in confusing a simulation with a real situation. The caveat with this is team members were ‘preempted’ and consequently not entirely reflective of a ‘real’ situation.

Discussant: The clinic is within close proximity of the pharmacy where the ‘go bag’ is kept. However on this day of the simulation there was only one pharmacist on duty who could have been elsewhere. When the pharmacist receives a code call they are required to retrieve muscle relaxants from the (ground level) pharmacy. The ‘go
“go bag’ is locked in the narcotic room (which remains locked when there is no pharmacist in the department). The narcotics room has a key which is stored in the pharmacy safe requiring a keypad entry. If entry fails a key may have to be retrieved from the OPC level 2 offices for the safe (as this is the manual override process). The key is kept in the director’s office.

Results: Response from time of Vocera broadcast for the pharmacist carrying the ‘go bag’ was one minute and twenty eight seconds. The time for the clinic nurse from bedside to Omnicell and back was forty five seconds.

The following latent safety errors were identified:
- The green ‘lock tag’ requires scissors to open the bag, if unable to snap by hand.
- The pharmacist reported he searched in the bag for the required medications for approximately one minute.
- Labelling information in the ‘go bag’ was of a poor quality.
- Omnicell override failed during the simulation.
- Potential risk of delay in medications arriving.

This in situ simulation has achieved the objectives and provided opportunities to reveal latent safety errors in striving towards a culture of patient safety.

Disclosure of Interest: None Declared

PO 12-6 - An Answer For Simulation On The Go: "Pets"
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1084

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Context: The Neonatal Resuscitation Program (NRP) Pediatric Education Training & Simulation (PETS) skill stations were developed in collaboration with the NRP Steering Committee to be conducted at the American Academy of Pediatrics’ National Conference & Exhibition. Development of PETS stations was necessitated by the release of the Textbook of Neonatal Resuscitation, 7th edition. The PETS stations focused on two simulation scenarios and provided educational guidance on teaching and debriefing skills and are intended for use in hospitals or organizations without access to a simulation center or with limited access to equipment. The stations created an all-inclusive simulation experience that can be replicated and used in settings outside of a hospital while providing a realistic environment for participants.

Description: The PETS stations were designed to teach medical practitioners how to deliver and resuscitate the newborn as the stations mirror the equipment, monitors, and supplies found within a functioning Labor & Delivery unit in the United States. All equipment and supplies listed in Appendix 1 and 2 of the NRP 7th edition textbook were incorporated into the stations. In addition, one neonate and one premature infant simulator, with anatomically correct airways, were included alongside prewritten scenarios. Most essential supplies were placed in a hang up jewelry organizer for ease of access. This allowed for numerous materials to be transported to their destination effortlessly.

Observation/Evaluation: We found that the most insightful feedback was from direct observation of participants during implementation of the skill stations. In planning the course, we took many administrative steps to facilitate a fast-paced realistic experience, and learned that some steps were easier to accomplish onsite with participants. We found that creating a realistic environment enhanced the teaching and debriefing components of the skill stations. By focusing on the skills and teamwork needed to successfully complete a scenario, the participants took away valuable skills that they could apply in their varied professional settings.

Discussion: Our challenge was to take a monumental list of equipment and functionally incorporate it into a location not normally utilized for medical simulation. While participants involved with the simulation were pleased with the overall realistic setting provided, it appeared that not everyone utilized all of the equipment. While performing clean-up, it was apparent certain supplies were untouched. Whether this is due
to time constraints for the actual simulation or just being overwhelmed by the sheer amount of equipment provided is unclear. Overall, the potential for NRP instructors traveling to surrounding communities with PETS stations greatly increases the quality of simulation available. They provide benefits to those with limited resources and those providing simulation support outside of their facilities.


Disclosure of Interest: None Declared

PO 12-7 – Virtual Antenatal Encounter and Standardized Simulation Assessment (VANESSA): A Pilot Study

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2. Ohio State University, Columbus, OH, United States.  
3. Mary Bridge Childrens Hospital, Tacoma, WA, United States.  

Background: Prenatal counseling at the limits of viability involves sensitive interactions between neonatal providers and families. Empathetic discussions are currently learned through practice in times of high stress. Decision aids may help improve provider communication but have not been universally adopted. Virtual standardized patients are increasingly recognized as a modality for education, but prenatal counseling simulations have not been described. To be valuable as a tool, a virtual patient would need to accurately portray emotions and elicit a realistic response from the provider.

Research Question: To determine if neonatal providers can accurately identify a standardized virtual prenatal patient’s emotional states, and examine the frequency of empathic responses to statements made by the patient.

Methodology: A panel of Neonatologists, Simulation specialists, and Ethicists developed a dialogue and identified empathic responses. VANESSA, a screen-based simulation of a woman at 23 weeks gestation, was capable of displaying anger, fear, sadness, and happiness through animations. 24 neonatal providers, including a subgroup with an ethics-interest, were asked to identify VANESSA’s emotions 28 times, respond to statements, and answer open ended questions. The emotions were displayed: without dialogue, with text dialogue, and with audio dialogue. Participants completed a post-encounter survey describing demographics and experience. Data was reported using descriptive statistics. Qualitative data from open ended questions e.g. “What would you do?” was examined using thematic analysis.

Results: Half of our participants had over 10 years of clinical experience (Table 1). Most participants reported using medical research (n=18, 78.3%) and mortality calculators (n=17, 73.9%). Only the ethics-interested subgroup (n=10, 41.6%), listed counseling literature (n=7, 70.0%). Of 672 attempts, participants accurately identified VANESSA’s emotions (n=523, 77.8%) of the time, and most (n=14, 61.11%) reported that they were confident in identifying these emotions (Fig 1). The ethics interest group were more likely to choose empathic responses (p= 0.002) (Fig 2). Participants rated VANESSA as easy to use (n=22, 91.20%), and reported that she had realistic dialogue (n=15, 65.22%).

Discussion/Conclusions: This pilot study shows that a prenatal counseling simulation is feasible and can yield useful data on prenatal counseling communication. Our participants showed a high rate of emotion recognition and empathy in their responses.
### Table 1. Demographics

<table>
<thead>
<tr>
<th></th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>16 (67)</td>
</tr>
<tr>
<td>Male</td>
<td>8 (33)</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
</tr>
<tr>
<td>Physician</td>
<td>17 (71)</td>
</tr>
<tr>
<td>NNP</td>
<td>7 (30)</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
</tr>
<tr>
<td>Caucasian/non-hispanic</td>
<td>17 (74)</td>
</tr>
<tr>
<td>Asian</td>
<td>5 (22)</td>
</tr>
<tr>
<td>Multi-racial</td>
<td>1 (4)</td>
</tr>
<tr>
<td><strong>Clinical Experience (years)</strong></td>
<td></td>
</tr>
<tr>
<td>&lt; 10</td>
<td>12 (50)</td>
</tr>
<tr>
<td>&gt; 10</td>
<td>12 (50)</td>
</tr>
<tr>
<td><strong>Prenatal counseling training</strong></td>
<td></td>
</tr>
<tr>
<td>Observation</td>
<td>23 (96)</td>
</tr>
<tr>
<td>Workshop</td>
<td>4 (17)</td>
</tr>
<tr>
<td>Simulation</td>
<td>9 (38)</td>
</tr>
</tbody>
</table>

### Figure 1. A comparison of neonatal providers confidence and accuracy in emotion recognition

![Chart showing comparison of confidence and accuracy in emotion recognition](chart1.png)

### Figure 2. Frequency of empathic and non-empathic responses to VANESSA.

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage of Responses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can see that this is upsetting</td>
<td></td>
</tr>
<tr>
<td>I can't imagine how difficult this must be</td>
<td></td>
</tr>
<tr>
<td>Take your time</td>
<td></td>
</tr>
<tr>
<td>I am sorry</td>
<td></td>
</tr>
<tr>
<td>I have some more information to...</td>
<td></td>
</tr>
<tr>
<td>Everything will be ok</td>
<td></td>
</tr>
<tr>
<td>Don't cry</td>
<td></td>
</tr>
</tbody>
</table>

![Chart showing frequency of responses](chart2.png)
Using Rapid Cycle Deliberate Practice to Improve Resident Performance During Mock Codes

Debriefing and teaching methodologies

Submission ID: IPSSW2017-1245

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Abstract Body: Resuscitation of a child with a cardiopulmonary arrest requires crucial teamwork skills with all members following the same PALS algorithm. Adherence to standardized resuscitation guidelines results in shorter times between arrest and administration of appropriate care (time to epinephrine of under 5 minutes per AHA guidelines) as well as improvement in outcomes/mortality.¹,² Unfortunately even with regular PALS training, care provided during pediatric in-hospital arrests continues to differ from the recommendations.³ This discrepancy in care is partially attributable to the lack of training in team work and communication combined with relatively few repetitions during which the trainees “get it right” during current, standardized PALS training. In an effort to provide more training, the Children’s of Alabama (COA) Pediatric Simulation Center (PSC) has conducted bimonthly in situ mock codes. These team simulations have improved hospital-wide systems, uncovered latent errors and improved algorithm adherence, but fail to achieve the consistency and excellence required to best care for these critically ill children.

These persistent gaps have led to additional training. In an effort to improve code performance, Rapid Cycle Deliberate Practice (RCDP) training was implemented for pediatrics and medicine pediatrics residents at Children’s of Alabama (COA) in Birmingham, Alabama in January 2016. RCDP offers the opportunity for real time feedback from an expert in code management. In particular, the opportunity for trainees to repeatedly practice these skills and build upon them may be significantly enhanced with RCDP. RCDP training in the recognition and management of pulseless cardiac rhythms was provided during announced simulation sessions in the PSC. Post-RCDP resident performance was evaluated during bi-monthly, unannounced in situ mock codes. Pre- and post-intervention comparison of data was performed.

Data was analyzed from 27 pre-RCDP and 19 post-RCDP mock codes. Time to epinephrine administration (goal ≤ 5 minutes), announcing leader and announcing correct rhythm were compared pre- and post- RCDP. Comparison of pre and post-RCDP time to epinephrine administration was decreased but not statistically significant (pre-RCDP: 5:29 ± 1:47 minutes; post-RCDP 5:02 ± 1:44 minutes). However, there was a statistically significant decrease in the number of times epinephrine was administered in ≤ 5 minutes (pre-RCDP: 10/27 (33%) vs. 12/19 (63%) p≤0.05). Leader announcement was improved but not statistically significant (pre 13/27 (48%) vs post 11/19 (58%). There was a statistically significant improvement in identification of the correct cardiac rhythm (pre 10/28 (36%) vs post 13/19 (68%) p ≤0.0005).

Individual RCDP training has been effective in improving code management during in situ mock codes at COA, however variability still exists. Team RCDP training is a potential avenue to explore to further close the gap.

References:

Disclosure of Interest: None Declared
PO 13-2 - Debriefing Clinical Events in The Nicu- Train The Debriefer Program

Debriefing and teaching methodologies
Submission ID: IPSSW2017-1202

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Background: Best practice for effective debriefings in healthcare has been developed for simulation-based education, but not yet for debriefing clinical events. Benefits of performing a debriefing after an actual clinical event include psychological release of strong emotional responses to the event, learning from things that went well or things that could be improved, and uncovering latent safety threats in the system. Development of a structured Train the Debriefer curriculum with the ability to more objectively evaluate debriefing effectiveness will increase the frequency, effectiveness and sustainability of a debriefing critical events program.

Objectives:
1. Develop an evidence-based curriculum: a practical guide for the: who, what, when, where, why, and how to debrief in the NICU.
2. Implement and train a multidisciplinary group of healthcare professionals to become competent in debriefing methodology.

Project Design and Methodology:
- PHASE I: Needs Assessment Survey: to identify the: who, what, why, where, when, and how aspects of the new program.
- PHASE II: Curriculum and modified DASH Assessment Development: utilizing simulation-based best practice methodologies, outcomes of the needs assessment survey, and collaboration with experts in the field of healthcare simulation at The Center for Medical Simulation (CMS) to develop the details of the curriculum. Working with the developers of the DASH (CMS) and a statistician, study investigators will modify and validate the DASH as a tool to evaluate the quality of clinical debriefs.
- PHASE III: Implementation of the Train the Debriefer curriculum

Outcome Measures:
- Pre and post-cognitive test to assess learner's cognitive knowledge gains from the program
- A modified version of DASH will be administered to evaluate the effectiveness of the debriefers and the debriefing sessions
- Rates of actual clinical event debriefings will be tracked to evaluate improvements and/or declines in frequency
- Psychological safety survey post actual clinical debriefing sessions will be administered and evaluated.
- Number of latent safety threats identified from clinical event debriefings will be tracked.

Significant Advantages: Inexperience with debriefing methodology can lead to ineffective debriefings, cause emotional harm and psychological stress. Most clinicians are not familiar with, nor trained in debriefing methodologies. A formal debriefing program, based on healthcare simulation debriefing, will help clinical teams introspect about their performance, learn from preventable errors, identify latent safety threats, and ultimately improve clinical outcomes.

Conundrum or Potential Problem Areas: We anticipate scheduling issues as we plan to train multidisciplinary team of healthcare workers. Leadership support is vital and use of online learning modules will help overcome this problem.

Questions for Discussion: Other tools to assess quality of the debriefing program and the debriefing sessions?

References:
19. Wickers MP. Establishing the Climate for a Successful Debriefing. Clinical Simulation In Nursing.6(3):e83-e86.
32. Institute of Medicine Committee on Quality of Health Care in A. In: Kohn LT, Corrigan JM, Donaldson MS, eds. To Err is Human: Building a Safer Health System. Washington (DC): National Academies Press (US) Copyright 2000 by the National Academy of Sciences. All rights reserved.; 2000.

Disclosure of Interest: None Declared

PO 13-3 - Effective communication training program in the Pediatric Intensive Care Unit: Primary results. Debriefing and teaching methodologies
Submission ID: IPSSW2017-1264

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Introduction: The communication is recognized as a professional competence that has an impact on the patient and the patient’s family’s care quality. It is also extremely important to develop educational strategies that are integrated into the curricula of health care professionals in training.
Objectives: To describe an effective communication skill acquisition program in the Pediatric Intensive Care Unit for physicians in training.

