

KidSIM



Annual Report



2023 - 2024

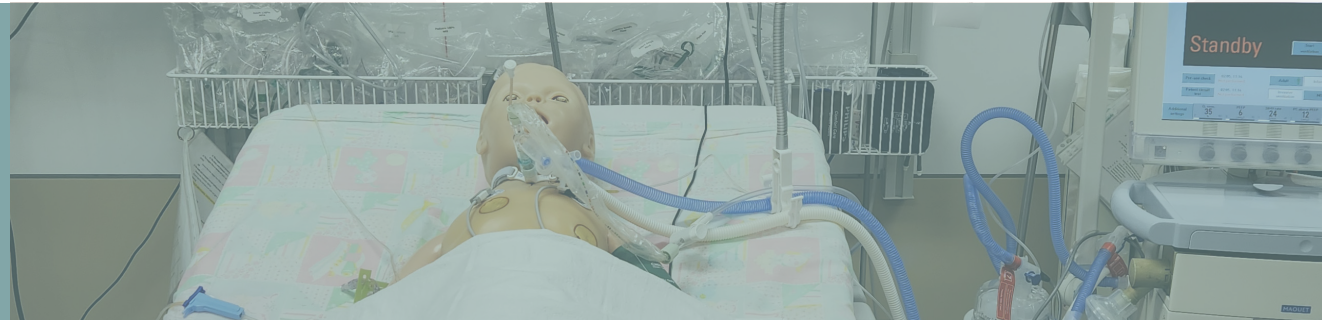


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KIDSIM PEDIATRIC SIMULATION PROGRAM

The KidSIM Pediatric Simulation Program based out of the Alberta Children's Hospital has been training health care professionals both as individuals and as part of interprofessional teams since October of 2005. Since that time, the KidSIM Program has trained over 75,000 learners and become a world-class program known internationally for delivering top-notch educational programs and conducting cutting-edge research. The KidSIM program works to provide learners surrogate clinical experiences with pediatric patients in as close to a 'real-life' situation as possible through the use of high-fidelity mannequins as well as a teaching space that mimics the clinical setting. Additionally, KidSIM provides education and support to help families, schools, and other non-clinical care providers to be better prepared for looking after children with high-risk medical situations that might occur outside the healthcare setting.

In 2022, the KidSIM Program was accredited for another 5 year term by the Royal College of Physicians and Surgeons of Canada. As an accredited simulation program, all activities developed and provided by KidSIM are automatically approved as accredited activities within the Maintenance of Certification (MOC) Program. The Royal College of Physicians and Surgeons of Canada established a formal accreditation system for simulation programs with the goal of building capacity in simulation-based medical education. Simulation program accreditation is a voluntary process that reflects a simulation program's ability to provide simulation-based education activities that model the highest administrative, educational, and ethical standards. Accredited simulation programs are internationally recognized as leaders in simulation-based learning and providers of activities that are planned and delivered according to the latest educational research to ensure patient safety and quality care provided by health professionals.

The KidSIM Program will honor our vision, mission & values by:

- Using medical simulation technology to enhance and assist with the ongoing professional development of front-line providers in our health care communities.
- Improving efficiency, availability and integration of simulation technology and scenarios into the educational programs of all pediatric stakeholders.
- Using medical simulation technologies to provide pediatric-focused acute care education and training to clinical areas within the ACH, as well as facilities that perform pediatric care in the Calgary Health Region, and rural and regional centers in Southern Alberta, Central Alberta and Southeastern British Columbia.
- Recruitment and facilitation of the training and development of future simulation educators providing a respectful, supportive and non-threatening learning environment for learners.
- Promoting excellence in simulation-based research by securing grant funding, mentoring novice researchers, collaborating with global experts, and engaging community partners to ensure broad dissemination of evidence.
- Creating an environment for improved patient safety and quality of care through uncovering and addressing patient safety threats.

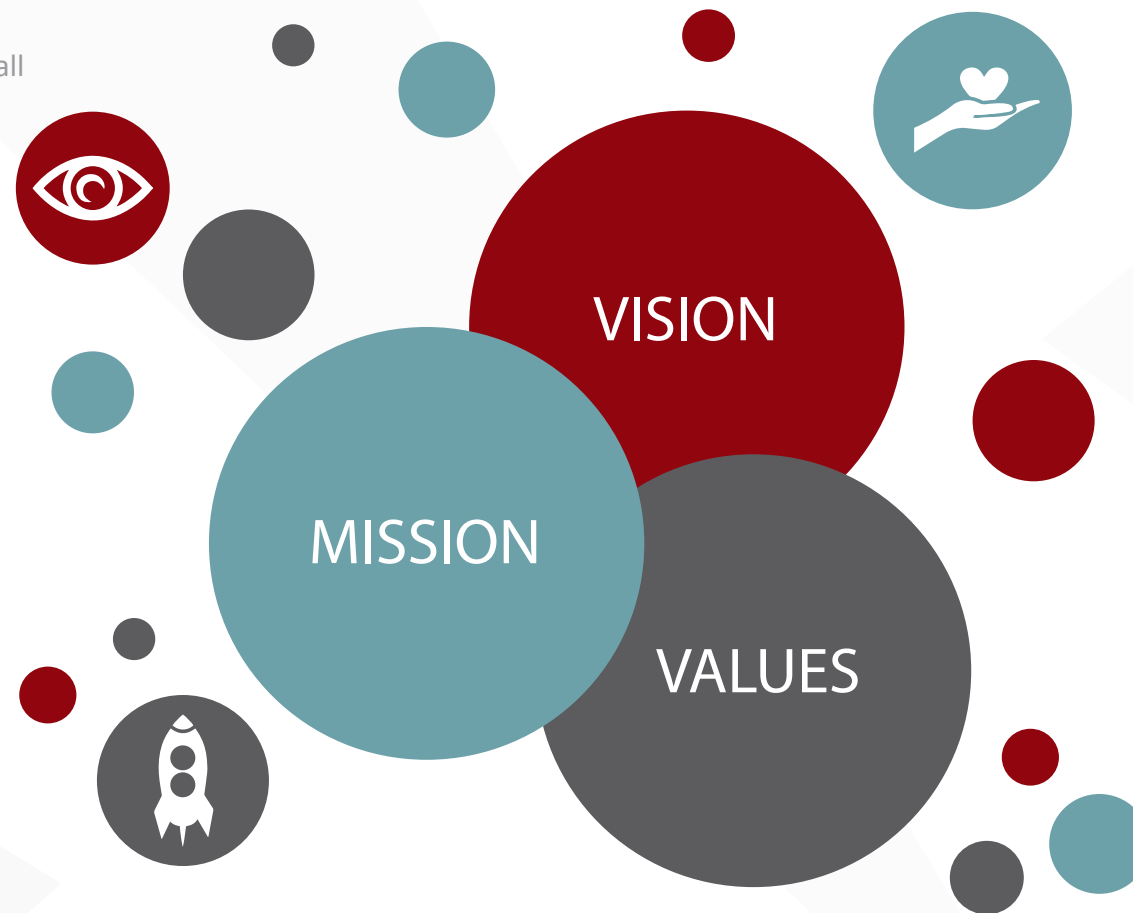
VISION

High quality healthcare for all children and families

VALUES

Respect
Supportive
Honesty
Inclusivity

Integrity
Collaborative
Innovative



MISSION

Promote and measure high quality interprofessional pediatric education by:
Ensuring optimal accessibility to this education tool;
Providing leadership and excellence in academic delivery and evaluation of simulation-based education;
Developing and mentoring high quality simulation educators;
Innovating and disseminating best practice;
Supporting quality and patient safety initiatives;
Conducting high quality simulation-based research

KIDSIM TEAM



Dr. Kerri Landry, Medical Director

Dr. Kerri Landry is originally from Montreal, Quebec where she attended McGill University and completed her MD/MBA, her Pediatrics' Residency and finally her Pediatric Emergency Medicine Fellowship. During her time at McGill, her interest in simulation education was sparked when they opened the Steinberg Centre for Simulation and Interactive Learning in 2006. She quickly fell in love with sim and became an active participant and educator in their emergency program. In 2009, she left the east, excited to join the Emergency Medicine Group at the Alberta Children's Hospital. Once in Alberta, Kerri became an active instructor with the KidSIM program, teaching at the undergraduate, resident, fellowship and staff levels as well as helping out with the Mobile Outreach Education program and various conferences and workshops. Delighted by the chance to take on a more formal role with the KidSIM program, in the spring of 2016, Kerri jumped at the chance to become an Assistant Medical Director overseeing the Mobile Outreach Education program. While she loved her role as the lead for Mobile Education, Kerri is now the Medical Director of the KidSIM Program. So far, she has worked with the team to navigate the Covid-19 pandemic and the program's Royal College Accreditation and is excited to explore how KidSIM can contribute its simulation expertise to help further the Quality Improvement work being done at the Alberta Children's Hospital.



Dr. Adam Cheng, Research and Development

Dr. Adam Cheng is a Professor with the Department of Pediatrics and Emergency Medicine at the University of Calgary. As a scientist and researcher at the Alberta Children's Hospital Research Institute, he oversees a program of simulation-based research focused on improving outcomes from cardiac arrest. Currently, he is leading the simulation research program (KidSIM-ASPIRE) at ACH and is also the Co-Director of the KidSIM Fellowship Program. Adam is internationally known for his work in simulation-based education and research. He has developed numerous simulation-based curricula, both at the local and national levels. His research in cardiac arrest, cardiopulmonary resuscitation and debriefing, includes a number of highly cited, simulation-based randomized controlled trials that have informed changes in international resuscitation courses. In 2018, he was lead author on the American Heart Association's Scientific Statement on Resuscitation Education that was published in the journal Circulation. He has edited several textbooks and is lead author of the Education Science of the 2020 American Heart Association Cardiopulmonary Resuscitation guidelines. Adam has been an active international leader. He is past-chair of the International Network for Simulation-based Pediatric Innovation, Research and Education (INSPIRE), which is the largest simulation research network in the world, comprised of over 250 pediatric hospitals and simulation programs.



Dr. Christine Kennedy, Assistant Medical Lead

Dr. Christine Kennedy is originally from Winnipeg and attended medical school at the University of Manitoba prior to moving to Calgary for her Pediatrics residency and Emergency Medicine fellowship. Throughout her fellowship she developed a passion for medical education and completed the Teaching Scholars in Medicine Certificate Program at the University of Calgary. She has been working as an Emergency Physician at the Alberta Children's Hospital since 2011 and has a very active role in teaching medical students, residents, and fellows. Christine took on a formal role with KidSIM in 2021 as an Assistant Medical Director and oversees the Mobile Outreach Education Program. She is excited to be involved in helping to develop and grow other educational programs within KidSIM.



Dr. Ashlea Wilmott, Assistant Medical Lead

Originally from Halifax, Nova Scotia, Dr. Ashlea Wilmott started her career in Nursing at the (then) brand new Alberta Children's Hospital in 2007. She subsequently attended medical school at McMaster University before migrating further west to complete the Royal College Emergency Medicine program at the University of Calgary. She works as an Attending Physician at the Alberta Children's Hospital and still enjoys seeing "big kids" at Cochrane Urgent Care. She has held positions in education and leadership within the provincial Connect Care project and RAAPID South. She and her husband, Shaun are the proud and tired parents of four busy children. Ashlea is very excited and humbled to be joining the incredible KidSIM Team in an Assistant Medical Director capacity focusing on Patient Safety and Quality Improvement.



Dr. Vincent Grant, KidSIM Fellowship Director

Dr. Vince Grant is the Co-Director of the KidSIM Fellowship Program and has been the Provincial Medical Director of the eSIM Program for Alberta Health Services since 2019. He is an Emergency Physician at ACH and a Professor of Pediatrics and Emergency Medicine at the Cumming School of Medicine at the University of Calgary. Vince was the Founding Medical Director for the KidSIM Program from 2005-2020, as well as the Founding Medical Director for the ATSSL at the University of Calgary. He has been an integral part of the growth of simulation-based education locally and has developed a national and international reputation for his work in this area. His main academic interests include simulation faculty development, debriefing and feedback methods, interprofessional simulation education, rural mobile outreach simulation, and innovation in medical education technologies.



Nicola Peiris, Team Lead

Nicola graduated with her BSc. from the University of Calgary. She has worked at the Alberta Children's Hospital since 2008 and joined the KidSIM-ASPIRE team in 2011. Nicola has managed numerous large research projects since 2009 and has worked with research teams within the PICU and the KidSIM-ASPIRE Program. From 2011 - 2020, she was the Network Manager for the International Network for Simulation-based Pediatric Innovation, Research and Education (INSPIRE), the largest pediatric simulation research network in the world. Nicola assumed the role of Team Lead for KidSIM in 2016 and works with the Medical Director, Research Director, and Patient Care Manager to oversee the day-to-day program and research operations of the KidSIM Program.



Helen Catena, Simulation Education Consultant

Helen graduated from Oxford UK with a pediatric nursing degree and after working in the UK for 2 years moved to work at The Hospital for Sick Children in Toronto. Two years later Helen relocated to the Alberta Children's Hospital in Calgary, working in the Intensive Care Unit since 2004. She became interested in simulation in 2006 when she started teaching in the KidSIM Program. Helen helped lead the development of the Undergraduate Interprofessional Education program as well as the Inpatient Hospital Pediatrics program. Helen formally joined the KidSIM Program part-time in 2011 as the KidSIM Simulation Education Consultant helping to coordinate all aspects of education that occurs in the program.



Amy Cripps, Simulation Education Consultant

Amy has a wide range of knowledge from her acute care experience in PICU and as a 2-person pediatric transport team as a RRT. This helps her be able to teach any level of learner from any discipline. She has been involved in simulation since 2008 and has been essential for the success of the Just-In-Time inpatient program that started in 2011 and continues to run bi-monthly. Amy has helped this unique delivery of simulation spread into other areas including PICU, NICU and Oncology/Hematology unit, making it a huge success. Amy assumed the role of Simulation Education Consultant in 2016. She works to organize and assist in all aspects of the program, particularly mentoring and faculty development.



Deborah Tamura, Simulation Education Consultant

Deborah's background is in pediatric nursing, calling ACH "Home" since the beginning for her nursing career. She has clinical experience in both inpatient and critical care as well as being part of ACH Nursing Education Team in various roles. She has been facilitating with the KidSIM program since 2016 and was thrilled to step into the position of Simulation Education Consultant in 2024. Deborah has participated in various KidSIM programs including the Undergraduate Interprofessional Education program, Mobile Education, PALS/PEARS courses, Family Centered Care Program and facilitating simulation in outpatient and community settings. She is excited to help co-ordinate the educational programming here at KidSIM but most inspired at the breadth of ways simulation contributes to excellence in pediatric care!



Louise Simonot, Simulation Education Consultant

Louise graduated from the College of Nursing at the University of Saskatchewan and moved into general pediatrics for a year before transitioning to the Cardiac PICU. She quickly moved to Calgary to continue her work in the PICU which took on many roles. She was involved in family centered care, transport and other committees which eventually lead to the Nurse Educator role in the PICU. Her love of teaching led her to the KidSIM Program in 2013, where her passion for teaching and family centered care has continued to grow. She is also involved in assisting and organizing aspects of the undergraduate program, mentoring and program development for family centered care.



Dr. Jeffrey Lin, Senior Analyst

Dr. Yiqun Lin (aka Jeffrey Lin) obtained his medical degree and completed his pediatrics residency training in China. While he was practicing at the Children's Hospital of Fudan University in Shanghai, he was granted a budget to establish a simulation lab within the Emergency Department, which represents the first pediatric simulation center equipped with high fidelity simulators in mainland China. He moved to Vancouver in 2011 and completed a master's degree on clinical epidemiology. In addition to a simulation research fellowship with the KidSIM Simulation Research Program at the Alberta Children's Hospital, Dr. Lin completed both his PhD and postdoctoral research project at the University of Calgary. His PhD project, examining the efficacy and cost-effectiveness of distributed practice and appropriate feedback on CPR quality, is critical to resuscitation education science. In 2022, Jeffrey accepted a new role as Senior Analyst, evaluating return on investment and cost-effectiveness for programs in the KidSIM Center.



Kerianne Craig, Simulation Aide

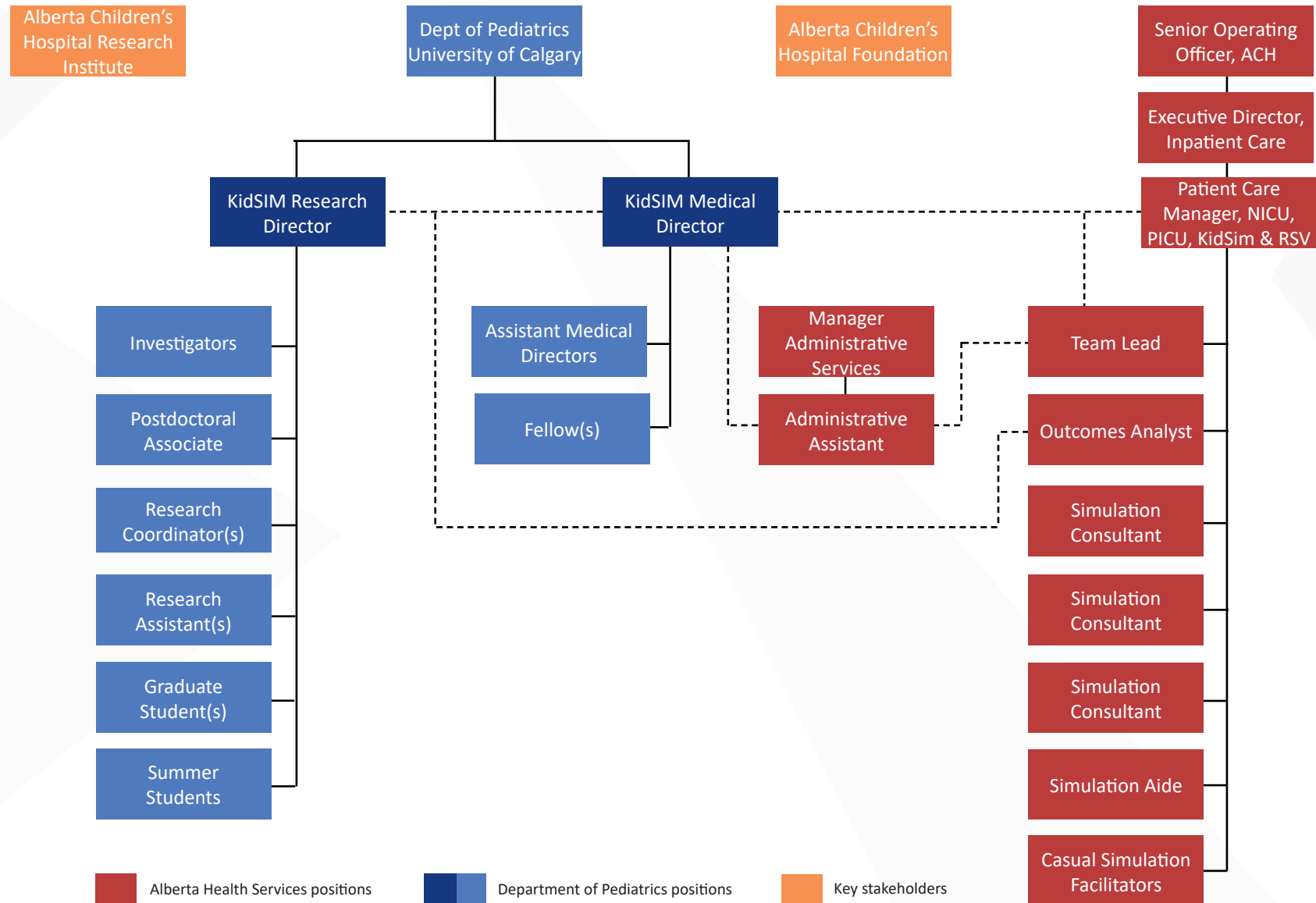
Kerianne has been at AHS Supply since 2003 and moved in 2009 to work in Supply management, specifically for Alberta Children's Hospital. Kerianne assumed the role of KidSIM Simulation Aide in 2016. Her previous experience has been essential in how she has been able to help ensure all the labs are constantly organized and restocked for both the facilitators and the learners. She has helped organize and tidy the center and provides technical support and equipment training. Kerianne is relied on by all of KidSIM. Kerianne's other interest is learning to run the wide range of mannequins used for all levels of sessions so that she can be more involved in the scenarios themselves.



Keely Piscopo, Administrative Assistant

Keely has a Medical Office Administration Diploma which she obtained from CDI College. Her career with AHS started in 2012 where she worked for the Regional Scheduling Offices. Keely came to the Alberta Children's Hospital in June of 2015 where she worked for the Department of Pediatrics, Section of Emergency Medicine as administrative support for three emergency physicians. Keely assumed the role of KidSIM Administrative Assistant in 2016. She has a wide array of experience with computer software, and technology troubleshooting. She brings with her talent, organizational experience, and in depth knowledge and she has been a real asset since joining the team.

GOVERNANCE



SIMULATION SUPPORT

KIDSIM TEAM

Kerri Landry
Nicola Peiris
Christine Kennedy
Helen Catena
Amy Cripps
Deborah Tamura
Louise Simonot
Jeffrey Lin
Kerianne Craig
Keely Piscopo

RESEARCH

Adam Cheng
Jennifer Davidson

MOBILE EDUCATION

Amy Cripps
Christine Kennedy

BIOMED SUPPORT

Dan Duperron

TRAUMA SERVICES

Karl Philips
Sherry MacGillivray

EMERGENCY MEDICINE

Andrea Boone
Antonia Stang
Brittany Sunderani
Caitlin Fernley
Cassidy Wyntjes
Christie Li Pi Shan
Connie Abrey
Cory Meeuwisse

Dana Stewart
Dana Stys
Deborah Tamura
Diane Hamel
Ellen Morrison
Fiona Stewart
Gavin Burgess
Gloria Yoo
Gord McNeil
Hussein Unwala
Jennifer Pearson
Jennifer Thull-Freedman
Joleen Lidberg
Julie Wallin
Kaitlyn Mousseau
Katelyn Maki
Kelly Millar
Keon Ma
Kida Stevens
Kristen Johnson
Laura Tak
Lindsay Burke
Lorraine Mabon
Lundy Day
Mary Tong
Megan Karmann
Melanie Willmann
Michael Pierse
Michel Schlegelmilch
Michelle Fric
Naminder Sandhu
Pamela Vandenbiggelaar
Paula Espinoza
Patricia Lee
Peggy Thomson-Gibson
Rami Ableman

Robyn Buna
Russell Lam
Sean Burke
Shabnam Minoosepehr
Shawn Dowling
Sherry Wilson
Shirmee Doshi
Tammy Nelson
TJ Kodeeswaran

PEDIATRIC TRANSPORT

Caitlin Brooke Moran
Chris Broderick
Eli Gilad
Jenna Camphaug
Kimberley Menzies
Neil Baribeau
Shannon Lindsay
Troy Carmichael

PICU

Andrea Jesney
Donovan Duncan
Eli Gilad
Jaime Blackwood
John Gilleland
Joy Handley
Laurie Lee
Meagan Mahoney
Rachel Brewer
Rob Catena
Tais Da Costa Sao Pedro
Tanya Drews

RESPIRATORY THERAPY

Alicia Tisnic

Andres Morin Mosquera
Chantel Jolivel
Hibah Hijair
Jeanine Johnson
Jennifer Oliverio
Leo Chen
Lindsay Gibbs
Lisa Liland-Macdonald
Michelle Vizard
Mikaila Nederveen
Salvatore Cimino
Welsey Li
William MacDougall

STEP

Kathryn Le-Williams
Keri Price
Leslie Ramos-Charlton

ECLS

Pat Yee
Steve Menzies

NICU

Amelie Strizke
Blair Becker
Claire Wattleworth
Jan Lind
Lori Stephen
Martin Perlsteyn
Norma Oliver

INPATIENT PEDIATRICS

Andrea Grottemeyer
Angie Arcuri
Chantel Jolivel

Chantelle Barnard
Chris Novak
Coty Ong
Danielle Maubert
Deanna Cook
Heather Breault
Jenna Wiseman
Jennifer Walker
Jennifer Shehata
Kirby Bell
Laura Davies
Lily Ragan
Lindsay Long
Marsha Bucsis
Maria Clowater
Maribeth Faustino Hill
Matthew Jansen
Megan Allison
Michael Friesen
Michelle Jackman
Preet Sandhu
Renee Jackson
Sharon Spicer
Suzette Cooke
Tobi Reisig

SURGERY

Corey Dowler
Laura Dunbar-Pubben
Shantel Cunningham
Steve Lopushinsky

OPERATING ROOM

Adam Spencer
David Lardner
Elisabeth Dobereiner

Jamin Mulvey
Jeremy Luntley
Mark Gale
Mary Brindle
Megan Hayter
Meggie Livingstone
Michael Letal

PACU

Karen Bibaud
Noemi Ly

HOME CARE

Amber Deus
Kayla Schaab
Lee Carson
Meredith Luipasco

ROTARY FLAMES HOUSE

Kathryn daSilva Curiel

CLINIC

Eileen Pyra
Nilufer Hasanova
Rebecca Perry
Wendy Schwarz

SPEECH

Beverly Collisson
Laura Sawers

CASUAL

Ashley Holloway
Wendy Bissett

FUNDING

The KidSIM Program is grateful to have received financial support for infrastructure, equipment and operations from various sources since 2004. The KidSIM Program is extremely proud of its long-standing relationship with the Alberta Children's Hospital Foundation, without whose support the pediatric simulation program would likely not exist.

ALBERTA CHILDREN'S HOSPITAL FOUNDATION (ACHF)

2004	\$262,898	Purchase of School-Aged Mannequin (METI) and AV equipment
2005	\$7,400	Purchase of Multimedia Equipment
2006	\$60,000	Purchase of Infant Mannequin (METI)
2007	\$203,740	Purchase of Portable Infant (Laerdal), School-Aged (METI) and Adolescent Mannequins (Laerdal)
2007	\$20,000	Physiological Monitor for Simulation Laboratory
2007	\$20,700	Funding for Simulation Facilitators
2008	\$76,000	Outreach equipment and portability solutions
2008	\$21,000	Funding for Simulation Facilitators
2008	\$2,394,500	Construction and Outfitting of the KidSIM Centre (2012-2013)
2009	\$150,000	Three year funding commitment for Simulation Facilitators (2010-2013)
2014	\$100,000	Funding for Simulation Facilitators
2015-2019	\$1,582,000	Funding for Infrastructure Support and Simulation Facilitators
2018-2019	\$181,000	Support for KidSIM Innovation: ACH 3D Printing Challenge
2019	\$93,685	Radiothon Support for purchase of new mannequins
2019	\$90,000	Radiothon Support for KidSIM Innovation: Virtual and Augmented Reality at ACH
2019-2022	\$1,350,000	Funding Extension for Infrastructure and Operations Support
2019-2020	\$51,784	Baby Sim Doll, Radiothon 2019
2019-2020	\$985	4 Little Junior CPR Trainers, Radiothon 2019
2019-2020	\$14,435	4 Resusci Juniors CPR Trainers, Radiothon 2019
2019-2020	\$490,000	Virtual & AR Technology, Radiothon 2019
2019-2020	\$26,480	Additional Funding, Radiothon 2019
2022-2027	\$3,457,368	Funding for Infrastructure Support and Simulation Facilitators
2023	\$11,300	CMAC blades, Radiothon 2023
2023	\$2,500	Rhythm Generators, Radiothon 2023
2023	\$1,200	AEDs, Radiothon 2023

FAMILY CENTERED CARE AND TECHNOLOGY PROGRAM (FUNDED BY ACHF)

2011	\$30,000	Purchase of Toddler-Aged Mannequin (Gaumard)
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PGME PROGRAM - DEPARTMENT OF PEDIATRICS

2010	\$30,000	Purchase of School-Aged Mannequin (Gaumard)
2010	\$30,000	Purchase of Toddler-Aged Mannequin (Gaumard)
2013	\$25,000	Purchase of School-Aged Mannequin (Laerdal)
2015	\$30,000	Purchase of Toddler-Aged Mannequin (Gaumard)
2021	\$26,200	Purchase of School-Aged Mannequin (Laerdal)
2023	\$3,161	AirSim Child Tracheostomy Trainer

DEPARTMENT OF PEDIATRICS

2005-present	0.2 FTE	Medical Director, KidSIM
2005-present	0.3 FTE	Program Coordinator/eSIM Consultant, KidSIM
2005-2013	\$129,372	KidSIM Operations Supplies, Minor Equipment, Warranties
2006-present		MD Facilitation Hours
2011-present	0.5 FTE	Research & Development Director, KidSIM-ASPIRE
2011-present	0.5 FTE	Administrative Assistant, KidSIM
2021	\$60,000	KidSIM Fellow

eSIM PROVINCIAL SIMULATION PROGRAM

2008-present	0.2 FTE	eSIM Consultant, KidSIM
2011-present	0.4 FTE	eSIM Consultant, KidSIM
2018-present	0.2 FTE	eSIM Consultant, KidSIM
2010	\$30,000	Infant Mannequin (Gaumard)
2012	\$30,000	Infant Mannequin (Gaumard)

OTHER PROGRAMS

2017	\$20,000	Purchase of Premie-Aged Mannequin (Gaumard) - NICU Program, Family Donor
2017	\$3,000	Purchase of Premature Anne Task Trainer (Laerdal) - NICU Program, Family Donor

THE KIDSIM CENTER CELEBRATES 10 YEARS

Through various fundraising endeavors and the generous support of the Alberta Children's Hospital Foundation, the \$2.4 million dollar 3,600 square foot KidSIM Simulation Center opened in January 2014. Since then, KidSIM has provided training and education space for 50,000 learners.

Located on the 4th floor of the Alberta Children's Hospital, the KidSIM Center accommodates 31 mannequins, 28 task trainers, four state of the art simulation suites each with individual control rooms, two proper debriefing rooms, a dedicated storage room, and space for program staff. Each of the teaching spaces is outfitted with an advanced multimedia system to be able to enhance the education experience and continue to offer the possibility of video recording for both research and quality assurance purposes.

The debriefing spaces are both Telehealth and Zoom capable to support rural partners, families, and virtual faculty development. Telehealth is used to regularly incorporate the transport team during mobile education sessions. This provides an added layer of realism and education to mobile education and is a launching pad for the transport program to widely implement the use of telehealth technology for all calls coming into the team.

With the ability to run concurrent simulations in multiple labs, the KidSIM Program has been able to provide more learning opportunities than ever before, especially for large interprofessional teams. The versatility of the space has allowed it to serve the diverse needs of both clinical and academic/research groups, including clinical education and training, faculty development, research, advocacy, family centered care and community outreach.