Material and methods: An annual course was designed for 40 PICU fellows, consisting of 10 mixed modules; with bibliographical material in the web campus and a face-to-face reflection workshop: with an introduction, a selected video trigger, leaders for the group discussion, a brief theoretical review and final conclusions. Monthly meetings were held from August to December 2016, in each of the 4 PICUs, with the participation of the health care staff from each Unit. An anonymous survey was conducted at the end of the fifth module, to evaluate the usefulness of the course.

Results: Five from the ten modules were carried out. Module I: Generalities of Effective Communication. Module II: Communication of Bad News. Module III: Communication of Brain Death Diagnosis / Organ donation request. Module IV: Burnout and Empathy Wear. Module V: Presence of parents during invasive procedures. Forty physicians in training attended at least at two of the five modules. Thirty participants (75%) answer the survey. They all agree that effective communication is an important competence in their professional practice and that can be learned and trained; the 80% considered the modality was useful; they agreed that the Module III was the most interesting; the 76% observed improvements in the communication ability with patients and the health care team, and finally the 83% would do it again.

Conclusions: It is possible to implement an effective communication training program in a Hospital with high and complex care demand, for physicians in training in the PICU. The participants reported high levels of satisfaction, and an important improvement in medical communication in their interventions with patients, patient’s family and the health care team.

Disclosure of Interest: None Declared

PO 13-4 - Rapid Cycle Deliberate Practice Vs. Traditional Simulation In A Resource-Limited Setting

Debriefing and teaching methodologies

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Background: High-fidelity simulation has shown improved resident knowledge and performance¹,²,³. While there is evidence that learning is not dependent on simulator fidelity⁴, there is little research on low-fidelity simulation to teach complex scenarios, particularly in pediatrics. Rapid Cycle Deliberate Practice (RCDP) is a simulation technique allowing for rapid feedback and mastery of skills with graded difficulty levels⁵. We sought to develop a simulation-based curriculum for pediatric residents in Rwanda utilizing either RCDP or traditional debriefing.

Research Questions: Will a simulation-based curriculum for pediatric residents in Rwanda utilizing instruction with RCDP lead to greater improvement on simulation-based performance when compared with traditional debriefing?

Methodology: Research was approved by the Centre Hospitalier Universitaire de Kigali (CHUK), Boston Children’s Hospital, and Texas Children’s Hospital IRBs. Pediatric residents rotating at CHUK were randomly assigned to one of two simulation curriculum groups (RCDP or traditional simulation) and completed a six month-long simulation-based curriculum addressing management of shock, respiratory failure, and cardiac arrest to improve pediatric resuscitation skills. Pre- and post-testing was videotaped and scored by two investigators using a modified Simulation Team Assessment Tool with scoring agreement between investigators assessed. Differences in demographic data were assessed using the Pearson Chi-square test and the Mann-Whitney test for non-normally distributed variables. Matched pre- and post-test scores were compared using the paired t-test, while score differences (post-pre) were compared between study groups using the independent t-test. ANCOVA
was utilized to adjust pre-test results between study groups and post-test scores. Reliability testing was conducted using the intra-class correlation coefficient (ICC).

Results: Randomization resulted in no statistically significant differences between groups in demographic factors. There were significant increases between pre and post-test scores by 21% overall and when stratified by group (p-value<0.001, respectively). However, there was no effect on score differences by study group (p-value = 0.94) or when adjusting for pre-test results (p-value = 0.81). Consistency for both raters’ scores were excellent for pre (ICC = 0.95; p-value<0.001) and post (ICC = 0.96; p-value<0.001) test score observations.

Discussion/Conclusions: Completion of a six-month simulation-based curriculum for pediatric residents in Rwanda led to statistically significant improvement in performance in a simulated resuscitation. Residents randomized to receive instruction utilizing RCDP vs traditional debriefing demonstrated similar improvement. Low-fidelity RCDP and traditional simulation-based instruction may both be valuable tools to improve resuscitation skills in pediatric residents.

References:

Disclosure of Interest: None Declared

PO 13-5 - Big Lessons For The Little People - Paediatric Simulation In Medical Student Teaching
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1124

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Context: Due to limited exposure, medical students often lack confidence in recognition and management of acutely unwell children. High Fidelity Simulation (HFS) provides the opportunity to practice patient care and develop teamwork and communication in a safe environment (1,2). Whilst HFS is used frequently in adult specialities and within post-graduate paediatric training, it is rarely used in paediatric undergraduate medical education (3) and hence its value in this context is unknown.

Description: We aimed to ascertain whether undergraduate paediatric HFS could 1) build student’s confidence and 2) improve recognition and management of the acutely unwell child. Groups of 6-8 students attended a day of paediatric HFS. Students were randomly allocated to teams of 2 or 3 and each student participated in at least two scenarios. Teams were shuffled throughout the day and for each scenario a team leader was randomly allocated. The scenarios were: Asthma, Sepsis, Anaphylaxis and Trauma. After each session all students were debriefed using the iTrust model (4). Feedback focussed on technical and non-technical skills such as Human Factors, teamwork and communication. The sepsis scenario was then repeated.
Feedback was collected on confidence in recognising and managing acutely unwell children before and after teaching. Students were asked if they had enjoyed the teaching and if they felt HFS should be a regular part of their paediatric placement.

Data was collected during both of the sepsis scenarios on time till various interventions were started. Sepsis was chosen because there are measurable interventions that have been shown to improve outcome (5).

**Observation and Evaluation:** The students unanimously found HFS useful and pitched at an appropriate level. They showed significant improvement in their confidence in managing acute presentations and 85% of students ‘strongly agreed’ that simulation is an effective way of learning how to manage a sick child. All students thought that HFS should become part of their paediatric syllabus.

There was significant improvement in the recognition and management of sepsis. Students were on average 62% (3:45 minutes) quicker to give oxygen after teaching, and the time to give antibiotics improved by an average of 36% (2:30 minutes). Parameters such as time to verbalise “sepsis” and time until intravenous access was gained also improved.

**Discussion:** HFS is a valuable way of improving recognition and management of the sick child. Our feedback shows that students would like more simulation teaching, and that they believe it is a valuable way to learn. There is potential for HFS to be integrated into the paediatric placement as it not only improves students’ confidence in the management of sick children but also addresses non-technical skills at an early stage in training.

The student’s management of sepsis was greatly improved by HFS. We intend to run another sepsis scenario in 3 months to see if improvements are maintained.

**References:**

4. iTRUST Debriefing Model – reproduced with permission from Bristol Medical Simulation Centre

**Disclosure of Interest:** None Declared

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**PO 13-6 - Simulation Enriched, Multi-Modality Training In Procedural Sedation For Gastroenterology**

*Simulation instruction design and curriculum development*

Submission ID: IPSSW2017-1110

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**Context:** Pediatric gastroenterology (GI) fellows in an academic, free-standing children’s hospital are expected to achieve competence in providing procedural sedation. The majority of GI cases at our institution are done under general anesthesia leaving few opportunities for GI fellows to acquire sedation experience and nurses to gain comfort assisting them. Studies have shown that simulation-based training sessions are an effective way to improve knowledge, clinical skills, and confidence (1,2). Through simulation, knowledge can be taught simultaneously with technical skills (3). One goal of our study was to create a feasible, well-received curriculum that provided knowledge improvement and hands on application of skills through simulation. A second goal was to see if there was an improvement in crisis resource management (CRM) skills after focused simulation debriefing.

**Description:** GI fellows and nurses received lectures that covered sedation topics from patient selection through discharge after recovery. Multiple choice exams were administered pre- and post- didactic session. Skills training consisted of airway management on task-trainers and simulation sessions of laryngospasm and oversedation using SimMan®. Between the two simulations, there was a debriefing focused on CRM. Learners completed
evaluations of the lectures, airway workshop, and simulation sessions. Simulation sessions were videotaped and scored according to the validated Clinical Teamwork Scale (CTS) (4,5). Two reviewers independently rated the simulation videos using the CTS. In the few videos with interrater score discrepancies, the videos were reviewed and scored by consensus according to objective evidence. CTS scores before and after the debriefing session were compared.

**Evaluation:** The average knowledge assessment score for the group increased from 65% to 72% after the didactic portion. Evaluations were favorable with all participants ranking “Agree” or “Strongly Agree” on a five point Likert scale when assessing their understanding and reception of the material. The CTS scores for the simulation session after debriefing improved in one group, remained the same for three groups, and lowered for three groups.

**Discussion:** Based on knowledge assessments and curriculum evaluations, our training program was feasible and well-received with objective knowledge improvement. While learners felt subjectively more comfortable administering sedation on evaluations, there was a lack of improvement in CTS scores between the two simulations sessions despite debriefing focused on CRM skills between the sessions. This may be due to the fact that the GI teams did not have much baseline experience with CRM and may have benefited from formalized CRM training prior to simulation sessions. In conclusion, our study supports the use of simulation based courses using a multi-faceted and specialty-specific educational approach.

**References:**

**Disclosure of Interest:** None Declared

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**PO 13-7 - “Preparing You”: A complete SIM Service Line for Patients, Families, and Caregivers**

*Innovation/ Future Direction and Outreach Simulation*

Submission ID: IPSSW2017-1184

Lauren Mednick,1, 2, Brianna O’Connell3, 4, Christopher Roussin3, 5, Gena Koufos3, Melissa Burke3, Catherine Allan3, 6, Peter Weinstock3, 5

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**Context:** Chronic health conditions affect 7-18% of US children, and are often accompanied by complex medical management1, which can result in families feeling overwhelmed and stressed.2 Traditional methods for educating and training families have largely been limited to discussion with clinicians and observation/practice with patients. While such teaching is necessary in preparing families to care for their child, this often proves insufficient to achieve full and successful knowledge/skill transfer.3 Through realistic opportunities to repetitively practice new skills in low-risk settings, simulation applied to patients and caregivers, offers unique methodologies and new paradigms (more aligned with the adult learner), which may improve knowledge acquisition and performance of technical skills,4 as well as reduce anxiety through increased perception of preparedness to function in emergency situations.5 Simulation for families may be particularly useful at the time of a new diagnosis, initiation of new therapies or technology, or prior to a procedure, as many families report feeling technically incompetent, anxious, and lacking in self-confidence when faced with
novel medical experiences. Importantly, despite these potential benefits, simulation with families remains an underutilized tool infrequently discussed in the literature.

**Description:** To address the growing needs and applications of simulation for patient and families, our Simulator Program adapted all SOP to develop tailored experiences across multiple clinical specialties, culminating in a specific service line. To date, the service line has successfully initiated 6 projects, all at varying stages of completion. Current projects include simulation experiences targeted to families caring for a child with a vent and trach, patients and families returning home with a ventricular assist device, and patients preparing for invasive procedures such as an EEG or MRI.

The current presentation aims to discuss the construction, stages, and components of a “Preparing You” service line, benefits for both families and clinicians, and challenges encountered.

**Observation/Evaluation:** The authors will present pilot data demonstrating the impact of using simulation with families. Ultimately, as found with other preparation techniques, it is likely that decreased anxiety, increased self-efficacy, and improved cooperation achieved through simulation, could lead to improved medical outcomes.

**Discussion:** The use of simulation with healthcare professionals is commonplace and benefits to clinicians and patients have consistently been demonstrated. A dedicated simulation service line specifically for patients and families, spins the tool 180 degrees, with the goal of improving the entire healthcare journey through an enhanced sense of preparation, support, and comfort. On-going work aims to further explore the benefits, as well as challenges, of this extension of traditional medical simulation.

**References:**


**Disclosure of Interest:** None Declared
PO 14-1 - Implementation of the FACT for In Situ Pediatric Trauma: Observing Hospital Care for Head Injury

*Educational Outreach (Including remote, rural and International simulation education)*

Submission ID: IPSSW2017-1236

Chris Kennedy* 1, Ralph MacKinnon2

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**Background/Question:** Injury is the leading cause of death in children from 1-18 years. Severely injured children demand prompt intervention for optimal outcome. Preparation requires necessary personnel, equipment and protocols for initial resuscitation and transfer to definitive care. Initial trauma resuscitation is a complex task that requires prompt decision-making and reassessment post-intervention. Improving pediatric trauma care requires understanding readiness. To address this we developed an 8 metric multi-source reporting tool- the Field Assessment Conditioning Tool (FACT). These metrics include: 1. Facility scores 2.KPIs 3. Primary survey scores 4. Team Self-reflection. 5. Medical knowledge test. 6. Mental model survey. 7. Team-hospital interactions as identified during the debrief phase, and 8. Risk matrix scores. The aim of this study is to report the results of the key performance indicators (KPI)s for time critical head injury (TCHI) from onsite scenarios conducted at 10 UK hospitals.

**Methods:** As part of the implementation of a multisource performance improvement tool (the FACT) teams working in 10 hospitals in the UK were video-recorded while resuscitating 2 standardized pediatric trauma scenarios designed to represent serious injuries. A panel of simulation and trauma experts developed each scenario. KPIs were considered critical actions in the resuscitation of the specific traumatic injury. These metrics are presented for time critical head injury in table 1. All scenarios were conducted in situ as “surprise” events. Each scenario was allowed to continue until 30 minutes had elapsed. Data collection included 8 metrics related to knowledge, performance, and staff reflections. The focus of this report is to examine the KPI results for TCHI, whether they were accomplished, the frequency of success of each indicator and when applicable descriptive statistics were calculated. Data on KPIs were collected by post hoc review of time-stamped video-recordings of each scenario.

**Preliminary results:** Frequency of TCHI KPIs: 5/10 hospitals intubated the patient, 4/10 used at least 1 form of neuro protection. 3/10 Mannitol, 1/10 raised the head of bed, 1/10 expressed the importance of MAP. No hospital indicated the need for relative hyperventilation. Average time to pupil check= 8:24 minutes.

**Preliminary Conclusions:** In situ scenarios demonstrate the urgent need for improvement in the initial stabilization of pediatric head injury. Recommendations: Further analysis of the other seven FACT metrics to understand the relative contributions of knowledge, performance, and staff perceptions on team performance. Assist in the development and implementation of a cognitive aid to promote rapid stabilization of the pediatric trauma patient.

**References:**

**Disclosure of Interest:** None Declared
PO 14-2 – Paramedics Acute Pediatric Patient Based Simulation Training in Guatemala

*Educational Outreach (Including remote, rural and International simulation education)*

Submission ID: IPSSW2017-1258

Luis A. Moya-Barquin* 1, Diana Coronel-Martinez2
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**Objective:** Improve the skills, knowledge and attitudes to approach of Pediatric Acute Care Patient scenarios to voluntary paramedics – Bomberos Voluntarios -in Multidisciplinary Team in a Public Hospital in labor day training. During January-November 2061.