EDUCATION COMMITTEE

The purpose of the Pediatric Simulation Education Committee (PSEC) is to provide leadership, expertise and guidance in relation to the dissemination of pediatric simulation education, simulation curriculum, scenario design, evaluation, and simulation research. PSEC objectives include:

- To develop, review and disseminate peer-reviewed scenarios for use within the simulation program.
- To ensure excellence in the quality of program curricula and scenarios.
- To evaluate needs assessments from various user groups and design curriculum and scenarios to support these needs.
- Encourage and champion interprofessional education.
- Support the development of education models which integrate simulation technology.
- To review summative evaluations of user groups.
- To critically evaluate education provided by the KidSIM Program.
- To advise the Medical Director of the KidSIM Program as to resource needs from various user groups.
- Through the Medical Director of the KidSIM Program: To advise the Department Chair, Pediatrics; the Facility Medical Director and the Vice President of the Alberta Children's Hospital, the Child Health Advisory Committee, the Executive Director of eSIM, the Director of eSIM South, and the ACH Foundation about resource issues and needs in pediatric simulation.
- To provide a leadership role in experiential education related to pediatric patient simulation in Southern and Central Alberta, and Southeastern British Columbia.
- At the request of the Medical Director, KidSIM Program: To provide representation on related local, regional and provincial committees when required.
- To facilitate and support research projects incorporating pediatric human patient simulation.

Nicola Peiris (chair) - Team Lead, KidSIM
Dr. Kerri Landry - Medical Director, KidSIM
Dr. Adam Cheng - Research & Development Director, KidSIM-ASPIRE
Dr. Christine Kennedy - Assistant Medical Director, Mobile Education, KidSIM
Dr. Vincent Grant - Medical Director, eSIM Provincial Simulation Program
Helen Catena - Simulation Consultant, KidSIM
Amy Cripps - Simulation Consultant, KidSIM
Deborah Tamura - Simulation Consultant, KidSIM
Louise Simonot - Simulation Consultant, KidSIM
Kerianne Craig - Simulation Aide, KidSIM
Keely Piscopo, Administrative Assistant, KidSIM
Jeffrey Lin - ROI Outcomes Analyst, KidSIM
Marlene Franklin - Patient Care Manager, PICU/NICU/RSV Program/KidSIM

Jennifer Davidson - Research Coordinator, KidSIM-ASPIRE
KidSIM Fellow(s)
Sherry MacGillivray - ACH Trauma Program
Andrea Jesney - Pediatric Intensive Care Unit
Dr. Eli Gilad - ACH Transport Program
Dr. Mark Gale / Dr. Michael Letal - Department of Anesthesia
Dr. Suzette Cooke - Section of Hospital Pediatrics
Corey Dowler - Clinical Nurse Specialist, Surgical/Ambulatory Services
Karen Bibaud - Clinical Nurse educator, PACU
Tara Bourque - Unit Manager, Operating Room & PACU
Connie Abrey - Clinical Nurse Educator, Emergency Department
Dr. Sharron Spicer - Child Health Safety Committee

PROGRAMS



KidSIM is responsible for the training of up to 6, 000 learners per year. These learners come from all levels of training, from undergraduate learners all the way through to practicing health professionals, and also includes the parents and family supports who care for children at home or in schools. The breadth of the education programs offered by KidSIM demonstrate our commitment to providing accessible, comprehensive, integrated, and coordinated health education delivery to both healthcare providers and families.

Our objective of delivering simulation-based education to all individuals and interprofessional teams across the ACH and our focus on expanding this education to families aligns our work with the ACH vision of providing excellence in family-centered care. Our track record also demonstrates alignment with the strategic directions of AHS, in that we are bringing health care education to the communities that serve their local populations, striving for a safer and more efficient care system, and increasingly showing that we are working towards better health outcomes.

KidSIM Program Outcomes:

- Improved performance of skills of ACH staff and emergency staff in hospitals across the catchment area.
- Improved adherence to established clinical guidelines and protocols of ACH staff and emergency staff in hospitals across the catchment area.
- Improved teamwork and collaboration of ACH staff and emergency staff in hospitals across the catchment area.
- Improved performance of skills of family/caregivers providing in-home care to children with acute illness.
- Improved patient safety and quality of care through uncovering and addressing patient safety threats.
- Conduct innovative, high-quality, simulation-based research to inform healthcare providers, administrators and families of best practices, which will optimize pediatric patient outcomes from illness.

PEDIATRIC EMERGENCY MEDICINE

Emergency Department inSITU Simulation **NEW!**

This pilot program ran from June 2023-May 2024. Cases were selected based on high acuity, low occurrence presentations that present to the ACH ED. The participants encompassed members of the trauma team on shift (RNs, RRTs, LPNs) and an Emergency physician came in early prior to the start of their shift. The cases and debriefs were short (20 minutes total time) and focused on patient care themes that the leadership team had reviewed, as well new protocols and medications. System and safety issues that were identified were discussed by ED leadership at site-operation meetings. Over the pilot year, they had 117 learner participants. This program was well supported by the ED management team and will continue next year. This program improved staff confidence with new processes, improved staff engagement, identification and mitigation of potential safety issues

QI project: Emergency Department Procedure Room Simulation **NEW!**

In collaboration with the Emergency Department leadership team and a representative from the human factors team, a simulation was organized in the Emergency Department procedure room. The goal was to evaluate the feasibility of responding to an unexpected complication during procedural sedation and the case was based on an actual clinical event. The participants in the simulated case were front line workers who work in this department. The team then debriefed with all participants and leadership representatives to brainstormed potential solutions. A summary report was sent to the emergency department management team. This project identified and mitigated latent safety threats, improved staff confidence and engagement, and improved patient safety.

Undergraduate Interprofessional Education

The Undergraduate Interprofessional Education Program is one of the first of its kind in the entire world. This program allows undergraduate learners from different health professions in their final year of training to work together to manage common pediatric illnesses and injury. These sessions include nursing students from the University of Calgary and Mount Royal University, respiratory therapy (RT) students from SAIT, licensed practical nurse (LPN)

students from Bow Valley College, Emergency Medical Services (EMS from SAIT), pharmacy students from University of Alberta and medical students from the University of Calgary during their clerkship rotation in Pediatric Emergency Medicine. These sessions focus primarily on teamwork skills such as communication, roles and leadership while also learning to manage common pediatric acute care presentations (such as shock, respiratory distress, seizures and anaphylaxis). This program runs weekly year-round.

Pediatric Emergency Medicine Junior Resident Simulation Education

This program runs monthly and is aimed at junior residents (PGY1-2) during their Pediatric Emergency Medicine rotation. These residents come from various postgraduate programs and this program is intended to teach them various aspects of the care of common pediatric acute care scenarios, including respiratory distress, shock, seizures, anaphylaxis and trauma care.

Pediatric Emergency Medicine Senior Resident / Fellow Interprofessional Team Training

The Emergency Medicine interprofessional team training program links senior residents (typically PGY3 and above) who are performing their rotation in Pediatric Emergency Medicine, as well as Pediatric Emergency Medicine Fellows (as part of their academic half-day schedule) with experienced emergency department nurses from the Alberta Children's Hospital. This session runs monthly and incorporates cases related to complex emergency department patients. The program focuses on allowing senior residents and pediatric emergency medicine fellows the opportunity to lead resuscitation teams from the pediatric emergency department. Team training is a compulsory part of the education curriculum for emergency room nurses, and they must attend one session per year. The curriculum focuses on teamwork skills and management of complex pediatric acute care patients.

Managing Pediatric Emergencies for Adult Emergency Department Nurses

This program provides valuable experience and teaches basic management of pediatric emergencies to adult emergency department nurses during their orientation period. The learners are new nurses from all Calgary Emergency Departments and Urgent Care Centers. Objectives of this program are based on management and identification of common pediatric emergency presentations.

Pediatric Emergency Medicine Fellowship Simulation Education

The curriculum for pediatric emergency medicine fellowship training was developed with help from leaders the Alberta Children's Hospital. The new national curriculum adopted by the Royal College of Physicians and Surgeons of Canada has 16 required subjects embedded into it over the 2 years, to create a total of 24 scenarios. This fellowship training not only focuses on the medical management of the patient in these scenarios but also developing and improving teamwork and communication skills by ensuring that they are all interprofessional. Nursing and Respiratory Therapists from the emergency department are a vital component in these monthly sessions.

Pediatric Emergency Medicine Attending Physician Interprofessional Simulation Education

Recognizing the importance of team training and continuing competence, the emergency department has implemented monthly simulation sessions



involving attending physicians, staff nurses and respiratory therapists. Whenever possible, the training occurs in the Trauma room of the Alberta Children's Hospital Emergency Department to enhance the realism of the scenario and evaluate current systems. These sessions focus primarily on the management of acutely ill pediatric patients.

Pediatric Trauma Services Simulation Program

This Pediatric Trauma Program provides simulation opportunities to any healthcare providers that work with trauma patients to teach both teamwork and medical management. These Trauma simulation sessions help to look at issues, guide revisions to the system and educational needs. Learners come from a variety of clinical backgrounds that include: the pre-hospital environment for Emergency Medical Services, the Emergency Department, Diagnostic Imaging, Transfusion Medicine, the Intensive Care Unit, the Operating Room, and the inpatient Trauma Unit (Unit 4). Involving multiple services across the trauma care continuum enables better communication and care management necessary to effectively treat multiple injured pediatric patients; doing this with simulation is felt to be the best, most realistic technique.

The Pediatric Trauma Program also collaborates with KidSIM in the Mobile Education Program. As a Level 1 Pediatric Trauma Centre, the Trauma Program is mandated to provide education for the ACH referral centers. Scenarios are developed on needs assessment from those centers, as well as real cases that were identified as being challenging. The interprofessional teams take part in the scenario in their own resuscitation/trauma room which helps to identify equipment, resources, logistical and educational needs. This proves to be invaluable for the referral centers in multiple ways. Of note, the Accreditation Canada survey September 2019 for Provincial Trauma Distinction highlighted this robust outreach program as a clear demonstration of commitment to provide quality trauma care to the pediatric population of Southern Alberta. e is always a hospital pediatrician and intensivist as part of the team facilitating the mock. Following each mock code there is a summary document circulated with learning points from the event (system, communication / teamwork skills, etc.)



PEDIATRIC INTENSIVE CARE UNIT (PICU)

Mock Code Program

This long-standing program provides code blue (resuscitation) teams and the corresponding 'host' staff where the mock code blue occurs to practice resuscitation skills monthly. Various areas around the hospital are selected to 'host' mock code training. Scenarios are built specifically for the 'host' area and involve a deterioration of a patient that would typically be seen in that clinical area. The scenarios are geared to the interprofessional on-call resuscitation team. However, staff from the 'host' unit is also included in the simulation. There is also a significant focus on process related components within the mock code to identify gaps or issues around those aspects of calling a code blue. This program involves the real team that would be running the code. To maintain a safe learning and debriefing environment, there is always a hospital pediatrician and intensivist as part of the team facilitating the mock. Following each mock code the team discusses learning points from the event (system, communication, teamwork, etc.)

Extracorporeal Life Support (ECLS) Team Training

ECLS is a type of major life saving therapy that requires connecting an Extra Corporeal Membrane Oxygenation (ECMO) machine, to directly assist the heart and/or lungs outside of the patient's body. This therapy is considered when maximized conventional intensive care therapies including CPR, is insufficient for patient support and recovery.

To provide this treatment, Dr. Jaime Blackwood developed a program in October 2011 that requires effective communication, coordination, and high-performance simulation training of interprofessional and interdisciplinary teams to initiate ECLS in critically ill patients. The team is composed of Pediatric Intensive Care Registered Nurses, Respiratory therapists, Physician Intensivists, General Surgeons, Cardiologists, and Perfusionists, that are committed to fulfill their role responsibilities, being well-practiced, and ultimately, team success. To simulate a real event, the team uses cannulation mannequins in both infant and pediatric sizes and a specialized ECLS simulator. They practice various scenarios of the entire ECLS procedure that include appropriate CPR delivery; preparation of the ECLS machine and surgical equipment; surgical cannulation of neck vessels during CPR and non-CPR events; securing circuit attachment to cannulas; providing appropriate prescriptive circulation on ECMO; as well as troubleshooting and managing any other potential complications or events.

The ECLS program at ACH is rare and unique worldwide for initiating ECLS at a non-cardiac center that covers all inpatient areas, the NICU, and the emergency department. As of February 2024, the ECLS program has cared for a total of 79 neonatal and pediatric patients. Survival to hospital discharge for patients is 63%, as compared to the ELSO Registry International average which sits between 55-64%. Program success can be largely attributed to simulation as the core of the educational curriculum as well as an intensive review process and quality improvement activities.

PICU Nursing Orientation

Nurses hired for the PICU are provided an orientation which prepares them to work in this challenging environment. KidSIM offers a space for educators to engage these staff in simulation-based skill development opportunities which augments the didactic content.

Pediatric Intensive Care Unit (PICU) Just-In-Time Training

The education team in the PICU has established regular interprofessional sessions based on real patients. The benefit is that the worst-case scenario of a deterioration of a patient is practiced in a safe environment so that the team knows what to do and how to manage the change in condition.

PICU Interprofessional Team Training

This program focuses on critical care medicine and team training in the Intensive Care Unit. The participants are PICU Nurses, Respiratory Therapists and Attending PICU physicians. The objectives focus primarily on teamwork skills and medical management of the most critically ill and complex children cared for in the PICU. They have used simulation to change systems and introduce new equipment to staff ensuring that they are well trained and prepared for any situation.

PICU Continuous Renal Replacement Therapy (CRRT) and Therapeutic Plasma Exchange (TPE) Programs

The PICU based CRRT program was initiated in the fall of 2016 and the team consists of PICU physicians and RN specialists. This team of 30 Specialists receives initial training sessions of 2-3 days, and then annual re-certifications of 4 hours. All these sessions incorporate simulation approaches to create optimal learning for the participants and help the educators evaluate education processes. A big challenge for the team has been maintaining skills for these low volume/high acuity therapies and we have found simulation helps the team feel confident providing excellent care for critically ill pediatric patients.

STEP Team Training

The STEP team is a pediatric critical care response team who provides early assessment, education and management of evolving unstable pediatric patients admitted to inpatient units, outpatient clinics, as well as transition care for patients being transferred out of the PICU/NICU to the inpatient units. The STEP team is involved in a number of interprofessional simulation sessions and use the venue to provide education to healthcare teams on the role of the STEP team, as well as patient management of acutely ill children. The team uses simulation to orientate new team members, maintain skills

and practice management of the deteriorating pediatric patient. The team is involved in many different educational courses that simulate the need for the healthcare team to activate the STEP team. If the STEP team is available and not busy with a real patient they will respond to this call and take part as a participant in the simulation.

Pediatric Transport Program

The Pediatric Critical Care Transport Team (PCCTT) is responsible for the safe transfer of critically ill children from across southern Alberta and southeastern British Columbia to the Alberta Children's Hospital for escalating care, and to transfer patients to the Stollery Children's Hospital (Edmonton) for cardiac surgical services. This team currently has 38 RN's and RT's.

In 2023 the Transport team began training 6 RN's and 3 RRT's. At the present 30 members of the PCCTT are certified to fly transport patients without physician accompaniment (RN/RT team only). In 2023, 246 children were transported by the transport team, and 83% of pediatric transports performed used a two-person (nurse and respiratory therapist) transport team, and a medical control physician consulting via phone. Simulation is a key component to the educational curriculum, including a formalized simulation program that runs the team through weekly sessions. Simulation is used for initial training, skill maintenance, process improvement, and equipment familiarizations. The transport team partners with EMS, STARS and Air Ambulance to run simulation sessions incorporating their team members and to utilize their vehicle simulators to run scenarios in the real environment. The program utilizes a simulation exam as a part of the certification process for RNs and RTs. The transport team has partnered with the mobile education program over the last number of years to have a transport team member trained as a facilitator to participate on every mobile outreach session.

The past 8 years have seen the transport team regularly incorporate telehealth during mobile education sessions. This provides an added layer of realism and education to mobile education and is a launching pad for the transport program to widely implement the use of telehealth technology for all calls coming in to the team. Simulation provides the opportunity to be one of the most well-trained pediatric transport teams in the country.

NEONATAL INTENSIVE CARE UNIT (NICU)

SANTS (Southern Alberta Neonatal Transport) Outreach **NEW!**

The SANTS transport team working out of Foothills Medical Center has organized several outreach teaching sessions for centers across rural southern Alberta. These sessions provide frontline staff with high fidelity simulation scenarios in order for them to practice their neonatal resuscitation skills. This program is taught primarily by KidSIM ASSET alumni.

Neonatal Resuscitation Program (NRP)

The ACH NICU Education team has incorporated simulation in the Neonatal Resuscitation Program. This is a required course for all nurses, respiratory therapists and physicians. They run monthly courses to ensure all the staff are kept up to date and maintain their skills. This course has been very successful; simulation has added to the realism for the learners.

NICU Interprofessional team training

The NICU educational team has worked hard providing regular in situ simulation sessions for the entire medical team working that day. They have created common scenarios that they would see and have managed to engage the staff in taking part in simulation. They are also focusing on medical management, teamwork and communication as well as systems. Simulation has helped them adapt the unit to fit their needs better with simple changes helping the staff become more efficient.

Neonatal Intensive Care Unit (NICU) Just-In-Time Training

The NICU has established a Just-In-Time simulation on real patients that are admitted in the unit. This provides the entire team, novice to expert the skills and knowledge to predict and anticipate potential deterioration of that patient with the hope that the change in condition is able to be prevented.

NICU Proskills Pediatric Resident Training

The NICU Proskills team has provided pediatric residents the opportunity to learn and practice NRP via high fidelity simulation at KidSIM. They also provide residents the chance to learn more focused hands on skills that relate to caring for the most critically ill newborns of southern Alberta.



PICU/NICU/ED

Difficult Airway Activation

When a difficult airway is encountered or suspected in a patient anywhere in the Alberta Children's Hospital, a specialized team equipped with advanced pediatric airway skills urgently attends the situation. The KidSIM Program has supported the implementation of the Difficult Airway Activation plan, supporting multi-disciplinary teams from Emergency, PICU, NICU and Inpatient Units to work together in stressful and urgent situations to improve patient safety and quality of care. Through careful planning, teams develop sustainability plans and KidSIM shares learnings from these events throughout the hospital.

OPERATING ROOMS/DAY SURGERY/POST-ANESTHETIC CARE UNITS

Anesthesia Assistant AHS Course **NEW!**

Alberta Health Services (AHS) has identified anesthesia workforce supply shortages across Alberta. With the surgical recovery from COVID-19 and the implementation of the Alberta Surgical Initiative (ASI), the annual volume of surgical procedures is increasing. However, the current anesthesia workforce will not be able to absorb this increase. AHS has committed to sustaining and increasing anesthesia services across Alberta using multiple iterations of the Anesthesia Care Team Model. As part of this commitment, AHS has initiated a 24-week training course for Anesthesia Assistants. Embedded within this program is simulation training. KidSIM is involved in a 1-day training session at ACH, which includes a half-day dedicated to simulation exercises.

Short Stay Surgical Unit (SSSU)

This program runs monthly simulation sessions capitalizing on previous set education time, currently 30 minutes on Friday mornings. These sessions are uni-professional focusing on nursing staff of the Short Stay Surgical Unit and occasionally the Nursing Support Team. The objectives focus on managing a variety of routine post-surgical complications, emergency scenarios, addressing past complex cases or safety concerns, expansion of patient population and safest together initiatives. Simulation is also incorporated into new hire orientation and annual education days.

Pediatric Anesthesia Core Sessions

This is a 9-week program offered every two years at ACH. Over 9 Thursday afternoons, all U of C anesthesia residents (from R1-R4) participate in a four-hour session with didactic lectures covering a broad range of pediatric anesthesia subjects. Prior to the lectures this program facilitates simulations which are germane to the proceeding lectures for that particular session.

Post-Anesthetic Care Unit (PACU)

Simulation education is built right into existing education time for PACU staff which is currently 30 minutes on Friday mornings, of which simulation sessions are approximately 4-6 times per year for nursing staff. The team is trying to include Anesthesia into the sessions when they are available. Most

of the sessions to date have focused on emergency events that may happen in PACU, such as airway management. PACU also includes simulation in annual continuing education skills day, which every staff member must complete. The KidSim Lab is also used for new hires to teach PACU specific scenarios.

MEPA (Managing Emergencies in Pediatric Anesthesia)

This is an all-day simulation course focusing on 4 Pediatric Anesthesia Crises. Every resident in the U of C Anesthesia Program has been taught through this internationally recognized program that is offered every 6 months. MEPA is a well-established course in the UK which was brought to the ACH to improve comfort and competence in Pediatric anesthesia management for trainees.

Perioperative Crisis Management Course (POCM)

POCM is a full one-day course at ACH designed and developed to improve crisis management in operating rooms. POCM is a multidisciplinary, inter-professional course involving operating room RNs, post-operative recovery room RNs, Pediatric Anesthesiologists, Pediatric Surgeons, and Respiratory Therapists. This 6-hour course involves 3-4 simulated crises scenarios based on real scenarios that have happened in the peri-operative environment. Cases which have been reviewed at Quality Improvement/Quality Assurance rounds are used as a foundation for scenario development, uniting QI/QA initiative with a simulation initiative with a goal to optimize patient care. POCM participants receive extensive feedback on their performance.

In addition to self-assessment, participants engage in prolonged debriefings where team assessment is the focus. Both individual and team performance are highlighted within each debrief and all members of the team are involved in each scenario and debrief. The objectives include the recognition of the importance of a multidisciplinary team and the impact of human factors on the delivery of safe and effective care during a perioperative crisis.



NEURO CRITICAL CARE

Neurocritical Resident Simulations

The aim of this program is to provide neurocritical care residents with exposure to patient conditions that are not frequently encountered and to equip them with the necessary skills and knowledge to manage such situations. KidSIM played a pivotal role in the program by providing a simulated environment, facilitating the sessions, and collaborating in the development of scenarios. The program has proven to be a success, with neurocritical residents becoming more engaged and confident in their ability to manage these patients. The collaboration between KidSIM and the neurocritical fellows has facilitated the creation of an effective training program that has demonstrated its value in enhancing the skills and confidence of neurocritical residents.

ALLIED HEALTH

Allied Health Team

Simulated learning experiences provide invaluable opportunities for allied health teams to refine their skills, especially when it comes to handling critical scenarios like acute setting suctioning and caring for fragile neonatal intensive care unit (NICU) babies. Speech Language therapist, Physiotherapist and occupational therapists joined interprofessional sessions to learn together from each other.

PALLIATIVE CARE

Rotary Flames House

Rotary Flames House has grown to care for patients with greater medical needs, such as ventilated tracheotomy patients. They have incorporated interprofessional in situ simulation for the staff to become more familiar with the specialized needs of their patients. They have also adopted the 'Just-In-Time' philosophy and run scenarios based on the care needed for their patients that are presently admitted in the Rotary Flames House.

MENTAL HEALTH

Reintegration and Return to Wellness **NEW!**

The goal of this program is to create a psychologically safe simulation initiative, grounded in trauma and motivation theory, to enhance work reintegration and peer-support for in-hospital health care providers who are dealing with operational stress injuries. This innovative idea builds on current clinical simulation and peer practices and moves beyond simply education and emergency preparedness, to utilizing simulation for wellness, rehabilitation, and emotional preparedness. Simulation experts work closely with treatment teams (Psychologist, OT) to advise on how simulation can be individualized and used to support return to wellness.

EMS Reintegration

Post-traumatic injury can have a significant impact on EMS staff, both physically and emotionally. For EMS personnel, returning to work after an injury can be a challenging experience, particularly if they have lost confidence in their ability to perform their duties effectively. Simulation can be an effective tool to help EMS staff re-integrate into their roles after an injury. By creating realistic scenarios that reflect the challenges and demands of the EMS environment, simulation can provide a safe and controlled environment for staff to refresh their knowledge and skills, gain new insights and rebuild their confidence. In addition to clinical skills, simulation can also help EMS staff prepare for the emotional and psychological challenges of returning to work after an injury. Simulations can be designed to reflect the unique emotional and psychological demands of the EMS environment, such as managing stress, dealing with critical incidents, and communicating effectively with colleagues and patients.

The use of simulation is a valuable tool for EMS staff re-integration after an injury. By providing a safe and controlled environment for staff to practice their skills and build self-assurance, simulation can help EMS personnel return to work with the confidence and resilience needed to provide high-quality care to their patients.

CHILD LIFE

Child Life Emergency Department Support

The collaboration between KidSIM and Child life specialists aims to enhance the competency and confidence of staff in the high acuity and fast-paced emergency room environment. As the demand on the emergency department increased, there was also a growing need for Child Life staff to support children and families. To achieve their objective, Child life staff incorporated simulation into their training for both new and experienced staff, focusing on scenarios that they would typically encounter while assisting children in the Emergency Department. The simulations aimed to teach staff how to effectively prepare children and families for various procedures such as stitches, sedations, IVs, and blood tests. They also trained staff on how to distract children while anticipating the next steps in the procedure and where to stand to provide the best possible support. The simulation allowed staff to share their experiences and insights, thereby increasing the capacity for Child Life and enriching the overall experience for all involved. All Child Life staff had the opportunity to take part in the simulation, enabling them to practice in a simulated environment without any adverse outcomes for the child and family. This training approach provided a safe space for staff to learn and develop the necessary skills to assist children and families in the emergency room effectively.



SYSTEMS SIMULATIONS

Ebola Preparedness

In light of the global concern surrounding the Ebola virus, it became necessary to provide Personal Protection Equipment (PPE) training for staff in high-risk areas within ACH. KidSIM, in collaboration with the Environmental Protection department, played a key role in delivering this training. The training sessions involved several insitu simulations using real PPE, providing staff with hands-on experience in the process of donning and doffing equipment, as well as safety precautions to be taken when working in high-risk areas. Through this training, the staff were able to identify a core group responsible for PPE management, understand the available resources, and implement safety protocols through the use of a buddy system. As a result of the PPE training program, staff members are better equipped to manage the risks associated with working in high-risk areas. The success of this program highlights the importance of collaboration in developing effective solutions to address global health concerns such as the Ebola virus. By leveraging the expertise and resources, KidSIM was able to provide staff with the knowledge and skills necessary to operate safely in high-risk areas and effectively manage the risks associated with the Ebola virus.

Evacuation Simulations

In preparing for the unknown, simulation can play a valuable role in systems simulations which allow the team to practice potential real events. In 2018, the Alberta Children's Hospital, along with KidSIM, practiced evacuation simulations with several different pieces of equipment. Staff involved safety, simulated within the hospital, what it might be like to have to evacuate patients. Going down different staircases, over different types of flooring and with multiple sizes of patients. By preparing for evacuation events, it can allow for all disciplines within the hospital to be equipped and supported if a real event were to occur.

Systems Simulations

Simulation is being used on a regular basis to test systems/environments in most areas within the hospital. This has included simulating moving sick children from one area to another (ER to OR, inpatient unit to PICU during

CPR), to work out new processes and discover some unforeseen challenges in caring for the child in this situation. The simulation helps identify high risk processes that are often unpredicted and also allows staff to experience these scenarios prior to them occurring. Simulation has also been utilized to practice new or changes in processes or test new areas of patient care prior to an adverse event occurring.

Emergency Management Disaster Preparedness

Simulation is the foundation of testing emergency management disasters to prepare staff for an unpredicted event. This has included code purple (hostage or threatening situation) and Ebola exposure allowing staff to safely practice an event occurring within the hospital. The staff involved are fully supported during and after the event with a special focus on maintaining psychological wellness while practice distressing events. Systems issues or gaps in education can be identified and a solution created prior to real event.



INPATIENT PEDIATRIC UNITS

Resident Indigenous Communication Simulation **NEW!**

This Indigenous themed simulation is a collaborative effort between eSIM, KidSIM and the Indigenous Health Program. These sessions serve as platforms for meaningful conversation and sharing, enriched by the involvement of Indigenous Advisors and Hospital Liaisons who act as experts and actors at each session. Traditional practices such as smudging, prayer, and talking circles are also incorporated. Through simulation, the aim is to advance the integration of cultural competence knowledge, encompassing attitudes towards personal bias, communication strategies, and awareness of organizational resources into the practice of healthcare providers. The experiences of learners thus far overwhelmingly underscore the value of this education and highlight the ongoing need for experiential learning to foster culturally competent care. The participation of pediatric residents at KidSIM further enriches these endeavors.

Pediatric Interdisciplinary In-patient Simulation Education

The section of Hospital Pediatrics has been running interprofessional training sessions with in-patient unit nurses and respiratory therapists since 2007. This is a truly novel program that includes the attending staff hospital pediatricians. These bi-monthly sessions incorporate specific cases related to the inpatient unit where the participating staff normally works. The sessions are designed to highlight both medical objectives and teamwork skills. The section of Hospital Pediatrics has made this a mandatory education session for all Pediatric Attending Hospital Pediatricians working at the Alberta Children's Hospital. Simulation sessions have incorporated other departments to highlight new policies and processes, including PICU and the ECMO team, anesthesia, sub-specialty medical and surgical services, and Child Life, to make these simulations truly relevant to current in-patient practice.

Pediatric Residents' Academic Half-Day Interprofessional Simulation Team Training with In-patient Nurses

On a yearly basis, each post-graduate year (PGY) level of resident is offered two complete afternoons dedicated to simulation team training with in-patient nurses (total 8 times per year). During these sessions, the pediatric

residents are paired up with nurses from the various in-patient units and work through pediatrics scenarios. The cases are run with respect to the unit from which the nurses come, so that these are the types of patients they would be likely to see on their unit. For example, the PGY2 residents might run a scenario of shock, which would be modified to fit an oncology patient if the nurses are from Unit 1. The residents are given the opportunity to act both as team leaders and team members during each of the scenarios. These sessions focus on teamwork skills, as well as medical management.

General Nursing Orientation Programs

Clinical Nursing Educators (CNEs) from across the hospital created a general nursing orientation for every RN and LPN that starts at the Alberta Children's hospital. This is an intense 2 week course allowing the new staff to obtain all the information they need to in a short time. The program has incorporated Pediatric Emergency Assessment, Recognition, and Stabilization course (PEARS, Heart & Stroke Foundation) along with simulation to consolidate the knowledge that they obtain from the lectures. The feedback has been very positive in both how much they enjoy the simulation and how much they learned during it. Following this positive introduction to KidSIM and simulation the hope is that they will become more comfortable in taking part in simulation as their career develops at ACH.