**Methods:** A simulation based scenarios of Acute Pediatric Care Patient are developed in pediatric emergencies simulation center - SOYUTZ- (mixed Russian-mayan word – soyuz and utz means GOOD UNION) in Hospital General San Juan de Dios, Guatemala City. Where is developed the Pediatric Critical Care postgraduate course of Universidad de San Carlos de Guatemala.

During 2016 Pediatrics residents, Pediatric Critical Care, Nurses, Respiratory Care Therapist, Surgery residents, Anesthesiology residents and medical students are involved. Each week 2-3 developed a 1-2 hour lesson based in simulation. Almost 80 students participates during the education program. 22 Paramedics participate in first lesson in December 2016.

**Results:** 22 Voluntary Fireman and paramedics participates in first session of simulation based course. 15 / 22 had academic level between 7th and 9th grade. The voluntary firemen and paramedics job is during weekends and some weekday nights. The main job of them is farmers in rural place in Guatemala. They had the first lesson simulation based about shock early recognition and intraosseous needle. Every one can describe the technique, perform the technique and make common decision making about pulse recognition and fluids in shock over the shock index approach. Everyone says are interested in continue the formation and use as quality improvement method in a country where educational resources outside hospital are difficult by schedule and price.

**Conclusion:** The Pediatric Acute Care Simulation based program is useful to discuss common goals and objectives developing teamwork and decision making better for the healthcare professionals and patients in voluntary firemen. Simulation based course will be take in 2017 as first step to nationwide firemen course and pediatric certification.

**Disclosure of Interest:** None Declared

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PO 14-3 – Educational Simulation Based Videos as a Tool for Training in Rural Places in Guatemala

*Educational Outreach (Including remote, rural and International simulation education)*

Submission ID: IPSSW2017-1248

Luis A. Moya-Barquin* 1
1PICU / Pediatrics, Universidad de San Carlos de Guatemala, Guatemala City, Guatemala

**Objective:** Improve the skills, knowledge and attitudes to approach of Pediatric Acute Care Patient scenarios in Ruralplaces with educational simulation based videos available in DVD, You Tube Channel and webpage.

**Methods:** A simulation based scenarios of Acute Pediatric Care Patient are developed and recorded in video in pediatric emergencies simulation center - SOYUTZ- (mixed Russian-mayan word – soyuz and utz means GOOD UNION ) in Hospital General San Juan de Dios, Guatemala City. Where is developed the Pediatric Critical Care postgraduate course of Universidad de San Carlos de Guatemala.

**Results:** 14 educational simulation based videos developed to show the cardiopulmonary assessment, high flow oxygenation, intraosseous needle, EZIO placement, clinical monitoring in shock, shock index approach, septic
shock approach, trauma approach and severe electrical injuries are developed for primary care and first level health care in rural places in Guatemala.

Script production, scenario development, lights, camera objectives and actors checklist were the production time to develop educational videos. Postproduction were developed to reach educational objectives with subtitles. The result was 14 videos available in DVD for rural places with no internet access, YouTube Channel called UTIP GUATEMALA and included in www.utipguatemala.com

Conclusion: The educational simulation based videos are a tool to reach places in modalities as DVD for rural places, in You Tube channel and in a webpage to widespread in Guatemala the common scenarios as a guide to perform the approach described in Guidelines and Protocols to Surviving Sepsis Campaign.

Disclosure of Interest: NoneDeclared

PO 14-4 - Developing An Interprofessional Blended Learning Orientation For A Greenfield Outpatient Center
Interprofessional Education (IPE)
Submission ID: IPSSW2017-1196

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Context: Developing an Interprofessional education orientation in a Greenfield health facility is challenging. We describe an Interprofessional blended learning curricula used to successfully orientate 300 plus healthcare professionals to a new pediatric outpatient center in the Middle East.

Description: A learning passport was developed to reflect the needs of each clinical employee working in the clinic. An employee completing the orientation had their passport signed off by the education lead and this information was updated in the employee institutional record. The education model was underpinned by blended learning inclusive of in-situ simulation. The model was based on Miller’s pyramid of competence; know, know how, show how and do. (Miller, 1990) Miller’s “know” was delivered using eLearning and didactic small group presentations. Topics focused on essential content to support quality and safe patient care, employee well-being and effective team performance. The “know how” was reflected in skill training which included procedures specific to clinics, point of care testing, equipment training, and electronic health records. “Shows how” was embraced using in situ simulation to practice (3-5 days, 20 cycles) and then evaluation (1 day, 5 cycles) of each clinic’s five top cases. Included in the curriculum was a one day Team STEPPS course focused on effective Interprofessional teamwork. Each day of simulation ended with a feedback session where the management of top cases and teamwork was discussed. Topics of discussion informed institutional best practice and stakeholder learning. Rapid response was also practiced by each clinic until the clinic leadership team observed competency.

Observation/Evaluation: Feedback from staff was excellent. Staff was uniformly positive with the blended model of learning; many were surprised by how meaningful it was and how much it supported their ability to work effectively together. There are no reports of latent patient safety threats or adverse events after 9 months and 5000 patient visits. Family feedback was positive; 98% reported being very satisfied with their care. From this experience we support embracing an Interprofessional model of education even in very new facilities, and traditional cultural environments in the Middle East.


Disclosure of Interest: None Declared
PO 14-5 – Teamwork and Decision Making Analysis with Educational Simulation Based Videos in Guatemala
Crisis Resource Management/Human factors and Teamwork
Submission ID: IPSSW2017-1252

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Objective: Improve the skills, knowledge and attitudes to teamwork and decision making in Postgraduates student in University Hospital in Guatemala City.

Methods: Comparison two simulation based scenarios of Acute Pediatric Care Patient are developed and recorded in video in pediatric emergencies simulation center - SOYUTZ- (mixed Russian-mayan word – soyuz and utz means GOOD UNION ) in Hospital General San Juan de Dios, Guatemala City. Where is developed the Pediatric Critical Care postgraduate course of Universidad de San Carlos de Guatemala 40 Postgraduate doctors in surgery, pediatric critical care and pediatrics are involved.

Results: 15 educational simulation based videos developed to show the cardiopulmonary assessment, high flow oxygenation, intraosseous needle, EZIO placement, clinical monitoring in shock, shock index approach, septic shock approach, trauma approach and severe electrical injuries are developed for primary care and first level health care in rural places in Guatemala.
An exercise and analysis of performance based on simulation videos can demonstrate differences in teamwork and decision making process on different groups. The exercise open the discussion to pitfalls and opportunities to improve in this areas. One of the videos had recorded common pitfalls and show the performance in lack of structured approach as a checklist.

Conclusion: The educational simulation based videos are a tool to postgraduate students to difference and realize the performance of structured teamwork and decision making process.

Disclosure of Interest: None Declared

PO 14-6 - High-Fidelity Simulation vs. Educational Video: Impact on Self-Efficacy and NRP Skill Retention

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3 University of Massachusetts Medical School, Division of Neonatology, Department of Pediatrics
4 Elliot Hospital, Manchester NH, Department of Neonatology

Background: Approximately 1% of newborns in the United States will require extensive resuscitative measures at birth1,2. Some studies have shown that resident physicians are completing training with minimal hands-on experience in neonatal resuscitation3. Both hands-on high-fidelity newborn simulation training and viewing of videotaped NRP resuscitations have been described as efficacious modalities for the training of NRP skills.

Research Question: The aim of this study was to determine if high-fidelity hands-on neonatal resuscitation training is more efficacious than watching video mock Neonatal Resuscitation Program (NRP) resuscitation scenarios for the training of resident physicians.

Methodology: This study included 50 University of Massachusetts (UMass) resident physicians. All mock code scenarios, video and debriefing sessions were held in the UMass Simulation Center. The cohort was randomized into either high-fidelity simulation (HFS) or video groups (Figure 1). Both study groups underwent an initial exposure (participation in hands-on high-fidelity simulation vs. passive viewing of a NRP resuscitation video). After four months, all participants returned to the simulation center and completed a hands-on high-fidelity mock NRP simulation scenario. Self efficacy questionnaires were completed by participants in the simulation center
both immediately before and immediately following each exposure. The resuscitations were video-taped and participants were scored for performance of NRP skills by a member of the study staff.

**Results:** Of the initial 50 UMass residents, 35 (70%) completed the study. Individuals in both the HFS group and the video group uniformly increased their self-efficacy scores after each respective initial intervention, however when the groups were compared, there were no differences between the degrees of improvement in self-efficacy scores (Figure 2, 3). This trend was also observed at the 4 month follow-up. Overall, the HFS group scored higher on the modified NRP evaluation skill checklist. However, despite higher scores, the HFS group was slower to complete critical tasks within the simulation scenario when compared to the video group (Table 1).

**Discussion:** The results suggest that high-fidelity hands-on neonatal resuscitation training may be as efficacious as watching video mock NRP scenarios for the training of resident physicians. It appears this improvement is sustained over, at least, 4 months. Statistical significance was not achieved in this study, likely due to the low power of the study. Yet, the results suggest that in the absence of the specialized technology and expertise required to educate using high-fidelity simulation, educational video should be considered as a similarly efficacious modality to train clinicians in NRP resuscitation.

**References:**

**Images:**
PO 14-7 - Turning The Ship Of Worries: Simulating Future Pediatric Care In Preparation For A Hospital Move

Patient safety and quality improvement

Submission ID: IPSSW2017-1225

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**Context:** Starting from September 2016, pCAMST was commissioned by the chief medical officers to run simulations with all the care units at the children’s hospital and the department of thoracic in preparation for the move of all departments to a newly constructed hospital building. The new building and wards have a very different layout than our old building and all units will be challenges in redesigning their daily work practices. In the same time organization shifted from traditional clinics to theme based care.

The aim was twofold- to test the new environments and equipment so that changes could be made and errors corrected before the move but also to provide staff with the opportunity to acquaint themselves with the new facility and turn worries into curiosity. Previous studies have shown the potential of simulations to assess workload as well as illuminate latent safety threats in existing and new healthcare environments1, 2. This presentation shares insights into how resource simulations can be designed and used on a large scale to prepare staff and managers before a hospital move.

**Description:** We used a collaborative process for designing the simulations for each unit. A team from CAMST met with managers and staff from each unit and identified key processes and procedures for each unit. They also identified common risk situations that the staff were anxious about and wanted to test in the new environment.

Each day started with a pre-brief introducing the instructors, the unit and the pedagogic model used in simulation. We then ran 3-4 scenarios, some process simulations where the teams would test normal work-practices. Other scenarios were procedures such as surgical or radiological procedures. Each day we also ran 1-2 scenarios where a previously stable patient deteriorated and the situation escalated into an emergency. In these scenarios we also tested the new telephone, emergency signaling systems and emergency equipment. Problems and latent safety threats discovered were documented in a risk assessment matrix. The documentation was feedback to the clinical and supportive units as well as to the managers in charge.

**Observation/Evaluation:** We ran 85 simulations during 24 days. Overall 285 staff and managers from 27 units participated in the simulations. Over 1499 issues were discovered. We focused on supporting the teams to stay constructive and a number of times new workpractices where invented by the teams that fit the new rooms and equipment.

The participants felt that the simulation revealed a lot of solvable issues and felt more secure to move into the new building.

**Discussion:** Simulated scenarios generate a lot of knowledge about latent patient safety threats, unsolved issues with technology and is a powerful tool for reconciling work as imagined or planned with how work will actually be done. We will continue to run in situ simulations in the units now that we have moved for continued improvement of work practices.

**References:**


**Disclosure of Interest:** None Declared
Context: The challenges of maintaining proficiency with both medical equipment and procedural skills within a critical care transport multi-professional working environment are significant. There is a constant need to provide training to staff, especially with regards to low frequency high risk events. We describe a method of establishing the leaning needs of team members within a combined neonatal and paediatric transport team, to enable them to remain compliant with their mandatory educational requirements whilst mitigating for low frequency procedural events in a bid to improve patient safety.

Description: Using a process adapted from the Royal Air Force we used the Difficulty Importance Frequency (DIF) methodology to score our equipment and procedural events. Based around this, we formulated a programme of education using a combination of simulation, didactic talks with quiz session’s and the implementation of an educational YouTube channel linked with QR codes to help meet staff learning needs. Team member were then allocated paper based forms, held within a communal file, and asked to record experience with the equipment or procedure on a rolling 3 monthly basis. Monitoring was done by the educational team who compiled the data on an excel spreadsheet.

Observation: On verbal feedback, we have noted that staff now view training with equipment in a more group based reflective way. Less frequently used equipment is now re-familiarized on a more regular three monthly basis and team members appear to be more open to simulating the use of this equipment. Due to the time constrained nature of the working environment we have found that it is necessary to capitalize on all educational events. Maximizing all encounters by utilizing one exposure to allow for learning on several different pieces of equipment enables a more efficient use of time and resources.

Discussion: Compliance versus competency is difficult to assess. We propose a model of self-ownership with regards to maintaining compliance with low frequency equipment and procedural skills within a just culture. We recognized that utilizing skills during an actual event can be used to as evidence of compliance. We have also endeavored to accommodate the variance in learning styles especially in time and resource restricted situations by implementing a combination of learning platforms including simulation. As a result of this we have now implemented a teaching based safety huddle to review on a regular basis.


Disclosure of Interest: None Declared
Feedback was received from 8/10 trainees on the day and one month after commencing their registrar posts. Trainees valued scenarios they perceived to be relevant to their everyday practice, targeted their specific stage of training and that provided personalised feedback. Trainees felt the course improved their confidence in becoming a registrar and this was maintained one month after starting their new posts. They felt that simulation in groups of more than two reduced the amount each trainee participated in a simulation and therefore reduced the value of the feedback they received.

Discussion: High fidelity simulation centres offer a fixed cost per day therefore increasing delegate numbers improves cost-effectiveness. We were able to minimise costs through faculty members who offered their time for free to administer the course and facilitate simulations on the day. Our feedback suggested that delegates valued simulation that addressed their specific learning needs and they preferred scenarios in pairs because of the more focused exposure and feedback. We hypothesise that high fidelity simulation in pairs therefore provides the most cost-effective outcomes.