The "First Five Minutes" Program

The "First Five Minutes" program is a training initiative that targets in-patient teams, consisting of nurses, respiratory therapists, occupational therapists, physiotherapists, and other members involved in providing care on a given unit. The program employs simulation scenarios that simulate serious events and challenges the team and how to respond appropriately. During the simulation, the team identifies how to call for help and which team is required, the roles that are necessary and how to assign them, and how to manage the patient using available resources on the unit while waiting for the advanced team to arrive. The intended audience for this training is the healthcare teams that are currently providing or will potentially provide care on the unit. By participating in these sessions, the team becomes more knowledgeable about the resources available to them, how to call for help, and the roles required while waiting for advanced assistance to arrive.

CAR-T

Unit 1 started a transplant process in the unit called CAR-T. The side effects of this treatment can be life threatening, and a significant number of patients need PICU admission to support them through these side effects which is similar to sepsis and assessing for neurologic toxicity. The Oncology unit and PICU healthcare workers collaborate with many different groups to understand the process and be aware of the side effects and the process of managing the symptoms for Oncology teams and PICU teams. Training includes theory information followed by simulation to provide the opportunity to practice this management and experience all the potential deterioration to help them prepare. This also includes targeted simulation for each unit, with the scenarios being just for each unit.

Nursing Education Programs

Clinical Nursing Educators (CNEs) from across the hospital regularly build simulation into a variety of their educational programs. This includes everything from orientation of new staff to mandatory annual education to targeted education days. New policies and procedures are introduced using simulation as a teaching tool. Scenarios are built to be unit specific and focus on teamwork and patient management. Simulation is used to help staff amiliarize themselves with new equipment and create a safe environment for trouble shooting issues that may have arisen.

Heated Humidified High Flow Nasal Canula (HHHFNC)

During the winter, the need for Heated Humidified High Flow Nasal Canula Oxygen (HHHFNC) for pediatric patients on inpatient units was accentuated due to the increased acuity and patient population. To address this issue, KidSIM collaborates with the Nursing Education team to provide insitu education on equipment and the use of HHHFNC as per the policy developed by Alberta Health Services (AHS). A mobile teaching team is deployed to circulate throughout the hospital and provide visual and hands-on education on the equipment, provide information, and help troubleshoot any questions or concerns. The outcome of this initiative is that the team felt more competent in using HHHFNC, more patients received therapy on the inpatient units, and there was greater fluidity in communication and collaboration between the Pediatric Intensive Care Unit (PICU) and Pediatrician teams in providing optimal care to the patient.

OUTPATIENT SIMULATION PROGRAM

Outpatient Simulation Program

KidSIM routinely offers training to specific outpatient clinical areas. The learners practice skills as a first-responder and come from a variety of backgrounds such as infectious diseases, cardiology (including ECG technicians), dentistry and diagnostic imaging, among others. Scenarios and objectives are specific to the clinical area and are based on rare and uncommon patient adverse events. These sessions often include the STEP team or Mock Code program.



FAMILY CENTERED CARE

School Bus Driver Simulations **NEW!**

4Seasons Transportation Services are a team of Transfer Care Specialists who are uniquely trained to transport students with disabilities to school in a caring and safe way. Through Homecare's collaboration with clients both at home and in schools, a safety gap was identified. Medically fragile students spend considerable time traveling on school buses, with some spending up to three hours a day. The staff at 4Seasons Transportation requested support in learning specialized care beyond basic first aid. With the assistance of KidSIM and Homecare, simulation was introduced on their buses. Two different scenarios were repeated for all staff members who work on the bus (bus drivers, aids, LPNs) within their actual teams until they felt competent and had practiced these potential situations. Both skills and process perspectives were addressed during these sessions. Staff members reported increased confidence in managing medical emergencies on the bus and improved skills following these training sessions.

"I had my first day on route with both of my kids had seizure and tracheostomy, so after this training I get to know more about how to take care in an emergency"

"Learned lots from this training. Team members co-operation, practice, communication"

"Learned about how important teamwork is. Learned about seizure protocols and it helped that we did it in real life situation"



Home Nutrition Support Program (HNSP) **NEW!**

The Home Nutrition Support Program (HNSP) plays a crucial role in assisting families in caring for their children with nasogastric tubes at home. However, the transition from hospital to home can be daunting, especially for families who are new to this experience. Recognizing the challenges families face in providing adequate care, the HNSP team has explored innovative methods to enhance their support. Simulation has been utilized to prepare all families for caregiving tasks and to alleviate the stress associated with providing this care at home. Incorporating simulation into the Home Nutrition Support Program represents a proactive approach to enhancing family education and support. By providing families with practical experience and confidence in caregiving tasks, simulation empowers them to navigate these unfamiliar tasks with greater proficiency and peace of mind. As the HNSP team continues to innovate and adapt to the evolving needs of families, simulation stands out as a valuable tool in promoting successful transitions from hospital to home for children requiring enteral nutrition support.

FCC CPR Training

KidSIM supports families whose children have a life-threatening cardiac condition that would require them to perform compressions and rescue breathing (CPR) and potentially the need to use an AED to treat the cardiac arrhythmias through defibrillation, the application of electricity to reset the heart into an effective rhythm. Teaching occurs in the Cardiology clinic on the use of the AED and then they are referred to KidSIM to have CPR and AED training that is adapted to suit their specific child. Traditional CPR courses do not address these unique types of situations. Families and their supports attend a 3-4 hour individualized course allowing them to practice CPR with feedback and practicing an emergency situation from start of the emergency, initiating CPR, using the AED, and to simulating EMS arriving. Families have appreciated their improved confidence and feeling of readiness. KidSIM has also been asked by families and schools to help them prepare for a child with a medical emergency in a school setting. Similar to Fire or Lock Down drills these schools are now incorporating medical emergency drills. This training has helped schools create, trial and train staff in their medical emergency plan.

FCC Seizure Program

This program benefits families through the use of simulation to support traditional seizure discharge teaching when going home from the hospital with a child who has a seizure condition. Using simulation, the families practice managing a seizure and administering medications in the simulated home environment. This program increases the confidence and skill level of family members who are discharged home with children who are at high risk of suffering seizures. This program was developed from a project that was generously supported by a grant through the ACH Foundation.

FCC Seizure Program with CPR Training

This program allows families the opportunity to practice the emergency management and care of their child while seizing who stops breathing. A need was identified that families are sent home with children who can have life threatening conditions and these families do not have any opportunity to learn how to deal with these emergencies. Families and their supports attend a 3-4 hour individualized didactic and hands-on teaching session which includes seizure management teaching and lifesaving skills and CPR training. The goal of these sessions is to provide the family and the child's support system the opportunity to practice using high fidelity simulators and CPR feedback manikins to become skillful at lifesaving skills.

FCC Home Care

Children with complex health care needs are cared for in the community. Simulation has been used to train home care staff to care for the children in a variety of settings including home and schools. This training includes new equipment that a child requires, maintenance of competency and to prepare staff for emergencies in the community.

FCC Tracheostomy Program

The CCAN (Children with Complex Airway Needs) Program, which was supported by the ACH Foundation in development and design, has been in place since January 2019. Thirty-one policies and procedures were revised into one large practice support document that encompasses the spectrum of care for these complex children from PICU, inpatients, home, and Rotary Flames House.

FCC Simulation in Educational Centers

Challenges in integrating children with complex health care needs into the educational system (preschool, daycare, kindergarten and schools) have been identified. Simulation has been used regularly to help the educational centers have a better understanding of the child and their needs, and to practice the specialized emergency care that child may require. This program occurs in the educational centers and provides education and simulation for all the staff involved in the child's care, including bus drivers in their centers and utilizes the child's personal equipment such as wheelchairs and standing frames. The staff become prepared for an emergency situation and have had the opportunity to create and trial a plan prior to an incident. Emergency Medical Services (EMS) have also been involved in these simulations to create a plan identifying the unique emergency care requirements of each child to mitigate risks and to prepare EMS staff.



Christine Meikle School Emergency Preparedness

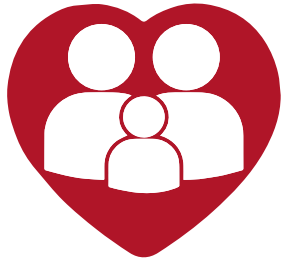
KidSIM, continues to focus on emergency preparedness in educational settings. A larger project has been partnering with Christine Meikle Calgary Board of Education (CBE) school. Christine Meikle School caters to junior high and high school students with moderate to severe cognitive disabilities and complex needs. The school's programming emphasizes the development of communication, independence, and vocational skills tailored to each student's abilities.

Given the unique needs of the students, medical emergencies, including seizures, physical injuries, low blood sugar, and respiratory distress, occur frequently within the school. To address this, CBE, Alberta Health Services (AHS), and KidSIM collaborated to identify the challenges specific to medical emergencies in the school environment.

Together a comprehensive plan was created that offers a standardized approach and utilizes supportive tools to guide the school staff. Two separate education/simulation sessions were conducted during the school year, each involving all staff members, including teachers, behavioral therapists, and educational assistants. These simulations were designed to educate the staff on managing individuals with medical emergencies and ensuring the safety of other students in the building. Evaluations were collected after each session to ensure that the education and simulation methods effectively met the staff's needs.

The benefit of this collaboration and training has been in the staff's confidence of understanding the process of calling for help/911 and this collaborative effort and simulation-based training exemplify the commitment to providing a safe and supportive environment for students with unique medical requirements. Further simulation opportunities to maintain skills, knowledge and confidence are planned for the 2024/2025 school year.

FCC ANNUAL SUMMARY



72

TOTAL FCC SESSIONS

The KidSIM Family Centered Care Program continues to expand support to children, families and caregivers.



151

FCC CAREGIVERS

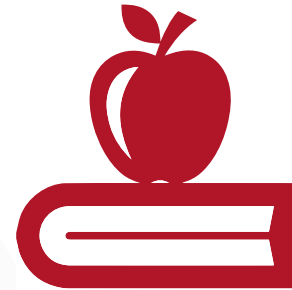
KidSIM provides training to caregivers supporting children in the community.



116

FAMILY MEMBERS

KidSIM provides ongoing support to all family members requesting education.



206

SCHOOL STAFF

KidSIM provides onsite specialized training to daycare and school staff.

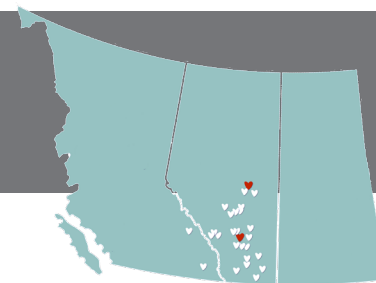


11

SCHOOLS/DAYCARES

KidSIM provided 11 total sessions of education to support daycare and school staff.

MOBILE EDUCATION



Since 2007, the KidSIM Mobile Education program has delivered in-situ pediatric education to rural and community partners. KidSIM fosters supported learning environments where team members can work through common pediatric scenarios and have the opportunity to respond in real time to pediatric medical emergencies in a controlled and safe environment. These sessions, provided by a multi-disciplinary team of pediatric experts, ensure front-line providers at rural sites are supported and trained to provide pediatric patients across central and southern Alberta with the best quality of care. KidSIM also uses these opportunities to enhance team skills and identify latent safety threats in the work environments. An adjunct to our Simulation Education is a hands-on workshop where key critical resuscitation skills are reviewed and practiced. Telehealth is used to regularly incorporate the transport team during mobile education sessions. This provides an added layer of realism and education to mobile education and is a launching pad for the transport program to widely implement the use of telehealth technology for all calls coming in to the team.

Mobile Education and ACH Neurocritical Care Team NEW!

This year the Mobile outreach team collaborated with the ACH Neurocritical care team with a goal of improving education and management of Pediatric status epilepticus. Our joint goal was to increase knowledge and utilization of a new ACH status epilepticus treatment pathway. In order to achieve this goal, we explored barriers with each site, collected data on the number of sites who stocked the recommended medications and educated the front line providers about the pathway. We invited physician members of the Neurocritical care team to join us on some of our mobile trips so that they could see first hand the challenges of managing these patients in rural sites and could help provide in person education based on their research data and experiences.

Impact: improved staff confidence with new processes, improved patient safety and outcomes, latent safety threats identified and mitigated

Improving Pediatric Acute Care through Simulation (IMPACTS)

The ImPACTS (Improving Pediatric Acute Care through Simulation) collaborative was created to ensure that ill and injured children receive the highest quality of emergency care whenever and wherever it is needed. Currently, there are disparities in pediatric emergency readiness, quality of care and outcomes across emergency departments in Canada and the U.S. and the majority of children are cared for in non-pediatric hospitals who may lack the resources and personnel to effectively care for pediatric emergencies. The ImPACTS protocol is an innovative improvement intervention involving Children's Hospitals "hubs" collaborating with Community Hospital "spokes" supported by a central "core" based out of Yale University with the goal of improving overall pediatric readiness at "spoke" sites. The KidSIM Mobile Education Program joined ImPACTS in January 2019 and is currently actively engaged with "spoke" sites in this quality improvement intervention.



18

EDUCATION DAYS

The Mobile Education team visited 11 different sites, including overnight and return trips, this provided 18 days of education.



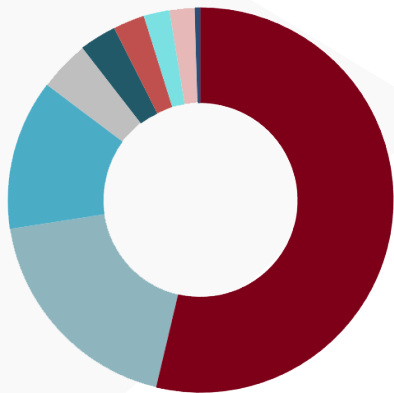
11

SITES

High River, Red Deer, Black Diamond, Airdrie, Banff, Vulcan, Drumheller, Okotoks, Cranbrook, South Calgary Health Center, and the Sheldon Chumir Health Center.

190

LEARNERS



- Attending Physicians 36
- Fellows/Residents 24
- Medical Students 6
- Registered Nurses 102
- Nursing Students 4
- Licensed Practical Nurses 5
- Nurse Practitioner 1
- Respiratory Therapists 4
- Emergency Medical Services 8



"Thank you so much for yesterday!!! People were so happy and loved it. The participants in IO insertion were raving about the scenarios and the learning. Well done!!! I think it was great that they then had a seizure patient that came in that just reinforced all the points that you taught. They found out that fosphenytoin is on back order! So Keppra was pulled from the pharmacy. Thanks again so much for braving the long day and sharing your knowledge!"

"What an excellent sim team that you have there! They were kind, engaging, accommodating and had a wealth of knowledge. Thanks again to all your team!"

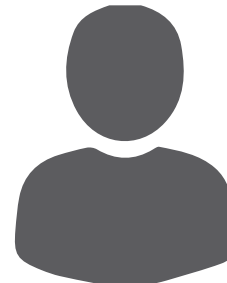
ANNUAL SUMMARY



2724

SESSION HOURS

The KidSIM Program had a 22% increase in simulation session hours from 2022.



5114

LEARNERS

The KidSIM Program had a 33% increase in the total number of learners from 2022.



670

SESSIONS

The KidSIM Program had a 25% increase in number of simulation sessions from 2022.



139

FACILITATORS

The KidSIM Program collaborates with 139 trained simulation facilitators and educators across ACH.



88%

KIDSIM CENTER

The majority of simulation sessions take place in the KidSIM Center. 10% take place in-situ within ACH and 2% take place off-site.

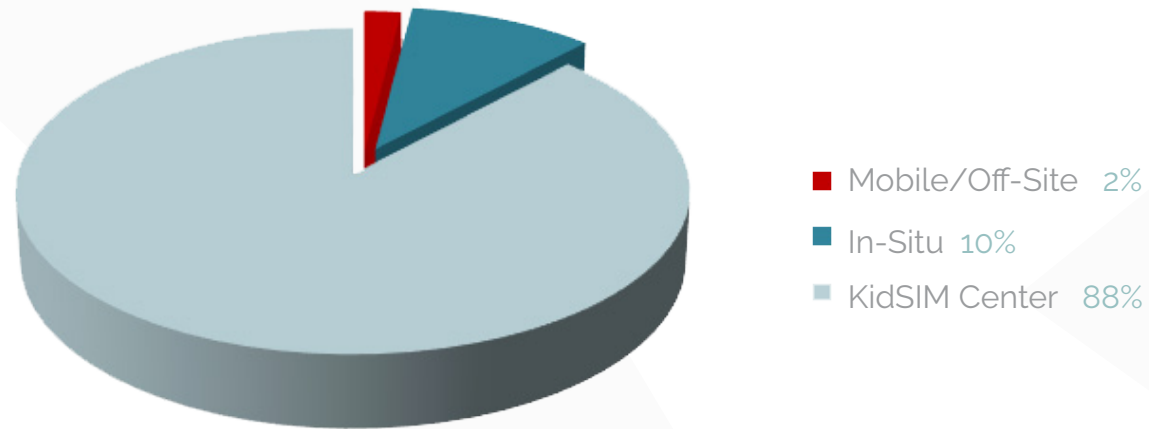


92%

TEAM TRAINING

Team training continues to be a main priority for the KidSIM Program.

DISTRIBUTION OF KIDSIM SESSION LOCATIONS IN 2023



2023 SIMULATION HOURS BY PROGRAM



2023 LEARNERS BY GROUP

Attending Physician **335**

Resident **794**

Fellow **119**

Medical Students **164**

Nurse Practitioner **20**

Registered Nurse **2240**

Nursing Student **217**

Licensed Practical Nurse **330**

Health Care Aide **32**

Family Member **116**

School Staff **206**

Respiratory Therapist **269**

RT Student **36**

EMS/Paramedic **34**

Housekeeping **1**

Security **34**

Other **188**

SIMULATION HOURS BY PROGRAM

User Group	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ED	372	429.5	399	498.75	379	404.05	459	622	695.5	766.5	989	935	752	368	460	610	720.5
ICU	128	112	97.5	152	132	82.25	70.5	81.3	104.5	107	202	189	75	47	30	86	80.5
NICU	n/a	n/a	n/a	n/a	n/a	n/a	2.5	2	73	101	214	131	200	106	198	197	212.5
RT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	185	1	56	54	16
Transport	n/a	n/a	n/a	n/a	n/a	n/a	36.5	39.25	38.25	133	133	163	94	10	88	96	100
OR/PACU	10	53	40.5	59.5	35.9	12.5	19.8	55.4	46	77.5	91	159.5	114	7	30	98	94
In-patient Units	137.4	70	158.5	141.5	175.25	133.15	123.75	124.15	202.5	267	350.5	403	325	182	138	235	250
Out-patient Clinics	8	4	4	13.5	17	16	0	0	0	28	18	50	15	44	50	7	23.5
Mobile	62.5	122	80	368.5	134.5	161.3	106.5	145.25	187	205	178	133	191	80	44	145	135
Courses	82	59	50	91.5	28.5	61.3	87	183.5	426	465	586	250.5	568	356	361	294	561.5
Research	n/a	n/a	n/a	n/a	n/a	74	51.5	8.4	31	120	41	48	93	57	65	42	111
FCC	n/a	n/a	n/a	n/a	n/a	n/a	6	10.75	30	150.5	430	298	224	120	115	194	220
Palliative Care	n/a	n/a	n/a	n/a	n/a	n/a	n/a	13.25	5	8	0	9	17	1	1	24	16.5
Other	16.5	0	0	4.5	23	11	6.5	3.5	15	5	2	0	49	44	0	8	32
GNO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	28	106.5	46	32	62	0	100	131	140
Mental Health	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	1
Return to Wellness	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10
TOTAL	816.4	849.5	829.5	1329.75	925.15	955.55	969.55	1288.75	1881.75	2540	3280.5	2801	2964	1423	1736	2224	2724

LEARNERS

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Learners	3243	3175	3471	4446	4436	4892	6514	6132	5481	3248	2680	3851	5114

SIMULATION SESSIONS BY PROGRAM

User Group	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ED	152	155	188	174	145	186	132	154	143	160	201	179	151	107	97	150	174
ICU	53	44	55	62	65	45	43	38	65	58	86	76	54	27	21	46	39
NICU	n/a	n/a	n/a	n/a	n/a	n/a	1	1	14	13	24	19	26	10	27	31	26
RT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22	1	8	13	11
Transport	n/a	n/a	n/a	n/a	n/a	n/a	24	27	18	11	68	33	37	3	23	22	43
OR/PACU	5	21	31	15	15	11	8	27	19	34	37	45	44	6	13	28	51
In-patient Units	36	23	54	37	52	59	52	49	77	90	111	101	60	127	48	69	106
Out-patient	4	2	1	6	4	4	0	0	0	3	9	11	9	37	31	4	17
Mobile	12	16	28	45	27	32	21	31	24	28	30	22	29	10	5	20	18
Courses	27	15	18	22	13	21	46	36	80	43	55	34	56	27	34	40	42
Research	n/a	n/a	n/a	n/a	n/a	24	25	11	21	39	28	11	49	23	32	14	37
Palliative Care	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	3	2	0	4	5	1	1	7	2
FCC	n/a	n/a	n/a	n/a	n/a	n/a	3	8	21	50	75	76	69	38	42	72	72
Other	7	0	0	3	23	5	3	2	6	3	2	0	8	9	0	6	13
GNO	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	13	6	7	7	49	9	9	14
Mental Health	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	1
Return to Wellness	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4
TOTAL	296	276	375	364	344	387	358	393	495	547	732	618	626	475	391	534	670

KIDSIM FELLOWSHIP

The KidSIM Pediatric Simulation Program offers a Fellowship in Simulation Education and Research. This Fellowship is offered in collaboration with the Medical Education Specialization Program at the University of Calgary. The overall aim of this fellowship is to prepare the candidate for an academic career as a simulation educator, with advanced knowledge and skills in the delivery of simulation-based education and research.

Educators from the University of Calgary have developed a longitudinal simulation-based education and research curriculum for fellows from across the various simulation fellowship programs associated with the University of Calgary. It is hoped that this curriculum will provide an opportunity for fellows to collaborate and work with a broad array of simulation-based educators and researchers in Calgary. The program aims to foster a solid grounding in the theory and practice of simulation via interactive teaching on various elements of simulation in education, research, and integration into systems, quality, and patient safety programs. The KidSIM Program was involved in the planning and launch of this curriculum and several KidSIM Faculty are instructors. KidSIM has also partnered with the Hospital for Sick Children in Toronto to offer joint journal club, hot topic and lecture series for fellows at both ACH and SickKids.

KIDSIM FELLOWSHIP OBJECTIVES

1. Demonstrate knowledge of concepts in adult learning theory, experimental design, evaluation, and computer applications in simulation-based education.
2. Participate in the development of innovative simulation-based teaching strategies for all levels of learning: undergraduate and postgraduate trainees, as well as continuing education for healthcare providers.
3. Participate in the delivery of interprofessional education by an interprofessional teaching team.
4. Demonstrate knowledge of key issues in simulation-based education relevant to both the simulation learner and the simulation educator.
5. Initiate, design, conduct, present and or publish a simulation-based research project with the mentorship of the KidSIM-ASPIRE research program leaders.
6. Participate in the structured KidSIM Simulation Fellowship curriculum and other educational opportunities (ie outreach simulation, rounds).
7. Demonstrate a commitment to medical education by considering enrollment in a graduate degree program in education (Masters or PhD).

JOURNAL CLUB AND LECTURE SERIES

KidSIM Fellows and Graduate Students participate in a regular monthly lecture series and journal club, which serves three main purposes:

1. To review the latest evidence and best practices in simulation; and
2. For the trainees to be exposed to the various methods of conducting simulation-based research; and
3. To provide the trainees further experience in formal presentation skills.

KIDSIM ELECTIVES

The KidSIM program developed an elective rotation for residents and fellows with an interest in developing skills and experience in simulation-based education. In the 2023-2024 academic year, 1 resident from the University of Calgary completed the elective rotation.

FOUR MAJOR COMPONENTS

SIMULATION PROGRAM OPERATIONS

Residents will demonstrate an understanding of the basic planning, organization and operation of a simulation center. Residents will also understand the value of experiential learning in adult education and how simulation is an ideal tool for that type of learning. Residents will also demonstrate an understanding of the different simulation equipment available.

SIMULATOR TECHNICAL SKILLS

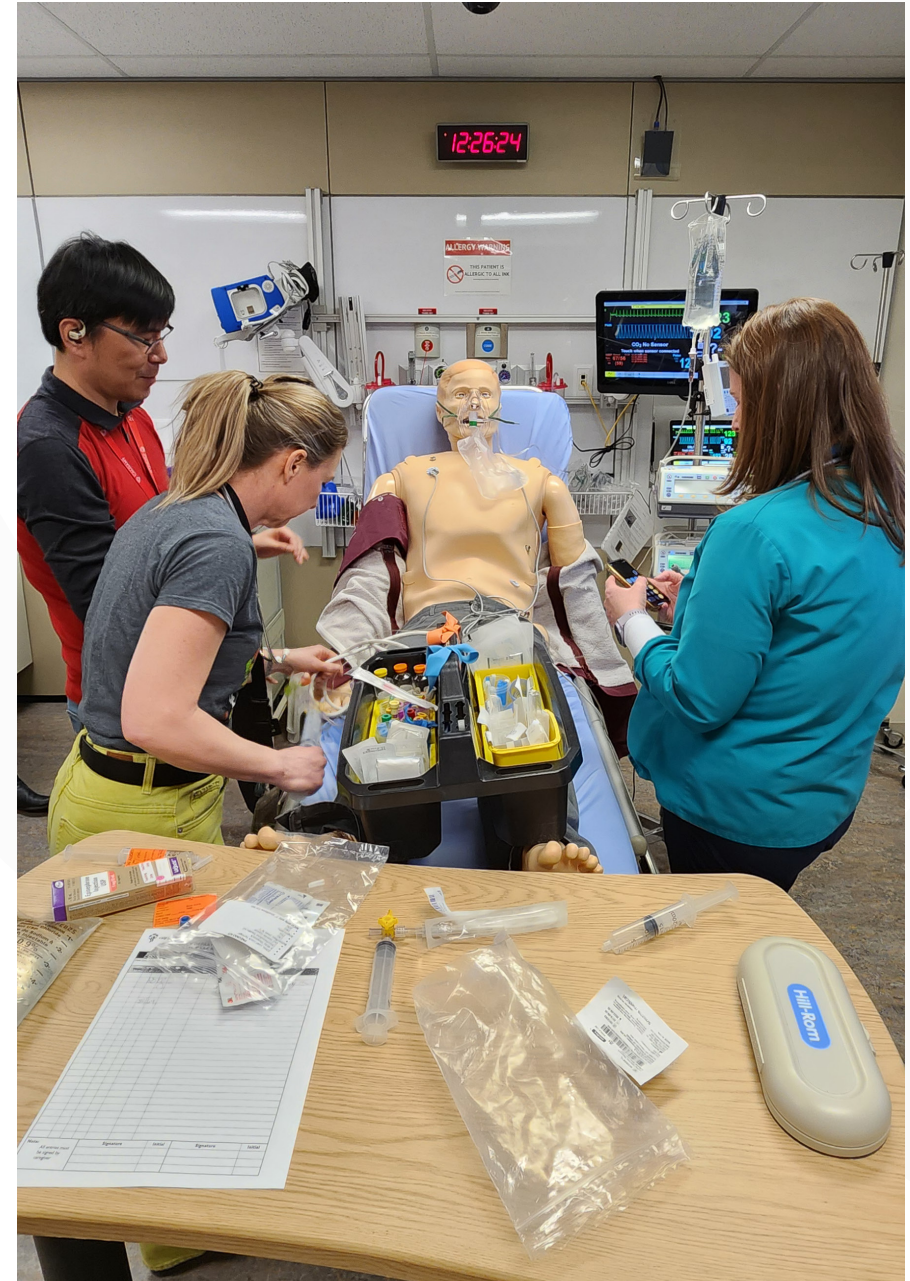
Residents will demonstrate the basic use of the simulation equipment and software being used in the KidSIM Program. Residents will also demonstrate how to facilitate a scenario for learners.

DEBRIEFING SKILLS

Residents will demonstrate how to run an effective debriefing session following a simulation scenario. Most of the time in the rotation will be spent practicing and consolidating these skills. Residents are encouraged to get involved in as many sessions as possible, and to take advantage of this practice in the presence of an experienced facilitator.

SCENARIO DEVELOPMENT

Residents will demonstrate an understanding of the aspects and development of an objective-based scenario, including relevant roles, props and audiovisual aides.



FACULTY DEVELOPMENT

PACE PROGRAM

www.pace4kids.org
pace@kidsim.ca



PACE is Pediatric Acute Care Education for health care providers. The PACE Program at KidSIM works to provide learners surrogate clinical experience with pediatric patients in as close to a 'real-life' situation as possible through the use of high-fidelity mannequins as well as teaching space that mimics the clinical setting as closely as possible. PACE incorporates leading-edge simulation technology run by Western Canada's top pediatric emergency medicine and critical care educators. Hands-on teaching using the latest evidence-based medicine practices is a key focus, making PACE the best choice for emergency physicians, pediatricians, family physicians, NPs, nurses and allied healthcare professionals to maintain their Pediatric Acute Care Education.

The PACE Program offers the following courses:

- Pediatric Advanced Life Support (PALS) Provider
- Pediatric Advanced Life Support (PALS) Provider Hybrid
- Pediatric Advanced Life Support (PALS) Provider ED Staff
- Pediatric Advanced Life Support (PALS) Renewal
- The Pediatric Airway Course (TPAC)
- Basic Cardiac Life Support (BCLS)
- Pediatric Emergency Assessment, Recognition, and Stabilization (PEARS) Provider Course
- Neonatal Resuscitation Program (NRP) Course
- Emergency Nursing Pediatric Course (ENPC)
- Trauma Nurse Core Course (TNCC)



DEBRIEF 2 LEARN

www.debrief2learn.org

Effective feedback and debriefing play a critical role in healthcare education in both simulated and workplace-based environments. Developed by KidSIM leadership in collaboration with global experts in simulation, Debrief2Learn supports clinical educators by sharing resources to guide faculty development and exploring the latest innovations. We aim to create an online community of practice for health professions educators while advancing knowledge through cutting-edge collaborative research.

ADVANCED SKILLS FOR SIMULATION EDUCATION & TEACHERS (ASSET)

www.kidsim.ca

info@kidsim.ca



The ASSET program introduces participants to all of the concepts of simulation, as well as provides practical experience in the delivery of simulation-based education. Courses consist of learners from various healthcare provider backgrounds, including medicine, nursing, respiratory therapy, among other healthcare professionals. KidSIM offers both in-person and virtual ASSET courses. In 2023, KidSIM formally trained 83 Simulation Facilitators.