References:

Disclosure of Interest: None Declared

PO 15-3 - Using Simulation to Manage Aggression in the Healthcare Setting
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1253

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Context: Workplace violence is common in healthcare with approximately 24,000 workplace assaults between 2010 and 2013.1 Inpatient psychiatric units are more likely to experience workplace violence from patients towards team members. Workplace violence, however, is underrepresented in healthcare education and often consists of passive learning. Simulation improves providers’ knowledge, skills, and communication. It would naturally follow that simulation could teach safety while working with a potentially violent patient. We created a novel training program to help our staff practice pre-planning, coaching, and situational awareness.

Description: This training program was conducted at a tertiary care children's hospital with a 40-bed inpatient psychiatric unit. This unit is staffed 24/7 with 10 pediatric mental health specialists who work with the patients to manage behavior. Currently staff receive standard aggression management training via an 8 hour class that is 6 hours of power point with 2 hours of hands on training. We created 6 simulation scenarios involving patients with escalating aggression to train our staff in de-escalation and restraint, as necessary. Our participants were staff members who direct our hospital response for aggressive patients or family members. Training sessions were 3 hours in which the 5-10 participants take part in 3-5 simulation scenarios to practice de-escalating a
patient with the least restrictive means possible. Simulated patients are also staff who have been given scripts to follow regarding the type of behavior escalation to fit the scenario. Following each scenario there is a standard debrief focusing on staff approach, decision-making, and group discussion of behavior management options. Reflections on the training program itself occurred after the official debrief.

**Observation/Evaluation:** We have run this training program 3 times with a total of 15 staff members. Staff engagement has been excellent with staff reporting that they feel less anxious about these types of situations and more prepared after having participated in the training. Participants reported that they found the scenarios realistic and more useful than current existing aggression management training. Three additional training sessions are currently planned. Formal surveys are currently in process regarding the impact of the training on staff preparedness for managing behavioral escalation.

**Discussion:** Simulations designed to reproduce behavioral escalation and aggression are feasible and more realistic than existing training methods in training staff on the alternatives to seclusion and restraint. Staff from our inpatient psychiatric unit were engaged in this training program and felt it was useful in helping them think through options and decision-making during these potentially dangerous situations. Additional study is needed to understand the impact of this training on staff preparedness and management of behavioral escalation.

**References:**

**Disclosure of Interest:** None Declared

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**PO 15-4 - Medical Non-Clinical Simulation**

**Innovation/ Future Direction and Outreach Simulation**

Submission ID: IPSSW2017-1201

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**Context:** Employees working in non-clinical roles at medical centers such as Boston Children’s Hospital are prone to geographic and emotional detachment from their customers at the bedside. The impact of their work, however, cannot be understated as in the case of the Information Services Department (ISD). This gap in service delivery and service needs prompted the creation of BCH’s first pilot simulation where non-clinical employees were put through a simulation program usually reserved for direct-care providers. Simulation provides a visual, visceral experience whereby non-clinical staff can safely experience a medical emergency – customized to demonstrate the impact their work has on the clinical care continuum.

**Description:** Participants were chosen for this novel offering based on their work, which is the development and support of patient care applications. Team members have limited interaction with end-users, but the services they provide are crucial to care delivery. This simulation provided a high-fidelity experience that could not be achieved by strictly using didactic methods or traditional team building exercises.

Based on learning needs the following objectives were developed:

- Enhance basic emotional intelligence comprehension to develop an ongoing approach to work/communication/relationships in ISD
- Develop and understand the ideal interplay between ISD and clinical teams as well as between ISD products and clinical performance
- Build empathy for the clinical perspective within the CHAMPS ISD department

To effectively meet these learning objectives, the course was designed with a multimodal approach: An opening didactic presentation discussed emotional intelligence concepts and incorporated gameplay for deeper levels of understanding. A panel of expert clinicians allowed for an open discussion between ISD employees and clinical leaders to discuss how their worlds interacted and where improvements could be made.
A visit to the ICU lead by the nurse manager lasting 20 minutes, allowing the participants to get a feel for the acute clinical environment and the complexities involved in providing excellent care. A high fidelity simulation complete with a native confederate clinical team allowed ISD employees to be directly involved in a complex care scenario and witness how data interruption impacts clinicians and patient care.

**Evaluation:** During debriefing participants reported that they were emotionally affected by their tour of the Cardiac ICU and then drawn into the medical simulation. Their impressions were on the whole positive, which was bolstered by the positive feedback in the post-program surveys.

**Discussion:** The overwhelming feedback indicated that participants had a change in the way they viewed their work and expressed a better understanding of how clinicians relied on multiple services to deliver care. This program can be adapted to suit a variety of non-clinical departments, managerial orientation and leadership development.

**Disclosure of Interest:** None Declared

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**PO 15-5 - A Technology Aid For Performance Assessment In Paediatric Emergency Department In-Situ Simulation**

**Innovation/ Future Direction and Outreach Simulation**

Submission ID: IPSSW2017-1046

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**Context:** Our Emergency Department runs weekly paediatric in-situ simulations for medical and nursing staff, followed by a brief focussing on clinical and human factors. We identified performance assessment measures via a literature search and used these findings to design a tool to allow trainers to collect key data relating to the sequential assessment and management of simulated paediatric patients in real time, and display the data appropriately to facilitate team debriefing.

**Description:** Using the core technologies HTML5, CSS and Javascript, we created a web application accessible via departmental iPads. Modelled on a structured ABCDE assessment and treatment approach, the application allows trainers to record times for key events during simulation, using the following markers:

- Time at which a clinical problem occurred
- Time at which the clinical or logistical problem is identified
- Time at which it is treated

Facilitators customise labels to display problems and interventions specific to the scenario. The labels and associated times are displayed in graphical form during the debrief, and allows for a chronological view of management steps. They can also be used to frame discussions on the influence of human factors and communication.

**Observation:** The tool has been trialled during weekly in-situ paediatric simulation, for example including a Paediatric Sepsis scenario. The scenario revealed that the team performed a rapid ABCDE assessment (completed at 4 min 30) with timely identification of diagnosis of sepsis (5 min); however there were significant delays in administration of an IV fluid bolus (due to unfamiliarity with weight estimation techniques) and IV antibiotics (due to a specific person not being allocated to the task). This was shown graphically (figure 1) to participants during the debrief and led to identification of reasons for delays and discussion of strategies to tackle them. Trainers and simulation participants provided subjective feedback on their experience with the tool (table 1). Feedback of the current of the tool has been positive from participants, who can visualise the impact of human factors upon their patient management, and facilitators who find it useful in highlighting key learning points.

**Discussion:** We have developed a working tool to record and visualise performance in paediatric simulation. Further features may include analysis of overall team performance over time and there is no reason why it can not be used in other specialties and disciplines.
Table 1: Comments from user feedback

<table>
<thead>
<tr>
<th>Participant Comments</th>
</tr>
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<tbody>
<tr>
<td>“It’s really helpful to see not only when you are identifying a problem but also to see bottlenecks and difficulties in providing good care” (ED ST3 Doctor)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Facilitator Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Scribbling notes on paper during the simulation makes observing behaviours difficult. With this app I can stay focused and quickly record the key points” (Facilitator, Paediatric ED registrar)</td>
</tr>
</tbody>
</table>


Disclosure of Interest: None Declared

PO 15-6 - A Descriptive Evaluation Of Clinicians’ Gaze Behaviours During Paediatric Simulated Emergencies

Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1123

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Background: Individuals experience events differently. We hypothesized that senior clinicians working in various clinical areas and with different training backgrounds will not perceive an event equally. Specific gaze tracking has been shown to be feasible in simulated emergencies.1 Evidence from aviation shows that expertise affects gaze behaviour2. It has also been shown in one clinical study that it is possible to teach the gaze strategies of experts to surgical trainees3.
Research Question: We sought to observe and define the gaze behaviours and explore the experience of clinicians during a simulated paediatric emergency.

Methods: We invited trainees and consultants working in general paediatrics, paediatric intensive care and the paediatric emergency department to participate. We adopted a mixed quantitative and qualitative design. Participants took part in a six minute simulation based on a cardiac arrest following a tricyclic antidepressant overdose. Participants wore glasses designed to record their eye gaze by tracking eye movements. Participants were then interviewed in an attempt to explore their experience of the scenario. Scenarios were recorded and the percentage of time spent standing in pre-defined zones was collected on review of the recordings.

Results: We recruited a total of 27 participants. The study demonstrated notable differences in standing positions between those from different specialties. Paediatric consultants spent 63% of their time at the right hand side of the bed (zone 1). In contrast consultants in paediatric emergency medicine spent 72% of their time leading the resuscitation from the foot of the bed (zone 2). There was a tendency for intensivists to stand at the head of the bed (zone 4) whilst the trainees positions were less clearly defined. [Figure 1] The gaze recordings are still to be analysed. They will be used to analyse key gaze behaviours including frequency of fixations, duration of fixations, latency to respond to key stimuli, and inter-response time to gaze behaviour towards stimuli. The interviews will be analysed qualitatively to explore for themes in the participants’ experiences.

Discussion/Conclusion: It is possible that paediatric emergency consultants may gain the greatest exposure to resuscitation scenarios in their daily practice. This may explain their comfort in standing at the end of the bed and leading the scenario. Intensivists gravitated towards the head of the bed, possibly due to their confidence in managing the airway. The trainees were much less defined in their positions. They spent longer in zone 3 than any other group. This may be explained in part by the location of an algorithm on the wall in this zone. Subsequent data will be available for presentation at the conference. We hope that ultimately this information can be used to develop pedagogical strategies for targeted training.

References:
Disclosure of Interest: None Declared

PO 15-7 - Simulated Encounter in Primary Care Clinic
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1243

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Purpose: This project exposes pediatric/medicine-pediatric residents individually to a simulated actively suicidal patient in primary care clinic scheduled for a 16yo well child visit. It is crucial residents gain knowledge and experience in understanding nuances of caring for suicidal teenagers.

Methods: This research study is designed to evaluate a resident’s experience in handling a difficult patient diagnosis in the primary care setting. Each resident during their first year of training has an individualized simulated encounter with a standardized patient (SP). Sessions occur in the pediatric simulation center and
video recorded allowing both real-time observation and playback options. The resident in the course of their routine history taking will learn the patient is acutely suicidal. The resident will have to determine how to further investigate these symptoms and determine the appropriate management course. The scenario is scripted and was piloted to ensure standardization in educational intervention. Following the scenario each resident participates in a nonjudgmental debriefing with the attending physician. A post-simulation anonymous survey is completed at the end of training. The survey evaluated effectiveness of simulation on a 5-point Likert scale and open-ended questions on learning themes and improvement suggestions.

Results: Simulations sessions started in July 2016. To date 6 residents have completed the educational intervention. Surveys to date show 6/6 (100%) learners strongly agreed the simulation was a helpful learning experience and were satisfied with content and quality of simulation. 5/6 (83%) strongly agreed they would be able to apply the concepts, knowledge, and skills to other clinical experiences. 6/6 (100%) strongly agreed they wanted more simulation in primary care. Learning themes included: Value of learning from a SP and receiving direct feedback from them, practicing being in an uncomfortable situation, talking through the protocol of safely getting the child to the emergency department and learning more about mental health. Improvement suggestions including: Adding component of talking to child’s mother about the suicidal condition and more time to discuss ways to approach difficult conversations/patients.

Conclusion: A suicidal pediatric patient is a delicate encounter and especially fragile in the outpatient clinic setting as part of a routine well-child visit. Quickly developing a rapport is crucial and a skill that comes with practice. This simulation is designed to give residents this exposure and practice feeling more comfortable in future similar encounters. Feedback has been positive and learners feel more prepared after the simulation exercise. In addition it allows supervisors to observe a difficult patient care scenario assessing each intern’s ability to communicate and think on their feet; both important ACGME competencies.

Disclosure of Interest: None Declared

PO 16-1 - A Novel Approach To Increased Fidelity For Neonatal Circumcision
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1078

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Context: Neonatal circumcision is commonly performed in the United States (US), on roughly 50% of males. Pediatricians are one of several specialists performing circumcisions; the Accreditation Council for Graduate Medical Education, which accredits US residency programs, states that pediatric trainees “should receive real and/or simulated training when [neonatal circumcision is] important for a resident’s post-residency position”. Due to competition among specialties and local practices, pediatric residents may have little clinical exposure to circumcision, necessitating simulation. However, there is currently only one commercial infant circumcision model. The Lifeform Infant Circumcision Trainer (®Nasco) was trialed by several pediatricians using the Gomco Circumcision Clamp. It was useful to demonstrate most procedural steps but lacked haptic feel and ability to simulate adhesiolysis or foreskin stretching. We substituted the manufacturer’s foreskin to address these issues.

Description: For the foreskin, a size 350Q Qualtex blush colored balloon was found to best stick to the glue and fit the model. From the closed end, two inches of balloon is cut off to simulate the prepuce. A small hole is cut in the top of the balloon then fit over the prosthetic. A blunt plastic cannula attached to a syringe injects glue in the hole around and below the glans of the penis to simulate adhesions. Several types of glue were tested and Fast Patch Vinyl Adhesive best adhered to the penis model after removing its original foreskin. The modifications were at minimal cost. The vinyl glue was $4.99 and the balloons were $11.99 for 100. Assuming the glue makes 100 foreskins the cost of the modification is $0.17 each. This procedure is being integrated into the required Newborn rotation.

Observation/Evaluation: Evaluation to date has consisted of verbal faculty and resident feedback. The tissue was noted as a more realistic thickness and allowed for practice securing all preputial tissue over the Gomco bell, a challenging aspect of the procedure. Participants were unable to visualize the linear indentation made
by crushing the tissue with a hemostat prior to cutting a dorsal slit, a procedural feature we could not replicate. Participants found adhesiolysis more realistic with the new version, although the glue separates somewhat during bell insertion, which does not impede securing the Gomco.

Discussion: Circumcision is an important skill for a subset of pediatric trainees, and the current lack of realistic task trainers has led to innovations to improve fidelity.\(^1\)\(^2\)\(^3\)\(^4\) Previously published models utilize meat products, subject to spoilage and challenges of long-term storage. Our low-cost design avoids decomposition issues and provides for ease of set up, given it’s a small addition to an existing model. Issues with preputial glue adherence and linear indentation can be improved still. We feel this model substantially enhances the existing commercial option.