ASSET FOUNDATIONS

Foundation of Simulation Education and Debriefing

ASSET Foundations is a two-day course that provides a broad overview of core simulation concepts and principles to novice and intermediate simulation educators. By the end of the course, the participants will be able to design and run their own simulation and feel comfortable facilitating the debriefing session that follows. KidSIM also offers a one-day ASSET Foundations Refresher course for those who have already taken Foundations and require an overview of core simulation concepts and principles.

50 trained facilitators in 2023.

ASSET CO-DEBRIEFING

Strategies for Effective Co-Debriefing

ASSET Co-Debriefing is a one-day course for intermediate simulation instructors who have experience with running simulation with another colleague and the difficulties that arise from doing this. By the end of the course the participants will learn techniques to address these challenges and skills to effectively run scenarios and debrief with colleagues.

12 trained facilitators in 2023.

ASSET FAMILY

Strategies to Integrate Simulation Education into Discharge Teaching

ASSET Family is a one-day course for anyone involved in patient and family education or discharge teaching. By the end of the course the participants will learn specific strategies to design, deliver, and debrief simulation scenarios targeted specifically to patients and families.

ASSET ADVANCED

Advanced Toolbox for Difficult Debriefing Situations

ASSET Advanced is a one-day course for intermediate simulation instructors (ideally with at least 12 months of simulation and debriefing experience) designed to provide advanced debriefing skills and techniques. Participants will be introduced to common debriefing challenges and pitfalls, including some important ways to avoid them. Participants will also be introduced to an advanced toolbox of debriefing skills designed to help overcome difficult debriefing situations. Videos of simulation scenarios will be used as the basis for discussion, debriefing practice and feedback.

12 trained facilitators in 2023.

ASSET PEER COACHING

Strategies for Providing Effective Feedback to Peers and Colleagues

ASSET Peer Coaching is a one-day course for intermediate simulation instructors who have experience running simulations with another colleague. Participants will explore how to provide effective feedback to peers and colleagues in a way that is non-threatening and how to seek constructive feedback from colleagues to identify learning gaps in their own practice. By the end of the course the participants will learn techniques to define and describe the benefits of peer coaching; highlight strategies for creating a culture for peer coaching; describe elements of pre-briefing, scenario execution and debriefing performance that can be explored when coaching peers; and apply tools designed to help with peer coaching.

9 trained facilitators in 2023.

RETURN ON INVESTMENT

Return on Investment (ROI) Overview

Over the past few decades, simulation has been integrated into the fabric of medical education across specialties and professions. Simulation-based medical education is effective, but the establishment and maintenance of a program is also incredibly resource-intensive. Although it is generally believed that investing in medical education will benefit society by improving the quality of delivery of healthcare, decision makers will need some means to know that an investment will be fruitful compared with other alternatives that might be available. The determination of ROI consists of the 3 main parts below:

- (1) Estimation of the costs
- (2) Measuring the benefits
- (3) Linking the costs and benefits

All stages of simulation activities need to be considered when estimating the costs of a simulation program. The cost components include personnel, equipment/supply, operation and maintenance, facility/space, administration, productivity loss, and others. Some situations need special consideration such as depreciation of the equipment, shared costs across programs, volunteer time and discount rate of the cost.

The benefits of simulation-based training include but not limited to improved self-confidence, improved knowledge, technical skills, and non-technical skills, changed behavior and improved patient outcomes. When simulation is used to improve the system, the benefits are improved patient safety, detection of latent safety threats. We will attempt to turn these benefits into monetary units for the calculation of ROI. To deal with some intangible benefits, we measure the willingness-to-pay for the learners. The return-on-investment is calculated by linking the costs and benefits. Most of the previous literature used cost avoidance. The comparison of willingness-to-pay and actual costs

is an alternative for ROI. For those projects with a comparison, incremental cost-effectiveness ratio (ICER) is usually used to determine cost-effectiveness.

ROI Program Spotlight - Pediatric Emergency Medicine Attending Physician Interprofessional Simulation Education **NEW!**

The emergency department now conducts monthly simulation sessions that include attending physicians, staff nurses, and respiratory therapists. These sessions primarily focus on the management of acutely ill pediatric patients to enhance the quality of care provided. Whenever feasible, the training is conducted in the Trauma room at Alberta Children's Hospital Emergency Department, which adds realism to the scenarios and facilitates the evaluation of existing systems.

Cost Estimation

The costs for each session are estimated based on four facilitators (two MDs and two RNs) for eight participants (four MDs and four RNs/RTs), involving two simulation scenarios across two labs over two hours.

Benefit Measurement

The benefits of the ED attending physician interprofessional training were evaluated in 3 aspects. (1) The perceived improvement in management of emergency cases evaluated by the learners themselves; (2) The relative value of training compared with other educational strategies; (3) Willingness-to-pay for the training

Return on Investment

Compared to other educational strategies, the ROI of this interprofessional simulation training relative to other methods of professional development is 170.4%. This means that if investing \$100 on interprofessional simulation-based training, the benefit achieved is worth \$170.40.

ROI Program Spotlight - Christine Meikle School Project **NEW!**

Last year, the KidSIM Center initiated a pivotal training program at Christine Meikle School (CMS), in collaboration with Alberta Health Services Home Care, Emergency Medical Services (EMS), and the Calgary Board of Education (CBE). Catering to junior high and high school students with moderate to severe cognitive disabilities and a spectrum of complex needs, the program was designed to enhance staff preparedness for frequent medical emergencies such as seizures, hypoglycemia, respiratory distress, and infections—events that typically require urgent 911 interventions due to the students’ delicate health.

The comprehensive training provided not only covered emergency management procedures but also focused on fostering non-technical skills critical for effective teamwork. A notable innovation was the introduction of a color-coded card system, which clearly delineated the roles of each team member, enhancing clarity and coordination during crises. In-situ simulation-based training was another key component, aimed at reinforcing skill acquisition and ensuring consistent application in real-world scenarios. These simulations were specifically tailored to prepare staff to manage medical emergencies efficiently while safeguarding the wellbeing of all students.

Feedback collected after each training session helped to assess and confirm the effectiveness of the educational and simulation strategies in meeting the staff’s needs. This collaborative initiative has markedly boosted the confidence of the staff in managing emergencies, understanding the protocols for emergency response, and maintaining a secure and supportive environment. The continued commitment to providing further simulation opportunities underscores an ongoing dedication to enhancing skills and knowledge, ensuring the school is well-prepared for any situation that might arise.

Cost Estimation

The estimation of the costs considered all three phases of the training program: (1) Curriculum design and preparation; (2) Implementation of the training program; and (3) Follow up and evaluation.

Benefit Measurement

The benefits of the training program were evaluated based on 1 year follow-up survey from the participants in 3 aspects: (1) Perceived improvement in management of medical emergencies; (2) Self-evaluation of training and impact; (3) Training impact relative to other educational strategies.

Return on Investment - Education Costs Perspective

Compared to other educational strategies, this KidSIM training program achieved a ROI of 122%. For every \$100 invested in this program, the benefit achieved is worth \$122.

Return on Investment - Healthcare Costs Perspective

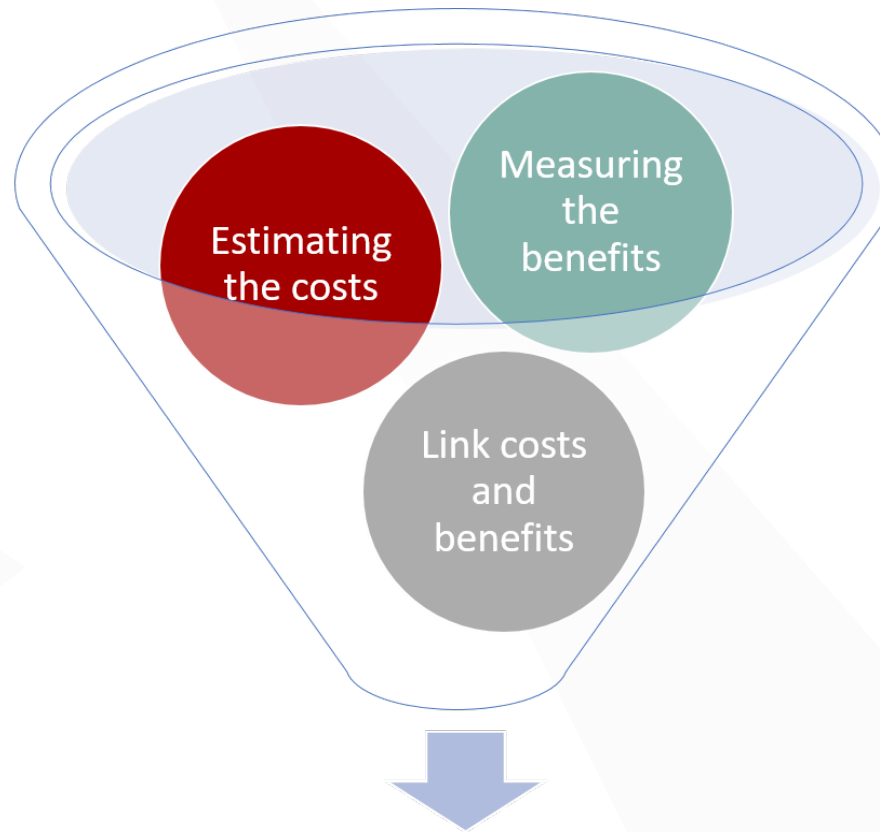
According to the 2022 AHS report, the average cost of a single hospitalization is approximately \$9,175. Given the high-risk of medical incidents among the medically vulnerable children at Christine Meikle School (CMS), it is reasonable to suggest that timely intervention by school staff and medical professionals can mitigate potential harm and possibly reduce the likelihood of subsequent hospitalizations. This proactive approach not only ensures better health outcomes for these children but also potentially decreases healthcare costs associated with emergency treatments. The following table presents the association between number of hospitalizations prevented and potential medical costs saved, and ROI associated.

The estimation provided above suggests that preventing even a single hospitalization would result in a 45.6% return on investment in terms of patient costs, in addition to the numerous educational benefits.

# of hospitalizations prevented	Potential medical costs avoided	ROI (%)
1	\$9,172	45.6%
2	\$18,344	191.2%
3	\$27,516	336.8%
4	\$36,688	482.3%
5	\$45,860	627.9%

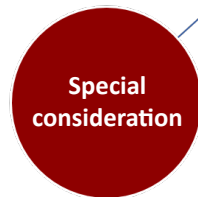
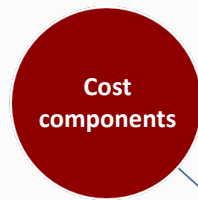
ROI FRAMEWORK

- Personnel
- Equipment/supply
- Operation/maintenance
- Administration
- Facility (space)
- Productivity loss
- Others
- Consider costs in all phases
 - » Needs assessment
 - » Scenario design/development
 - » Implementation of simulation
 - » Post event activities (assessment/evaluation/follow-up/PDSA cycle)
- Consider shared costs/depreciation rate/discount rate



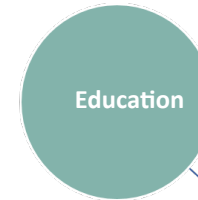
- Kirkpatrick pyramid
 - » Satisfaction, confidence, reaction
 - » Learning
 - » Behavior change
 - » Patient outcome
- Willingness to pay
- Latent safety threat detection
- Patient safety
- Retention of healthcare providers
- Cost avoidance associated with the benefit
- Incremental cost-effectiveness ratio
- Actual cost vs willingness-to-pay

- Personnel
- Equipment/Supply
- Operation/maintenance
- Administration
- Facility (Space)
- Productivity loss
- Others



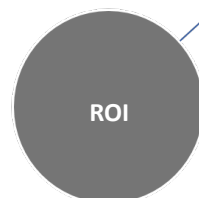
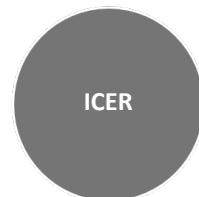
- Needs assessment
- Scenario design/development
- Implementation of simulation
- Post-event activities (assessment / evaluation/ follow-up / PDSA cycle)
- Shared costs
- Depreciation
- Discount costs
- Volunteer time/donation

- Reaction/ Satisfaction
- Knowledge, technical and non-technical skill
- Behaviour change
- Patient outcomes



- Latent safety threats detection
- Healthcare providers retention
- Patient safety

- Willingness to pay



- Potential decreased costs due to the intervention

- Incremental cost-effectiveness ratio

- Percentage of additional benefits over costs

KIDSIM-ASPIRE PROGRAM

The KidSIM-ASPIRE (Assessing Simulation in Pediatrics: Improving Resuscitation Events) Simulation Research Program at Alberta Children's Hospital was established to bring together an interprofessional group of Alberta-based leaders in clinical care, education, human factors, engineering, computer science and psychology interested in improving the delivery of healthcare to sick infants and children. Our team has developed a solid foundation which positions us well to address the main objectives of the acute and life-saving care pillar of ACH. Studies are formulated to identify novel and innovative methods of healthcare delivery in order to improve effectiveness and efficiency of care. In our collaborative research model, we also aim to facilitate the academic growth of young investigators and trainees by exposing them to established mentors both locally and worldwide and nurturing the skills necessary to become successful researchers.

After completion of several successful large-scale studies that have provided significant results and insight into acute care, KidSIM-ASPIRE is committed to translating the knowledge gained by the research findings. National pediatric emergency and pre-hospital care conferences, annual nursing education sessions, local nursing conferences, and international simulation conferences are venues where the research team has presented findings. Perhaps most importantly, these presentations focused on how recent findings need to be applied to improve provider education and patient care.

PROGRAM HIGHLIGHT

The KidSIM-ASPIRE Research Program is the most published simulation program in the world!



PROGRAM GOAL

The goal of the program is to conduct innovative, high-quality, simulation-based research to inform healthcare providers, administrators and families of best practices, which will optimize pediatric patient outcomes from illness. As lifesaving treatment in pediatric patients involves effective interprofessional care, we strive to conduct single and multicenter studies which involve various professions (nursing, respiratory therapy, paramedics, physicians etc) in order to optimize the impact of our research on patients.

RESEARCH PILLARS

In 2022, members of the KidSIM-ASPIRE team met to develop a common research strategic plan for the next 5 years, and to identify priorities and action items to help the collaborative achieve its research goals. The results of this consensus process helped to inform the development of 4 key KidSIM-ASPIRE research pillars, each with a specific aim for research.

RESUSCITATION AND CARDIAC ARREST

Goal: Develop and evaluate novel techniques and strategies for improving resuscitative care of pediatric patients suffering from cardiac arrest.

ARTIFICIAL INTELLIGENCE

Goal: Design, develop and evaluate the use of artificial intelligence to improve clinical skills training and assessment.

QUALITY IMPROVEMENT AND PATIENT SAFETY

Goal: Design and evaluate simulation-based interventions to enhance patient safety and improve patient outcomes.

RETURN ON INVESTMENT

Goal: Assess and evaluate the cost effectiveness of simulation-based training in healthcare.