Image:

References:


Disclosure of Interest: None Declared

PO 16-2 - Realistic Simulation-Based Training In Satellite Operating Rooms And Post Anesthesia Care Units
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1195

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Context: Simulation training is a valuable educational tool to prepare nursing staff to assist in the management of crisis situations that occur in the operating room (OR) and post anesthesia care unit (PACU). Simulation training allows nursing staff to practice essential skills in a realistic but safe environment.\(^1\) Simulation allows health care providers to learn from each other and from the actions performed/not performed using a nonjudgmental approach. Operating room team training programs have been associated with decreased patient mortality.\(^2\) The complexity of patients and types of surgical procedures being done at Boston Children's Hospital (BCH) satellite locations continues to grow. Although communication and teamwork is essential during all emergency situations, these skills become especially important in satellite locations which often have limited resources.
Description: In the spring of 2014, a proposal to support simulation training of all OR and PACU staff in the satellites of Waltham and Lexington by BCH Simulation Program, the BCH Department of Nursing, and the BCH Department of Anesthesiology, Perioperative and Pain Medicine was accepted. Several nurses were trained as facilitators to join a previously trained group of anesthesia attendings and nurses who taught as facilitators in other simulation courses at BCH. A needs assessment was sent to OR and PACU staff, and 30 staff anesthesiologists who frequently work at satellite locations. The needs assessment established the desire for simulation training and served as a foundation for scenario development. The scenarios developed were created to review and reinforce basic competence in low-volume/high risk cases or high volume/low risk routine cases. A pilot program was launched in March 2015 as a part of the "SIMNetwork" training program. Simulated cases lasted for approximately 20 minutes and following the scenario, the team assembled for a debriefing. The debriefings had two objectives: guided reflection and discussion of CRM principles, and review of crisis medical management.

Observations/Evaluation: To date, 34 OR nurses, 31 PACU nurses, 7 surgical technologists, and 6 clinical nursing assistants have participated in the satellite in-situ realistic simulation based training program. Post course evaluations have been overwhelmingly positive with most staff and voicing a desire for additional simulation training.

Discussion: The in-situ realistic simulation training programs facilitated the development of vital communication and teamwork skills in nursing staff working in BCH satellite locations. This pilot program supported the identification of nursing educational needs, and gaps in resources, processes and policies. Opportunities to practice the management of crisis situations are imperative for nursing staff working in areas with limited resources. Future simulation sessions will focus on the development of more medically complex and challenging scenarios.

References:

Disclosure of Interest: None Declared

PO 16-3 - Simulation Curriculum To Evaluate Competency In A Two-Person Neonatal Transport Team
Innovation/ Future Direction and Outreach Simulation
Submission ID: IPSSW2017-1217

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Context: The Intensive Care Nursery at Dartmouth-Hitchcock Medical Center provides consultation and transfer for 19 critical access hospitals staffed by providers with varied resuscitations experience as well as 3 level II nurseries staffed by hospitalists or Neonatal Nurse Practitioners (NNPs) and Physician Assistants (PAs). We average 180 neonatal transports/year. The Neonatal Transport team previously consisted of an advanced provider, Registered Nurse (RN) and Respiratory Therapist (RT). Three years ago we transitioned to a skilled RN/RT transport team with a cost savings of $500,000/year with improved departure times and satisfaction from referral hospitals.

Description: When the primary RT/RN transport team was developed a new curriculum was developed to ensure that the team provided the same level of care as the three-person team. The curriculum includes orientation as well as quarterly simulation evaluations; previously there was no educational program. When an RN or RT joins the Neonatal Transport team, their training includes didactics, advanced skills sessions and team-based high
fidelity simulations. Advanced skills include intubation, UVC placement, needle decompression and chest tube placement. Simulations are followed with video debriefing.

**Observation:** Quarterly skills and team simulations consist of varied scenarios and environments including the simulation center, mobile simulation ambulance and aircraft. These focus on team function, protocols, equipment review, communication, critical decision-making and crisis resource management. Identification of potential issues prompts modifications to equipment or management that positively impact a neonate on transport.

**Discussion:** In a rural setting with critical access hospitals, the Neonatal Transport team provides vital consultation, support and transfer to newborn providers. Maintaining skill set competency and strong team dynamics is vital to achieve a highly reliable team as a resource for our referring hospitals and to provide the highest level of care to our patients. Campbell et al. state that “providing didactic and experiential learning alone is insufficient to fully prepare teams that have limited exposure to rare events. Simulation-based training supplements and reinforces knowledge, skills and the experiences of team members” [1]. There are limited studies that evaluate the use of simulation-based training for transport medicine but simulation research in healthcare demonstrates improvement with team performance, patient care process and clinical outcome [1]. The creation of a standard simulation education curriculum in the orientation of new Neonatal transport team members and in the maintenance of competency has been successful in both providing excellent patient care and being cost-effective. The next step for evaluating the efficacy of this curriculum is to develop more formal metrics for maintenance of competency.


**Disclosure of Interest:** None Declared
students to increase their responsibility, thus, reflecting the skills and emotional resilience needed to create the adaptive practitioners of the future.

References

PO 16-5 – Simulating the *Scary*: MegaSim in PICU/CICU Nursing Orientation
Submission ID: IPSSW2017-LS-15
Amber Merritt, MSN, RN, CCRN, RN-BC; Kara Johnson, RN, Heather Walsh, RN, Janice LePlatte, RN, Michelle Desoiza, Sim Tech; Ashleigh Harlow, BSN, RN

Background: Nurses new to critical care face many cognitive challenges as they transition from novice to advanced beginner nurses. Of the hurdles they face, translating learning experience into practice may be the most challenging. Simulation provides a safe environment for new critical care nurses to practice at the edge of their ability without risk to patients. Feedback from multiple nursing orientation groups revealed resuscitation scenarios as the "scariest" for new nurses in their practice and a cause of anticipatory stress

Objectives: Our objective was to create a challenging multi-situation simulation involving the resuscitation of a patient requiring resuscitation and transfer between critical care departments (Pediatric Intensive Care Unit/PICU and Cardiac Intensive Care Unit/CICU) to evaluate participants' (new critical care nurses) perception of their skills in performing critical resuscitation functions (CPR, intubation assist, defibrillation, medication administration).

Methods: The simulation design involved the care of a PICU patient requiring resuscitation and transfer to the CICU for further care. Participants participated in a pre-simulation self-assessment and facilitated pre-brief before the simulation began. Using the B-line streaming video system, participants were able to review the simulation in its entirety during a facilitated debrief and complete a post-simulation self-assessment.

Results: Overall, participants in 3 different sessions stated increased confidence on post-simulation self-assessments when performing critical resuscitative nursing functions. Participants were also offered the opportunity to provide feedback to facilitators about their experiences to enhance the experience of future participants.

Conclusion: Simulation has been shown to increase confidence levels of nursing staff when performing resuscitative skills. Continued support of the simulation environment will be needed to further evaluate if the simulation leads to an increase in skill level in resuscitation events.

References:

Images:
PO 16-6 - A Prospective Study Of Physician Biometric Measurements Using A Wearable Performance Tracking Device

Crisis Resource Management/Human factors and Teamwork
Submission ID: IPSSW2017-1147

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Context: Following the Institute of Medicine’s seminal report, *To Err is Human: Building a Safer Health System*, much research has focused on human factors and how health care systems can adapt to improve care. Things including workload, knowledge, ability or experience, inadequate supervision or instruction, a stressful environment, mental state, and components of change have all been shown to influence errors1-2. As stress increases, our ability to perform many crucial cognitive and physical tasks greatly depreciates3. By tracking biometric data, we attempt to elucidate the degree of stress one “feels” while performing a multitude of clinical duties4-5. Through utilizing concepts of stress inoculation and cognitive offloading, we then attempt to mitigate these stressors and achieve better performance6-7.

Description: In this study, participants wear the Hexoskin™ biometric smart shirt which measures heart rate (HR), respiratory rate (RR), minute ventilation, cadence, energy expenditure and sleep parameters via a 4ms resolution...
256 Hz ECG, 8ms resolution breathing sensor, and 64Hz accelerometer. Participants record biometrics during simulation events as code leader or participants, as well during live critical care activities including patient rounds, endotracheal intubation, a family meeting and as leader of a code blue activation. For comparison, additional measures of home activity including running, relaxing and sleeping were measured.

**Discussion:** Via real-time activities and simulation-based training, this study explores patterns of stress in an attempt to better elucidate its effect on critical care physicians (CCP) in various scenarios. A secondary aim studies cognitive offloading techniques to ascertain their effect on biometric parameters as well as their effect on participant’s performance. Through investigation of ways to offload our mental workload, we will attempt to lower stress and fatigue while improving performance and enhancing care of the sickest of patients.

**References:**

**Disclosure of Interest:** None Declared

**PO 16-7 - Simulation for Multidisciplinary Teams Managing Neonates with Complex Cardiac Disease**

**Ideas & Works in Progress**

Submission ID: IPSSW2017-LS-09

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**Background:** Infants with prenatally diagnosed congenital heart disease often necessitate multidisciplinary collaboration in the delivery room and early postnatal period. Precise and accurate assessment of the infant immediately following delivery and throughout the resuscitation is critical for optimizing outcomes. Some conditions may require aggressive intervention and procedures in the immediate period after birth. While fetal echocardiogram is a useful diagnostic tool, there are anatomic and functional variations that are not always able to be fully elucidated antenatally. Potential challenges that may be encountered in the delivery room can be explored through simulation, and then anticipated and prepared for in advance.

**Educational Goal:** A scheduled cesarean section was planned for a full-term infant with hypoplastic left heart syndrome with restrictive atrial septum. This patient was felt to be at high risk for needing emergent balloon atrial septostomy. Simulation was utilized to explore the logistics of the delivery, including the resuscitation
Approach to Addressing the Goal: The neonatal team at Yale collaborated with maternal fetal medicine, pediatric cardiology, nursing, respiratory therapy, security and other ancillary and support staff to simulate this planned delivery and to pilot a model for multidisciplinary, interprofessional collaboration. The SYN:APSE simulation center at Yale facilitated in situ simulation in the resuscitation room with Sim NewB (Laerdal Medical, Wappinger Falls, NY). During simulation the infant was delivered, medically stabilized, and transported through the hospital to the catheterization lab for further evaluation and potential life-saving interventions.

The simulation revealed multiple issues with respect to human factors and teamwork that were then able to be addressed prior to the infant’s due date. Execution of this scenario – with education, participation, debriefing and re-engineering – led to process improvement and organizational change. After the simulated delivery and transport, detailed diagrams were created to illustrate where it would be optimal for each team member to be during the actual delivery in the resuscitation room and elevator. In depth discussion with neonatology and pediatric cardiology led to an appropriate, planned deviation from NRP guidelines with the decision made to immediately secure the neonate’s airway with endotracheal tube placement and mechanical ventilation. Simulation facilitated discussion about the type and timing of IV access and whether this infant would be a candidate for ECMO should his overall clinical condition worsen.

Creating and leading this simulation sparked the idea to develop a trainee-specific multidisciplinary neonatology-cardiology fellow curriculum focused on medical education and effective communication. It also forged an interdepartmental commitment to creative, hands on preparation, a novel tool that can be applied to other high-risk deliveries in the future. The hope is that this unique approach will lead to improved morbidity and mortality in anticipated or unanticipated complex neonatal conditions.

PO 17-1 - High-Fidelity Simulation in New Pediatric Emergency Department: Employing an After-Action Report
Submission ID: IPSSW2017-LS-10

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Context: Prior to opening a new Pediatric Emergency Department (PED), the associates went through several hours of training which included the space, new equipment and increased technology. After training the unit was able to host a ‘day in the life’ event for associates. This event typically focuses on day to day work flows. The associates had many concerns related to high risk patient situations. Based on these concerns the unit leaders consulted the simulation team to assist with this training. Two cases were developed and the goals of the training shifted to identification of latent safety threats and increasing staff comfort with the new space.

Description: An interdisciplinary team designed 2 cases, a pediatric trauma case using a high-fidelity simulator and a behavioral health case utilizing a standardized patient. Three 2 hour sessions were held and 3 different interprofessional teams were able to participate. Each session included both cases with debriefings after each case. After the event the simulation team compiled an after action report (AAR) that summarized identified latent safety threats and recommendations based on observations and associate feedback during the debriefing sessions.

Observation/Evaluation: During the simulation sessions 7 latent safety threats were identified. In the AAR additional opportunities were also summarized including four recommendations for environment and equipment issues, three teamwork and communication opportunities and 3 process issues. Follow up in situ simulations were also planned following unit activation to test mitigation strategies and retest the systems.

Discussion: The AAR format was effective in summarizing multiple SIM events that had same objectives and translating it into meaningful action items for unit leadership to effect change prior to unit activation. The associates also reported increased levels of comfort prior to the activation of the new PED.
PO 17-2 - Errors Observed During The Use Of Defibrillator In Simulated Pediatric Patients
Submission ID: IPSSW2017-LS-11

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Introduction: Medical mistakes under stress situations, such as cardiopulmonary resuscitation (CPR) are frequent. Medical mistakes during pediatric emergencies and pre-hospital care have been barely studied. The main goal of this study was to determine the number of life-threatening mistakes incurred by physicians while using a manual external defibrillator (MED) as assessed during pediatric emergency simulations in our environment.

Material and Methods: Prospective observational study carried out at the SIMMER medical simulation center, in Buenos Aires, Argentina. Digital-recordings of mistakes made during MED-training sessions, in cases where MED use was indicated (simulated ventricular fibrillation or pulseless ventricular tachycardia clinical cases), were collected. The studied population included all the participants in the pediatric emergency high fidelity clinical simulation training sessions held at the SIMMER center. The observation interval was 2 years (June 2014–May 2016). MED-use mistakes had to be visually and photographically evident in order to be recorded as such.

Results: During the 2-year interval, 72 meetings were held, including 302 simulated cases and involving a total of 648 physicians. Of all the participants, 446 (68.8%) were resident physicians. The total of simulation sessions amounted to 72 (i.e., 72 groups of physicians), and 7.4% of the physicians (distributed among 8 groups) made evident mistakes. Non-life-threatening mistakes retrieved during the debriefing sessions, regardless of the efficacy of the maneuver to recover the appropriate (sinus) heart rate or the proper care of the medical devices, are recorded below:
- Dose (Joules/Kg): No dose mistakes related to the defibrillator charge or shock intensity were found in general.
- Paddle–skin interface: Failure to use conductive gel was reported for a majority of situations.

Discussion: Although the study involved simulation situations, concern was raised among both trainees and trainers that the results might mirror those of real-life procedures, considering the high fidelity character of the simulations.

Conclusions: MED use mistakes during pediatric emergency simulations are not infrequent in our environment. This conclusion should lead healthcare institutions to periodically consider this issue and provide training possibilities, because the risk of serious injury may be important.

PO 17-3 - Fatigue During Cardiac Compression Exercise Using Neonatal Patient Simulators
Submission ID: IPSSW2017-LS-12

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Introduction: Although rarely required, appropriate performance of cardiac compression (CC), where indicated, is critical for the newborn good prognosis. Adult and pediatric patient simulator studies have shown that CC quality is decreased over maneuver time. Except in newborns, the rescuer should be replaced every two minutes. No mention was found in this respect within the current neonatal resuscitation guidelines. Purpose: To monitor the quality of cardiac compression and the rescuer’s physical exhaustion when quality compression is applied together with ventilation on a neonatal simulator.
Population and Methods: Prospective observational experimental study on physicians and nurses frequently delivering newborns who have signed the informed consent. Subjects physically handicapped for the proposed task were not eligible. The simulator used was Laerdal Resusci Baby®QCPR®. Quantitative measures were retrieved through a HeartStart MRx monitor. The device depth and rate were appropriately calibrated for neonatal patients. Subjects were indicated to perform CC continually for 10 minutes at a 3:1 ratio respective to ventilation, which was applied by another caregiver. The statistical measures comprised basically descriptive statistics (mean, median, as suitable, range, and standard error). Comparisons were made using a square Chi test, considering a p < 0.05 significance value.

Results: 40 subjects participated and 62.5% of them were women. 21 (52.5%) evidenced weariness, as they performed not less than 4 compressions on a row below the appropriate standard (33 mm), and continued to perform low-quality CC. No gender-based differences were found in weariness, although differences were found in the mean CC depth (37.9 mm for women, compared to 40.1 mm for men). Subjects who did aerobic exercise had a significantly better performance compared to those that did not. Mean time-to-interruption among those who got tired or interrupted CC performance was 7.7 minutes (min: 3.5; max: 9).

All the subjects would rather have been substituted with another rescuer before the 10 minutes.

Conclusion: A decrease in the quality of the cardiac compression and an increase in the rescuer’s weariness are very frequently found before 10 minutes performance on a simulator. It might be advisable to have the rescuer be substituted during long resuscitations.

References:

PO 17-4 - Creation Of Multi-Disciplinary Simulation To Increase Team Competence And Decrease Time To Ecmo Cannulation
Submission ID: IPSSW2017-LS-16

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Background: Extracorporeal cardiopulmonary resuscitation (ECPR) is an essential, lifesaving therapeutic service provided by most modern cardiac intensive care units. Successful outcome after ECPR depends on a coordinated multidisciplinary effort leading to deployment onto extracorporeal life support in the shortest possible duration, with minimal procedural disruptions while maintaining adequate quality of cardiopulmonary resuscitation. ECPR is an extremely stressful clinical intervention. The infrequency of ECPR necessitates continuous education of all involved personnel to attain a level of preparedness that would ensure optimal ECPR when the situation is actually encountered in the unit. We have designed and implemented a novel, structured protocol-based educational tool for patient care providers utilizing simulation-based training sessions to develop and maintain competency in ECPR.

Methods: The simulation protocol was designed with specific, realistic, and achievable learning objectives. The goal of the simulation was to familiarize bedside staff with the process of initiation of ECPR, the patient and room set up necessary for uneventful cannulation, and the various ancillary paraphernalia required for the procedure. Emphasis was also placed on the importance of role-based communication during ECPR to minimize the chaos that is often seen during a sudden, unanticipated life-threatening patient event. The protocol was finalized after receiving input from the bedside staff, as well as the educators, to maximize the yield from these sessions. A trial practice session was conducted to assess feasibility and flow. Each session was intended to start with a pre-brief presentation. This was followed by the actual simulation of an ECPR scenario. A formal debrief concluded the training session. All participants were provided with a feedback form to share their opinion on the usefulness of these simulations and to suggest possible improvements.

Results: Two of the six planned sessions for 2017 have been completed thus far. All nurses in the cardiac intensive care unit are required to attend at least one of these sessions this year. Twenty-eight nurses who participated in either of the two sessions provided their feedback. Of the respondents, 93% rated the simulation experience as “very good” or “excellent”. Various areas of improvement have been identified, including a more
structured debriefing procedure, more focus on non-technical skills, and ensuring inclusive presence of all disciplines involved in ECPR to make the training more team-oriented.

**Conclusion:** ECPR simulations were well-received by the intended audience. However, the details of team training sessions require refinement. The planning committee intends to continue the simulations with a sustained iterative approach to provide the best training environment to promote improved communication skills, excellent teamwork, and skill mastery. The ultimate goal of the simulations is to provide a learning environment which will lead to improved communication, interdisciplinary collaboration, and task/skill mastery that will correlate with improved ECPR outcomes.

**PO 17-5 - Maximizing efficacy of simulation-based training: Rapid Cycle Deliberate Practice vs Traditional Simulation**

**Submission ID:** IPSSW2017-LS-26

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**Introduction:** Simulation based medical education (SBME) is an effective educational tool in a range of medical disciplines. Elements of feedback and repetitive practice have been shown to be features of SBME that lead to effective learning. Rapid cycle deliberate practice (RCDP) is a novel strategy that combines these essential features, thus may be superior to traditional SBME. In this work-in-progress we are exposing anesthesiology trainees to simulated operating room emergencies and seeking to describe and compare the performance enhancement conferred by RCDP versus traditional SBME. As secondary outcomes we are studying retention and transferability of the two techniques.

**Methods:** Anesthesiology trainees at a university-affiliated teaching hospital are offered pediatric anesthesia emergency SBME as part of their regular curriculum. With REB approval, during the study period learners are randomized to receive that teaching in one of two formats: RCDP or traditional (where a scenario is conducted uninterrupted and debriefed at the end). As RCDP is a novel teaching strategy there is currently no data to suggest effect size or spread, so for this pilot study we have used a convenience sample of 40 participants. We conduct knowledge transfer scenarios immediately after the teaching and retention and transferability scenarios at six months. These performances are videoed and scored by trained expert raters using scoring instruments for which we have previously published validity evidence in this context. We are also collecting Kirkpatrick level one data on learner acceptability and perception of impact, given that this is a novel teaching strategy.

**Results:** In this work-in-progress we have implemented the RCDP program and collected preliminary data from learners, 100% of whom have rated the teaching method as effective or highly effective.

**Discussion:** RCDP is a novel form of SBME that offers potential advantages to traditional methods by combining essential components of feedback and repetitive practice. In this pilot study we have demonstrated that RCDP is an acceptable alternative to traditional SBME and further will be able to describe impact on performance and knowledge retention. Further research is needed to investigate if RCDP compared to traditional SBME leads to improved objective measures of trainee performance.

**PO 17-6 – Simulation Based Assessment of Advanced Airway Cart Placement in a Pediatric ED**

**Submission ID:** IPSSW2017-LS-18

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**Context:** The Seattle Children’s Hospital sees hundreds of airway foreign bodies every year. The management of this problem involves multiple hospital staff members, including emergency department physicians and Otolaryngologists. Fortunately, the majority of airway foreign bodies do not present in a life-threatening state and allow for time to transfer to the operating room for a formal airway foreign body removal. However, in certain tenuous clinical circumstances, there may not be sufficient time to transfer to the OR, particularly at night when a full complement of OR staff is not readily available in the hospital. This perpetuated the clinical question of whether it would be clinically efficacious and useful to introduce advanced airway equipment to a tertiary care pediatric ED.

**Description:** To address this clinical question, we performed in situ-simulation. In the first iteration, participants performed the scenario with the existing system of care and then with the proposed rigid bronchoscopy airway cart in the ED. In the second iteration, the scenario order was reversed. The scenario involved foreign body (FB) aspiration in a child resulting in progressive airway obstruction in the ED. Objective outcomes such as time to airway stabilization (FB removal or successful right mainstem intubation) were documented. We also surveyed participants about their experience in the simulations and their opinions on the placement of advanced airway equipment to the ED.

**Observation/Evaluation:** In the existing system, average time to airway stabilization was 14 minutes. With the proposed advanced airway equipment, time to stabilization was 12.5 minutes. Subjective outcomes demonstrated that 62% of participants agreed or strongly agreed that advanced airway cart placement in the ED would be beneficial, and when asked in reverse, 12.5% preferred the current system. Ninety-two percent of participants agreed that simulation was an effective method for learning and process improvement and 75% of participants felt this scenario helped to better inform their clinical decision making.

**Discussion:** Simulation based assessments are an effective means to evaluate potential implementation of advanced airway equipment in a tertiary care children’s hospital ED. Based on objective and subjective outcomes, consensus supported introduction of an advanced airway cart at our institution. This process allowed us to effectively evaluate a proposal using simulation, arrive at a consensus, and begin the steps towards implementation. Simulation allowed for realization of unforeseen obstacles that can be addressed as this set of equipment is introduced.

**PO 17-7 - Optimizing the operational process during In-Situ Simulation using a web based automated data entry system**
Submission ID: IPSSW2017-LS-19

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**Background:** The simulation center at Texas Children’s Hospital expanded a Comprehensive In Situ Simulation Program to four critical patient care areas, including NICU, PICU, CVICU and ED. We routinely carry out In-Situ simulations within each unit during day and night shifts. Target participants include a multi-disciplinary team working in each clinical area during day and night shifts. Integration of simulation in an already busy clinical environment represents a challenge, as the target participants are often “too busy”. The allocated time to participate in the sessions is limited to 30-45 minutes including time needed for signing in to track attendance, introduction to a safe learning environment, participation in a simulated scenario, and post simulation debriefing. Our experience has resulted in limitations in tracking simulation metrics and improving the quality of the educational experience due to the lack of data.

**Hypothesis:** Development of an automated data entry computer system for use during In-Situ simulations is an effective and efficient tool to improve time management and to keep accurate attendance record.

**Methods:** We sought to develop an automated data entry computer system by the Texas Children’s Hospital IS Business Applications Department. The system is a custom .NET web application built for both desktop and mobile devices that captures simulation session data, class rosters, uploaded documents, and surveys in a
centralized online database. It automates the paperwork that was being filled out by staff for each session; and with data being stored online in SQL Server, all simulation data across the organization is made instantly available. The system also integrates with our active directory so it is able to automatically populate user specific data without requiring people to enter it themselves. The simulation instructors received a training session on the use of the computer system and were encouraged to report any encountered difficulties or suggestions for improvement. Feedback was also sought from the healthcare workers who participated in the sessions prior to implementation of the pilot trial.

Results: A pilot trial was implemented in the NICU from January 2017 to April 2017. Qualitative feedback from the simulation instructors and participants were collected to refine the system and facilitate its use. We observed improvement in the workflow and reduction in the time required to gather the participants’ information from ~15 minutes to < 5 minutes, that greatly impacted the actual simulation and debriefing process. It allowed us to keep accurate record of the details of each simulation session, including time spent, learning objectives met, attendance of learners, and session/instructor evaluations. By being built in-house and customized to Simulation Center workflows, the system can easily be modified and grow without licensing costs to the simulation program.

PO 18-1 - Field Test Of Gps Patient Trackers In A Simulated Mass Casualty Event: A Feasibility Study
Submission ID: IPSSW2017-LS-20

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Introduction: Knowing where individual patients are in real time during disasters relies on radio communication to an incident command. This information is not available to all providers and may be of poor quality. Tracking of patients across the continuum from field triage to EMS to hospital staff would provide situational awareness to all providers thus improving triage and treatment decisions. The goal of this study was to facilitate patient tracking for emergency personnel, hospital staff, and the incident command center.

Methods: This study was conducted during our annual disaster drill simulating a plane crash at a regional airport, in which 46 pediatric patient actors portrayed disaster victims. The study sites were Tweed Airport and Yale-New Haven Hospital Pediatric Emergency Department (YNHH PED) that are located 4.3 miles apart. Real ambulances, roads, modes of transport and emergency medical service providers were used. 20 of the 46 patients were transported to YNHH PED. Prior to the drill, GPS devices were affixed to 12 of the patient actors by the investigators (Figure 1). At YNHH PED, nurses, attendings, and fellows accessed a map through an application that provided real time geolocation of patients as they were transported from the scene to the hospital. The outcome was staff perception of the utility of the GPS device assessed via Likert scale questionnaire, free text feedback from staff, as well as event debriefing observations.

Results: The questionnaire about staff perception of the GPS tracker use was completed by 13 nurses, 2 Pediatric Emergency Medicine (PEM) attendings and 1 PEM fellow. Overall, the GPS tracker was perceived as an advantage for patient care. Staff reported that the device allowed them to see the real time location of the patients on the application and staff saw the GPS tracker as safe to use on pediatric patients. The most challenging part was the mobile application navigation (Figure 2). All participants would support tracker implementation if they were on a decision-making committee. Of the 12 patients with trackers, for 5/12 staff received a radio patch while for all 12 the GPS was noted to allow for real time tracking and improved situational awareness

Discussion: GPS trackers could be helpful tools to improve estimated arrival time accuracy, avoid missed patient radio communication, and improve staff members’ situational awareness. The GPS trackers were well perceived and thought to be helpful. Moving forward to the next study phase, we are planning to use a more sensitive GPS device that may include an audible component for communication between EMS and ED staff providers during the continuum of care.
Conclusion: GPS trackers improved real time tracking and thus could improve disaster triage care. Further studies are warranted after this initial feasibility pilot study to investigate the optimal use of GPS trackers in disaster settings.

Figure 1: Simulated patient actor with GPS device attached.

Figure 2: Screen shot of the application tracking a patient in real-time
PO 18-2 - Preparing For Rare Intraoperative Emergencies: Pediatric Massive Transfusion Protocol
Submission ID: IPSSW2017-LS-21

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**Background:** Massive transfusion in the pediatric surgical patient is relatively uncommon but when it occurs (eg trauma, post-operative hemorrhage), requires the coordination of anesthesia, surgical and perioperative staff in a time-sensitive manner. We aspired to improve our perioperative staff’s competency in a P-MTP scenario via a simulation and teaching stations to best prepare our team for this rare critical event.

**Research Question:** How many of our perioperative staff knew how to initiate the P-MTP and how to conduct it and thereafter how much improvement was shown after a P-MTP simulation and teaching stations.

**Methods:** First, the pediatric perioperative staff (registered nurses, surgical technicians, anesthesia technicians) were surveyed to assess for experience, familiarity with our P-MTP, experience with a P-MTP situation, knowledge of how to initiate and halt our P-MTP and where our emergency intra-osseous (IO) kit is located. After this, a P-MTP simulation was conducted consisting of a pediatric trauma patient in hemorrhagic shock with poor venous access. Following the simulation, a teaching session was held. Participants then completed a post-simulation survey to assess the simulation and teaching session.

**Results:** Pre and post surveys data. 13 staff completed the pre-survey and 12 completed the post-survey. Pre survey data: Staff experience (reported as total number): 0-3 years (4), 4-6 years (4), 6+ years (5). Familiarity with P-MTP: 23%, Prior experience with the P-MTP: (15%). Baseline comfort in assisting with a patient undergoing P-MTP: uncomfortable (54%), somewhat comfortable (38%), very comfortable (7%). Knew how to activate the P-MTP: (8%). Knew where the IO was located: (0%). Selected post survey data: Knew how to activate the P-MTP: (100%). Knew where the IO was located: (92%). Comfort in assisting with a patient undergoing the P-MTP: very comfortable (88%), uncomfortable (12%).

**Discussion:** Simulation can be and effective tool to prepare for rare critical events in the operating room and allowed us to identify significant gaps in knowledge surrounding team resuscitation of a pediatric patient requiring the P-MTP. We demonstrated a level of unfamiliarity and discomfort with the P-MTP amongst our perioperative staff which improved following our simulation and teaching session. Future steps include expansion of our training program to other locations utilizing the P-MTP and further simulations to improve our teams.

**References:**

PO 18-3 - Simulation-Based Training For Intermediate Care Level Patients In Pediatrics
Submission ID: IPSSW2017-LS-22

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**Context:** A formal model of care for Intermediate Care (IC) level patients was implemented on the General Pediatric inpatient ward in July 2016 to address the increasingly complex needs of our medical inpatients, while
optimizing patient flow from the Emergency Department, critical care areas, and from our external partners. IC patients are those who require more intensive care and monitoring than that typically provided in an inpatient ward setting, but do not require care in a critical care unit. The pediatricians and nurses who work in IC may have maintained certification with generic life support courses or participated in mock resuscitation sessions, but such experiences may not be consistent or entirely relevant. A comprehensive program specific to our needs was developed to ensure advanced competencies in teamwork, communication, assessment and management.

**Description:** Several graded educational interventions with simulation incorporated as a key component were developed to maximize experiential and relevant learning with guided reflection in the debriefs.

1. **IC Refresher Day** – a one-day event for nurses that utilized case studies, task trainers and hands-on practices to review the available resources, equipment, assessment and management skills, and emergency procedures and communication tools.

2. **Resuscitation Modular Program** – a one-day event with simulation for teams of pediatricians and nurses with emphasis on early identification and management, and crisis resource management skills.

3. **In-situ mock code simulations** – longitudinal multidisciplinary sessions on the ward designed to depict an actual currently admitted IC patient with anticipated real pre-arrest or arrest situation, with emphasis on situational awareness and contingency planning. Observed assessments for knowledge and skills in the management of two simulated scenarios were completed within one year of the education.

**Observations:** The sessions were mostly interprofessional with over 80 participants for the Refresher Day and Modular Program and over 40 participants in seven in situ simulations. The evaluations for all sessions were rated highly for relevance, usefulness and applicability. The courses were layered for their level of complexities with emphasis on teamwork and incorporation of local practices. The assessments showed IC staff demonstrated a more thorough respiratory assessment that led to an emergency tracheostomy and they demonstrated increased accuracy in push-pull method in sepsis management compared with colleagues who had not had IC education.

**Discussion:** A comprehensive, resource-intensive, specially designed simulation-based program that addressed the needs in our hospital ensured competencies in acute care resuscitation to support the implementation of IC. Ongoing continuing education program that reflect emerging issues and ongoing needs maintained competencies for patient care on IC.

**PO 18-4 - Standardized Patient Simulation To Develop Communication Skills In Difficult Conversations**
Submission ID: IPSSW2017-LS-23

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**Background:** Navigating difficult conversations is an expectation of Pediatric practitioners upon completion of graduate medical education (GME). Often however, clinical experience during residency does not, on its own, adequately prepare residents to confidently engage patients and families in difficult conversations. In addition, even when ample clinical opportunity is present, feedback regarding success and opportunities for improvement from colleagues and, in particular, families and patients on how a resident managed a difficult conversation may not be readily available.

**Research Question:** We sought to evaluate if a simulated patient (SP) workshop involving difficult conversations would improve resident comfort with difficult conversation scenarios while educating pediatric residents on specific communication tools, tenets from culturally effective healthcare and inter-professional team work in a peer-focused environment.

**Methodology:** Residents were divided into peer groups of four. These groups rotated through two SP stations. Each station consisted of one faculty supervisor and one SP trained on enacting two distinct difficult conversation
scenarios. These scenarios included disclosure of LGBTQ status, discussion of an exam concerning for physical abuse, delivering the diagnosis of ambiguous genitalia in a newborn and introduction of palliative care services. Peers within the group and the group faculty facilitator observed an individual resident’s interaction with the SP caregiver. At the completion of each scenario, faculty provided formative, on-the-spot, feedback, and aided in peer observer led debriefing in addition to direct feedback from the SP. Faculty also provided education regarding specific skills or resources relevant to each case scenario and each resident’s specific performance. Residents completed a survey focusing on self-efficacy surrounding the skills targeted by the SP workshop both prior to the start of and following completion of the workshop. The post-workshop survey also included questions regarding workshop design, SP contributions to the residents’ overall training in GME and overall SP workshop satisfaction. Unpaired t test performed to compare pre- versus post-workshop surveys.

**Results:** Pre- versus post survey responses showed statistically significant increases (p>0.05) in comfort and confidence in engaging families for all cases except LGBTQ case. Resident self-reported perception of the workshop showed overall positive value of peer, faculty and SP interactions.

**Discussion/Conclusions:** A workshop utilizing role-playing with SP’s and subsequent peer, SP and faculty feedback can instill greater confidence and better equip our trainees to address a variety of difficult topics and conversations. Case style revisions or additional content education may be necessary for case topics less familiar to resident such as LGBTQ.

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**PO 18-5 - A Novel Simulation-Based Ultrasound Curriculum**  
Submission ID: IPSSW2017-LS-24

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**Context:** Ultrasound (US) imaging technology has moved out of the realm of radiologists and technicians and into the hands of bedside clinicians. US is useful for guiding specific procedures such as central, arterial, and peripheral vascular access, thoracentesis, and paracentesis with dramatic improvements in patient safety. In addition, bedside US is consistently used in emergency departments to evaluate trauma patients in real-time and is increasingly being used across ICUs to evaluate unstable patients. US is non-invasive and can give useful, immediate information regarding cardiac function, lung function, and intra-abdominal processes, and the information gleaned often guides therapeutic and resuscitation decisions. Despite these benefits, US training is currently only a standard element in emergency medicine training and has not been required in other medical training specialties. In addition, it can sometimes be difficult to find enough willing patient participants for practice in a busy ICU and this methodology does not allow for consistent standardized practice. Our goal was to develop an ultrasound curriculum for Pediatric Critical Care Medicine fellows using simulation to augment live patient encounters.

**Description:** At the beginning of training, each fellow was assigned a SonoSim® handheld device and a registered ultrasound training account. The simulation device allowed the fellow to practice how to hold the probe and obtain proper views for each study before approaching a patient. In addition, program leaders were able to track progress by overseeing their accounts for performance on knowledge assessments and practical training.  
Observation/Evaluation: The fellows began performing supervised studies on live patients after having this opportunity to practice with the simulator - a no-risk, standardized training tool. The fellows acquired 25 cardiac, 25 lung, 25 FAST and 25 procedural exams, which were all quality-controlled by a physician who was certified in bedside ultrasound. This was accomplished during their primary service months but also during three dedicated one-month long imaging rotations spread over the three years of fellowship. At any time during this process, fellows would return to the simulator technology to refresh skills or to potentially acquire new skills not required by the curriculum.

**Discussion:** By the end of this three-year curriculum, each trainee was able to use the simulation technology followed by live patient interactions to accrue enough imaging experience, as demonstrated by their verified acquired images, that they will be able to be certified in critical care ultrasound. This will have been made possible by the use of a hybrid training curriculum that leverages simulator technology.
PO 18-6 - Tele-Co-Debriefing As An Initial Step For Tele-Curriculum Development For Simulation Faculty In Latvia
Submission ID: IPSSW2017-LS-27

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Introduction: Debriefing is one of the core elements of simulation-based training. Currently, the availability of training in debriefing is limited in many parts of the world. Developing debriefing skills typically involves either self-directed learning and/or traveling to a simulation centre abroad. Additionally, there are limited opportunities for ongoing feedback and debriefing skill development for faculty members. As a first step of developing a tele-curriculum for simulation faculty development in Latvia, we explored the feasibility of using a tele-co-debriefing model (a remotely located international colleague co-debriefing and debriefing-the-debriefer).

Methods: One simulation instructor in training from Riga Stradins University in Latvia co-debriefed with one simulation instructor from Yale School of Medicine. 14 Latvian pediatric residents participated in three different scenario simulations in Riga Stradins University Medical Education Technology Centre. The simulations were observed and the debrief was led by the simulation instructor from Yale via Skype modelling a debrief for the instructor in training from Riga. After the tele-debriefs a structured feedback was obtained from the residents in four categories: Instructors, Emotions, Technology, and Tele-debriefing.

Results: Three simulation sessions were run successfully from Connecticut in Latvia together with local faculty. Feedback by pediatric residents showed that English was not an obstacle for simulations, debriefing or learning for Latvian trainees. Tele-debriefing was valued as good as in-person debriefing and participants reported that having an international instructor was a great asset to the simulation. However, areas for improvement were identified: sound quality was particularly important for the learning and stress level was high among the participants. The simulation instructor in training perceived the simulation instructor from Yale modelling a structured debrief as helpful, the learning environment via Skype was perceived as appropriate and the Latvian instructor felt more confident and prepared for consecutive debriefs.

Discussion: We explored transcontinental tele-simulation and tele-co-debrief as a first step of remote simulation faculty development. We are planning to further investigate the use of tele-co-debriefing as a method to teach debriefing via tele-presence on the example of Riga Stradins University. The next step will be to continue co-debrief with predominantly modelling structured debriefs for the international simulation trainee accompanied by theoretical learning modules and self-directed readings of the relevant literature. The next phase will be to transition from tele-debriefing to in person debriefing with supervision and meta-debrief by the international instructor using the DASH to monitor improvement over time. This project is an example of how technology can be used to facilitate simulation instructor training for areas of where no simulation courses are available, where resources are limited, or where faculty members are unable to travel.

PO 18-7 - Simulation For Workflow Design Of The Automated Medication And Supplies Unit In Pediatric Anesthesia
Submission ID: IPSSW2017-LS-17

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Context: Introduction of a new technology in the operating room (OR) creates new workflows which can result in unidentified risks and impact on patient care. Despite careful workflow design, different environments may present unique and unanticipated challenges. This project aimed to use simulation to identify workflow processes and safety threats prior to the introduction of the Omnicell Anesthesia Workstations with the Codonics Safe Label System (AWS) in the OR for clinical use.
Description: Approval for study was obtained from Quality Management Department. The scenarios were designed with consideration of the usual workflow processes used by pediatric anesthesiologists. Scenarios were constructed to incorporate routine and emergency situations including transitions of care, medication dilutions, reconciliation of medications and removal of necessary supplies. Simulations were conducted either in the laboratory or in different real work locations, with or without a mannequin and vital signs monitor. This was determined by availability of resources and emerging themes. Anesthesiologists of different levels and subspecialties were involved after an orientation to AWS. Debriefing was conducted with a standardized debriefing tool. After implementation of the AWS, all anesthesiologists were invited to provide feedback by email or direct communication. The project team was on site to observe processes. Follow-up was conducted using a semi-structured interview from key participants. Notes taken were transcribed for thematic analysis.

Observations: The simulations identified the optimal process by which supplies and medications including narcotics were dispensed, diluted and labeled. The layout of the medication trays and the supplies were improved. Additional considerations were made to the power-down process. The information gained was utilized to develop an orientation program that incorporated these refinements. After introduction of AWS in the OR only two workflow concerns were raised that related to the location of the sharps container and barcode identification of patients. With respect to the design of the simulation, the use of the mannequin with vital signs were not necessary but improved realism and engagement for some participants. In situ simulation was not essential but highlighted considerations related to local environment.

Discussion: Simulation revealed potential risks associated with the AWS and changes were made to mitigate them prior to use with real patients. The orientation program was optimized based on findings from the simulation. Participants gained familiarity with the hands-on experience. Other end-users had increased confidence as simulation testing had taken place. Repeat simulations in multiple settings expedited the change processes. While early simulation may inform development of the technology, it is equally important to test the exact end product and avoid the need for extensive alterations after implementation.

PO 19-1 - Advancing Simulation Facilitation And Debriefing Through Strategic Curricular Integration
Submission ID: IPSSW2017-LS-25
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Background: In a national 2015 survey of Pediatric Emergency Medicine (PEM) fellowship program directors, 77% of responding programs had fellows lead simulation based teaching sessions, however, only 26% had a debriefing curriculum. Fellowship has been identified as an ideal time period for the development of simulation instructor skills. Traditional simulation facilitation and debriefing courses held at simulation centers commonly involve up to five days of coursework, curricular time which may not be available for all fellows. In addition, some content of a typical simulation instructor course is redundant to existing components of a PEM fellowship curriculum. As a structured approach to simulation faculty development has been cited as key to sustaining simulation centers and ensuring the quality of simulation based-education, improved fellow training in facilitation and debriefing would be of value.

Research Question: The aim of this study is to determine the effectiveness of a new simulation facilitation and debriefing workshop series for fellows that minimizes additional required curricular time by strategically building upon existing components of the fellowship curriculum.

Proposed approach to addressing the question or goal: Implementation of a new curriculum consisting of a series of three strategically targeted workshops, utilizing established methodology, will address the identified educational gaps in the simulation facilitation and debriefing skills of PEM fellows at our institution. Curricular effectiveness will be determined objectively by assessments of videotaped teaching using an established rating scale and subjectively by participant surveys. To evaluate the fellows’ capabilities as instructors, they will be
videotaped teaching residents prior to and after completion of the curriculum. These videos will be reviewed by members of the research team and scored using an established, validated tool, the Debriefing Assessment for Simulation in Healthcare (DASH). Residents who participate in the fellow-led sessions will complete DASH - student evaluation forms of their facilitators. Fellows participating in the curriculum will complete the DASH – instructor version, self-reflecting on their performance. Surveys will be completed by fellows prior to and following participation in the workshop series. Information learned from implementation of the pilot phase will be used to modify the curriculum.

Conundrum or difficulty encountered:
- Prioritizing content areas for inclusion in the workshop series
- Anticipating participant preferences in workshop session practice activities
- Determining impact of curriculum given small sample size

Questions for discussion:
Is the DASH the best tool to assess fellow facilitation and debriefing skills?
What is the optimal format for delivering workshop content?
How can retention of acquired simulation instructor skills be assessed?

PO 19-2 - Design Evaluation Of A Novel Female Infant Urinary Catheterization Simulation Trainer
Submission ID: IPSSW2017-LS-28

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Context: Urinary catheterization in infants presents many issues as described by medical professionals. The genital anatomy of infants is smaller than in adults and can cause difficulty in placement of a foley catheter. In the female infant it can be difficult to gain visual surety of the urethral opening due to the complex external anatomy, in males it can be difficult to line up the opening of the urethra with the opening of the foreskin. If performed incorrectly, a ‘false passage’ can be created if the catheter punctures the wall of the urethra. This leaves the infant susceptible to infection and inevitable pain. In both genders, urinary catheterization must be performed with sterile technique to prevent catheter associated urinary tract infections (CAUTIs).

Description: Resources for practicing infant urinary catheterization technique in a simulation environment are limited by relatively low-fidelity part-task trainers made from haptically inappropriate materials. Considering these limitations and the consequences of incorrect or non sterile technique the principle author of this poster employed skills from experience as a practical Special Effects Designer, position in the SIMPeds Engineering team and Boston Children’s Hospital to create a female urinary Foley catheterization simulation model. With the consistent input of Clinical champions the trainer was originally developed as a modular component for the 'Life form' infant catheterization trainer distributed by Nasco. Careful attention was paid to the pertinent internal and external anatomical features and the texture, density and strength of the materials used to simulate the various tissues.

Observation & Evaluation: Qualitative feedback and Professional Medical Practitioner feedback on Design & usability will also be gathered regarding the female components. The design features were informed by medical professionals and will be evaluated using a 0 to 6 Likert scale where a score of 6 will be considered the most satisfactory in the categories of visual, tactile and haptic realism, noting cues.

Conclusions: This study describes the design successes and limitations of a novel preliminary modular component for an infant catheterization task trainer. Evaluative Information is intended also to inform the Development of an equivalent male Infant Simulation Trainer.

References:
(Todsen et al., 2013)
(Lewis, 2014)
(Manzano et al., 2014)
PO 19-3 - A Parental Self-Efficacy Tool In Tracheostomy Care: The Development And Validation Of An Instrument
Submission ID: IPSSW2017-LS-29

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Background: Tracheostomies in infants and children are associated with significant risks of mortality and morbidity, most commonly tube obstruction and accidental dislodgment. Tracheostomy education is an essential part of pre-discharge planning in children with new tracheostomies. High-fidelity simulation has been shown to augment education for hospital staff.1 Proper education has the potential to decrease out-of-hospital events. Self-efficacy is a person’s context-specific sense of confidence in his or her ability to perform a particular behavior.2 Self-efficacy can be a proxy for competence because it has been show to directly correlate with performance.3 Evaluation of a caregivers’ preparedness for discharge is a common challenge for providers. A well-validated tool to measure caregivers’ competence is critical to determining readiness for discharge. It allows the measuring of effectiveness of a discharge educational program including high-fidelity simulation.

Research Question: Develop and validate a tool measuring parental self-efficacy in caring for children with tracheostomies.

Methodology: We created six domains of tracheostomy education and care based on four psychological processes of self-efficacy. Using the modified Delphi method, content experts representing critical care, neonatology, psychology, family advocacy, and clinical nurse education winnowed questions over multiple rounds to establish content validity. Parent Advocates with tracheostomy care experience were then used to confirm content validity. The preliminary tool was comprised of 26 questions over six domains, and administered to parents of children with a new tracheostomy and to experienced parents (children with tracheostomies >6 months) to determine response process. Subdomain scores were computed as the average of all responses to the questions within each subdomain and were then compared between experienced and new parents using the Wilcoxon rank sum test.

Results: 60 participants underwent inclusion in the study, separated into two arms. 32 new parents and 28 experienced parents completed the tool. There were significant differences between experienced and new parent groups in the domains of knowledge, emergency, performance, situation, coping, and total score. The p-values were 0.0129, 0.0001, 0.0001, 0.0166, 0.0156, and 0.0001, respectively. The score on "Goals" was not significantly different (p=0.4213).

Conclusion: We systematically developed a tool to measure parental self-efficacy for tracheostomy care. The tool possesses proper response process, content and construct validity. Additional studies to correlate tool scores with simulation outcomes will give further validation. This tool can be used to evaluate simulation efficacy in pre- and post-simulation scenarios.

References:
PO 19-4 - 2-Center Collaboration on Debriefee Training for Nurses
Submission ID: IPSSW2017-LS-30

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**Background:** Recently debriefing clinical events have been reported to have potentials to improve patient outcome. In order to make debriefing happen immediately after clinically significant events, a certain number of good debriefers are required at bedsides. In Japan, training courses for debriefing, especially the ones focused on pediatrics, are still few, though simulation trainings have been disseminated. Currently the majority of “active” debriefers in children’s hospitals in Japan are presumed to be physicians and we need to train nurse debriefers playing important roles to have nurses express their opinion more freely.

**Educational Goal:** The trained nurse debriefers will debrief in a non-threatening, systematic and structured way at regular simulations and clinical events.

**Proposed approach to addressing the goal:** As a starting point, we developed one-day nurse debriefer course through collaboration between Aichi Children's and Kobe Children's. Only physician instructors are available at this moment. Our participants are nurses from pediatric intensive care units for now. After the training course, the nurses are supposed to have continuous training at each hospital, through debriefing of regular simulations and clinical events with supports from physician debriefers.

**Conundrum or difficulty encountered:** The first course will be held in the middle of May, 2017. The encountered challenge will be shared.

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PO 19-5 - A Needs Assessment for a Context Sensitive Pediatric Anesthesia Simulation Curriculum in Sub-Saharan Africa
Submission ID: IPSSW2017-LS-31

Vanderbilt Medical Center

**Context:** A child presenting for a simple surgical operation in Sub-Saharan Africa (SSA) has a higher rate of perioperative mortality than the same child presenting for the same surgery in the United States (US). Although pediatric perioperative mortality is poorly documented in low and middle income countries (LMIC), it has been estimated to be as high as 1 death per 144 operative cases compared to 1 per 100,000 in the US.1,2,4 In the year 2000 the Millennium Development Goals were adopted in efforts to address global inequalities with one of their goals by the year 2015 being to reduce the under 5 year old mortality by two thirds between 1990 and 2015. There has been little to no progress achieved to date in SSA specifically.3

Although anesthesia care delivered to the poorest children in the world is not well documented, there are several studies that highlight some common themes revealing the etiology of the disparity in perioperative mortality. These themes include challenges due to a lack of qualified or trained anesthetists, basic monitors, medical equipment, and drugs. Documented causes of anesthesia related intraoperative mortality in LMIC include: difficult intubation, laryngospasm, and bronchospasm all causing hypoxia leading to cardiac arrest.1 In regards to how to address this disparity in care, one of the recommendations has been context sensitive simulation.5

International simulation in low resource settings have proven they can impact neonatal morbidity and mortality in campaigns such as Helping Babies Breathe, where they disseminated simulation based neonatal resuscitation training to provide life saving resuscitation within the first few minutes of a neonate's life.6 Although these benefits have clearly been demonstrated, there remains little to no concrete guidelines for the development and implementation of clinical simulation scenarios in low resource settings. Simulation in low resource settings proposes unique documented challenges, with major cultural differences and limitations in human resources,
equipment, monitoring, and drugs preventing the ability to translate previously developed scenarios directly to the low resource settings. In a paper entitled, Using Simulation in Global Health, Pitt et al provided recommendations for using simulation in LMICs which included collaborating with providers familiar with the setting, aligning the in country simulations with local norms and resources, and using low fidelity simulation to more accurately represent their area of practice.  

**Description:** We performed a needs assessment for a pediatric anesthesia emergency simulation curriculum to be used for the student Kenyan Registered Nurse Anesthetists (KRNAs) at AIC Kijabe Hospital in Kijabe, Kenya. We collaborated with in country providers consisting of two KRNA senior educators at Kijabe Hospital, one African pediatric anesthesia fellow from Zimbabwe, and a pediatric anesthesiologist who founded the KRNA training program at Kijabe and has been practicing in SSA for over twenty years. 18 senior student KRNAs and 6 visiting distance learners who were practicing nurse anesthetists in other areas of SSA were relieved of clinical duties to participate in this simulation based education intervention. After approval from AIC Kijabe Hospital IRB, the participants signed informed consent and demographic data was gathered in the form of a pre-simulation survey. They all underwent a high fidelity simulated scenario of laryngospasm with induction of general anesthesia in a 16 month old child, then participated in a semi-structured co-debriefing led by one of the senior KRNA educators and one senior US anesthesia resident trained as a simulation instructor by the Center for Medical Simulation in Boston, Massachusetts.

**Observation/Evaluation:** After completing the pre-simulation demographic survey, 100% of the 23 participants reported that they would be providing direct care for children under general anesthesia in the facility they will practice in after their training is complete. The most common surgical specialties the participants reported providing anesthesia for included pediatric general surgeries, orthopaedic surgery, otolaryngology, and trauma with five participants reporting the practice of pediatric neurosurgery at their hospitals. Although all the participants would be providing general anesthesia for children as a routine part of their practice, only four participants would have physician anesthesia providers at their hospitals and only two of those four anesthesia providers would be trained specifically in the practice of pediatric anesthesia.

Information regarding the availability of intraoperative monitoring at their sites of practice was also gathered revealing only 22% having access to routine capnography, 61% to electrocardiograms, 78% to pulse oximetry, and 83% to blood pressure monitoring.

**Discussion:** A needs assessment for a pediatric anesthesia curriculum for the student KRNAs at Kijabe Hospital was performed with the long term vision for the high fidelity simulation center at AIC Kijabe Hospital to be used as a train the trainer center for nurse and physician anesthesia providers to be equipped in the management of simulation based education of pediatric intraoperative emergencies and be equipped with knowledge, skills, and low cost/low fidelity equipment to teach and lead multidisciplinary simulation based education on perioperative pediatric anesthesia emergencies in their home countries and hospitals. The information gathered in this demographic survey provided valuable information the need for increased education on the management of life threatening pediatric anesthesia emergencies and insight in regards to how to develop pediatric anesthesia emergency simulations that are context sensitive and most effective.

All simulation scenarios at Kijabe hospital currently being used are with the use of EKG, Blood pressure, pulse oximetry, and capnography as monitors. After discovering that only 22% of the SSA anesthesia providers participating in the survey have access to routine capnography and only 61% have electrocardiograms, scenarios must be altered to use more physical exam and facilitator cues, and eliminate the use of monitors often unavailable. The next steps for curriculum development will be analyzing the qualitative data gathered in the semi-structured post simulation debriefing and collaborating with LMIC in country pediatric anesthesia experts to act on the combination of the pre-briefing demographic survey objective data and the common themes identified in the semi-structured post simulation debrief to develop a pilot of a pediatric intraoperative emergency simulation curriculum for LMICs.

In regards to the implications of the work for the pediatric simulation community, our health care colleagues practicing in LMIC settings without resources, without pediatric experts, and with advanced and late presenting pathophysiology need our support in equipping them to manage the global burden of preventable pediatric deaths. The use of simulation internationally in underdeveloped countries has been shown to impact neonatal...
morbidity and mortality in campaigns like Helping Babies Breath and it is reasonable to assume it has the potential to be used to decrease preventable anesthesia related intraoperative pediatric deaths.6

References:

PO 19-6 - The Validity of a Global Rating Scale and Checklist for Evaluation of Pediatric Laceration Repair
Submission ID: IPSSW2017-LS-32

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Background: The Accreditation Council for Graduate Medical Education has developed milestones including procedural skills under the core competency of patient care. Laceration repair is a procedure the Pediatric Residency Review Committee states residents should have training in, and progress in that training should be monitored by residency programs. There exists no validated tool to evaluate pediatric resident laceration repair performance.

Research Question: Does a novel tool for the evaluation of resident laceration repair performance in a simulated laceration repair in the Pediatric Emergency Department (PED) demonstrate validity and reliability as measured by concordance in scores across reviewers and alignment of scores with proxies for procedural skill?

Methodology: A novel tool was developed to evaluate PED resident laceration repair performance. It is based on the validated Objective Structured Assessment of Technical Skills, & consists of two components: a global rating scale (GRS) and a checklist. 30 pediatric and family medicine residents were filmed performing simulated laceration repair. Each video was evaluated by five Emergency or Pediatric Emergency Medicine physicians. Evaluators were blinded to the identity of the proceduralist. To estimate agreement between the evaluators, concordance correlation coefficients (CCC) were calculated for both the GRS and checklist scores. Average scores were calculated for each resident and compared across levels of training and laceration repair experience. For each item, score ranges were calculated for each proceduralist, and then the median range was calculated for each item.

Results: 13 interns, 4 second year, and 13 third year residents were filmed performing laceration repair procedures. The CCC showed fair concordance across reviewers for both the checklist (0.55, 95% CI 0.38-0.69) and the GRS (0.53, 95% CI 0.36-0.67). Scores for both tools improved with increased years of training and reported procedural experience (figures 1 &2). The median range of scores for each 5-point item on the GRS varied between 0.0-2.0.
Conclusions: A novel tool to evaluate resident laceration repair performance in a PED showed fair agreement across reviewers. Proceduralist scores improved by training and experience. The study tool is not precise enough for summative evaluation, but it may be useful to distinguish between trainees who have and have not attained competence in laceration repair for formative feedback. While there was fair variability between scores of reviewers, the gradient scoring of the GRS allowed item scores for each reviewer to provide a more refined evaluation than the simple binary checklist item scores.

Figure 1 - Global Rating Scores by Provider Experience