Dr. Adam Cheng
Director, Research & Innovation, KidSIM-ASPIRE



Jennifer Davidson
Research Coordinator, KidSIM-ASPIRE



Dr. Jeffrey Lin
Outcomes Analyst, KidSIM



Nicola Peiris
Team Lead, KidSIM



Dr. Kerri Landry
Medical Director, KidSIM



Dr. Christine Kennedy
Assistant Medical Lead, KidSIM



Brandi Wan
Research Assistant



Helen Catena
Simulation Consultant, KidSIM



Amy Cripps
Simulation Consultant, KidSIM



Kerriane Craig
Simulation Aide, KidSIM



Keely Piscopo
Admin Assistant, KidSIM



Louise Simonot
Simulation Consultant, KidSIM



Joleen Lidberg
Research Assistant, ACH



Dr. Vincent Grant
Medical Director, eSIM



Wendy Bissett
Research Educator, ACH



Dr. Omar Damji
EM Physician, ACH



Dr. Martin Perlsteyn
Neonatology Physician, ACH



Dr. Donovan Duncan
Pediatric Intensivist, ACH



Dr. Kangsoo Kim
Assistant Professor, UCalgary



Ryan Kang, Masters Student, UCalgary



Kent Hecker
Researcher, UCalgary



Dr. Steve Lopushinsky
Pediatric General Surgery, ACH



Tom O'Neill
Psychologist, UCalgary



Alyshah Kaba
Provincial Scientific Lead, eSIM, PI & IHOT

KIDSIM-ASPIRE TEAM

ANNUAL SUMMARY

INTERNAL GRANTS

2024 – 2025	\$250,000 CAD	Project Title: AR-Screen: Development of a Decision Support System for Cardiac Arrest. Funded By: Alberta Children's Hospital Research Institute, Department of Pediatrics, and Alberta Children's Hospital Foundation. Project Involvement: Dr. Adam Cheng, Co-Principal Investigator
2023 – 2024	\$10,000 CAD	Project Title: Design and Development of an Augmented Reality Decision Support System for Cardiopulmonary Arrest. Funded By: University of Calgary Clinical Research Fund Grant. Project Involvement: Dr. Adam Cheng, Principal Investigator

EXTERNAL GRANTS

2024 – 2027	\$750,000 CAD	Project Title: AR-Screen: Evaluation of a Decision Support System for Cardiac Arrest: A Multicenter, Randomized Controlled Trial. Funded By: LevMax Health Grant, Alberta Innovates. Project Involvement: Dr. Adam Cheng, Principal Investigator
2023 – 2026	\$478,126 CAD	Project Title: Impact of Aerosol Box Use during Cardiopulmonary Arrest: A Multicenter, Randomized Trial. Funded By: Canadian Institutes of Health Research – Project Grant. Project Involvement: Dr. Adam Cheng, Principal Investigator
2023 – 2025	\$38,000 CAD	Project Title: Design and Development of an Augmented Reality Decision Support System for Cardiopulmonary Arrest. Funded By: NSERC Alliance – Alberta Innovates Advance Program. Project Involvement: Dr. Adam Cheng, Collaborator
2023 – 2025	\$292,000 CAD	Project Title: Development and Multicentric Evaluation of an Augmented Reality and Screen-based Decision Support System for Cardiopulmonary Arrest: An International Project. Funded By: HUG Foundation. Project Involvement: Dr. Adam Cheng, Co-Principal Investigator



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CITATIONS



17

PUBLICATIONS



8

PRESENTATIONS



6

GRANTS



5

ABSTRACTS

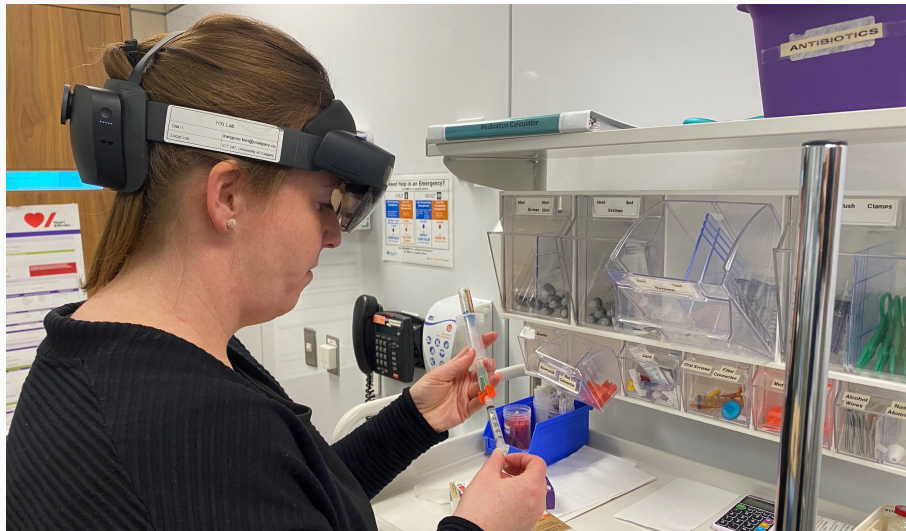


3

AWARDS

RESEARCH ACTIVITY

PROJECTS



AR-Screen: Development and Multicentric Evaluation of an Augmented Reality and Screen-based Decision Support System for Cardiopulmonary Arrest: an International Project **NEW!**

Dr. Adam Cheng, Dr. Johan Siebert, Dr. Frédéric Ehrler, Dr. Sergio Manzano, Dr. Arielle Levy, Dr. Kangsoo Kim, Dr. Jonathan Pirie, Dr. Todd Chang, Dr. Jeffrey Lin, Dr. Donovan Duncan, Dr. Jon Duff, Jennifer Davidson

This is a two-phase, multidisciplinary, international research project to evaluate, through phased studies and two-center trials, an innovative decision support system (InterFACE-AR) that leverages augmented reality to provide resuscitation teams with real-time, role-specific decision support during cardiac arrest. The first phase of the project aims to assess in a pilot multicenter, randomized, controlled trial (RCT) at two tertiary hospitals

(Geneva children's hospital, Switzerland; Alberta Children's Hospital, Canada) the AR-Screen decision support system that will be developed using an iterative prototyping approach. This project will take place over 2 years and will involve the participation of experts in 5 countries (Switzerland, Canada, Netherlands, USA, Italy). The results of Phase 1 will be used to set up Phase 2 of the project; a multicenter RCT at eight INSPIRE network sites (Geneva, Calgary, Italy, Montreal, Toronto, Birmingham, Los Angeles and New York City).

Evaluation of an Augmented Reality and Screen-based Decision Support System for Cardiopulmonary Arrest: A Multicenter, Randomized Controlled Trial **NEW!**

Dr. Adam Cheng, Dr. Johan Siebert, Dr. Frédéric Ehrler, Dr. Sergio Manzano, Dr. Kangsoo Kim, Dr. Arielle Levy, Dr. Jonathan Pirie, Dr. Todd Chang, Dr. Jeffrey Lin, Dr. Nancy Tofil, Dr. Jon Duff, Jennifer Davidson

This multicenter study will determine if use of an Augmented Reality Decision Support System (InterFACE-AR) improves performance and influences provider workload during cardiac arrest. The InterFACE-AR system is comprised of four key components that are interconnected: (a) two augmented reality devices (for the team leader and medication nurse); (b) a tablet-based Guiding-Pad app; and (c) an LCD screen. Participants forming resuscitation teams will be randomized into one of 4 study arms: either the control arm (i.e. pocket reference card only). Teams will participate in a simulated cardiac arrest scenario, with clinical performance metrics captured by video review and provider workload collected by survey. We expect to find that use of the new decision support system during cardiopulmonary arrest improves clinical care (i.e. time to epinephrine, time to critical tasks, CPR quality, reduced medication errors) and reduces provider workload. These outcome metrics have direct associations with patient survival, which will provide a strong argument for the integration of InterFACE-AR support systems into acute care environments.

Design and Development of an Augmented Reality Decision Support System for Cardiopulmonary Arrest

Dr. Kangsoo Kim, Dr. Jeffrey Lin, Dr. Adam Cheng, Jennifer Davidson

Prior studies from collaborators amongst our research team have demonstrated that use of augmented reality (AR) technology reduces medication errors, use of a tablet-based app improves adherence to ALS guidelines, and use of an LCD screen enhances situational awareness and team communication. Our primary aim is to design a novel decision support system for resuscitation teams and determine if use of the InterFACE-AR system improves adherence to guidelines during cardiac arrest.

Impact of Aerosol Box Use on Patterns of Healthcare Provider and Environmental Contamination during Aerosol Generating Medical Procedures: A Multicenter Study

Dr. Adam Cheng, Dr. Arielle Levy, Dr. Jonathan Pirie, Dr. Keya Manshadi, Dr. Todd Chang, Dr. Jeffrey Lin, Dr. Jon Duff, Dr. Andrew Dixon, Jennifer Davidson

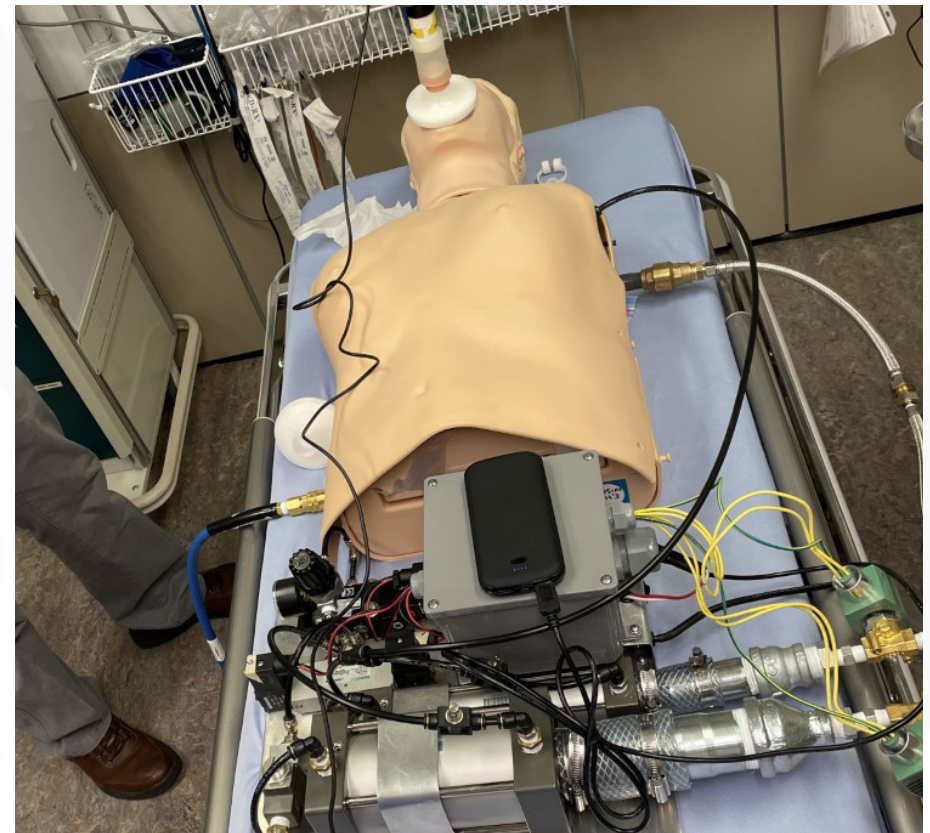
This study involves a prospective, randomized controlled trial at five pediatric hospitals (Alberta Children's Hospital, Stollery Children's hospital, Ste. Justine Hospital, Children's Hospital of Los Angeles, and The Hospital for Sick Children). The primary aim of this study is to further explore the effectiveness of an aerosol box - a hard sided plexiglass box that fits over the torso of a patient to act as a physical barrier that contains infectious droplets. Aerosol box use will be compared with no aerosol box use for reducing Health Care Provider (HCP) and environmental contamination during the provision of Cardiopulmonary Resuscitation during a resuscitation scenario. Other secondary aims are: (a) to compare provider workload while performing CPR in aerosol box vs. no aerosol box groups; (b) to compare quality of intubation performance in aerosol box vs. no aerosol box groups; and (c) describe the pros and cons of aerosol box use during AGMPs. This study is funded by the Canadian Institutes of Health Research (CIHR).

Portable Respiratory Simulator (PRISM) Validation Study

Jack Fu, Dr. Jeffrey Lin, Dr. Adam Cheng, Amy Cripps

Aerosol generating medical procedures (AGMPs) produce airborne viral particles that elevate the risk of infection for front-line health care providers (HCPs). Successive waves of the COVID-19 pandemic have heightened the

importance of understanding how aerosols behave in the clinical environment. Currently, there are no pediatric aerosolization models available that can accurately simulate breathing and aerosol production during AGMPs. A realistic model will allow us to: (a) better understand how droplets are spread during AGMPs; (b) assess strategies to minimize aerosol spread; and (c) better inform infection control practices and resuscitation guidelines. The pediatric Portable Respiratory Simulator (PRISM) aerosolization device has been developed at KidSIM and is capable of simulating physiologically realistic breathing and producing respiratory aerosols. The main objective for this project is to collect data to support PRISM's ability to simulate realistic respirations and generate respiratory aerosols for a child.



Accuracy of Visual Assessment in Resuscitative Ventilation: Does Point of View Make a Difference?

Dr. Gloria Yoo, Dr. Jeffrey Lin, Dr. Adam Cheng

Current methods of assessing resuscitative ventilation rely on visual assessment, oxygen saturation (SpO₂), end tidal CO₂ (EtCO₂), and lung auscultation. During resuscitation, the team leader needs to ensure effective and adequate resuscitation overall, which includes accurate quality of ventilation according to the most recent American Heart Association (AHA) guidelines. To do this, the team leader relies primarily on visual assessment of ventilation quality which at a minimum is ensuring appropriate RR based on various clinical contexts (i.e. ventilation with pulse, ventilation without pulse, ventilation with advanced airway). This study will determine the proportion of time, within a 6-minute simulated pediatric resuscitation recording, that health care providers accurately identify ventilation rates in compliance with the 2020 AHA guidelines. This will be a cross-sectional observational study consisting of an online questionnaire and 8 simulated scenarios based on two cases with varying ventilation quality from different viewpoints relative to the patient. Participants will rate the quality of ventilation in each of these simulated scenarios.

Evaluation of a Faculty Development Program for Simulation Educators – The KidSIM ASSET Experience

Dr. Mary Tong, Dr. Adam Cheng, Dr. Jeffrey Lin

Simulation training has been shown to strengthen medical education by enhancing acquisition of medical knowledge (e.g. ACLS algorithm), procedural skills (e.g. laparoscopic surgery, bronchoscopy, intubation), leadership and teamwork skills. The KidSIM simulation program has developed a specialized simulation faculty development program to teach aspiring educators the principles of simulation-based education. The Advanced Skills for Simulation Educators & Teachers (ASSET) suite of courses offered by the KidSIM Simulation Program at Alberta Children's Hospital encompasses 4 different courses. A better understanding of the impact of these courses will inform future faculty development efforts in simulation programs. The objectives of this survey-based study are to: (1) assess the downstream impact of ASSET course participation by describing participant professional profiles, involvement in simulation, and perceived utility on facilitation and debriefing skills; and 2) to identify gaps in their simulation and debriefing.

Keeping Fragile Feeders Safe: Utilizing Simulation Education to Enhance Patient Safety

Stacey Dalglish, Helen Catena, Rachelle Wanotch, Dr. Alixe Howlett, Dr. Sharron Spicer, Dr. Beverly Collisson

The 'Safe Feeding Experiences for Fragile Infants' sim was co-created by a multi-specialist team comprised of Speech Language Pathologists, a KidSIM Nurse Educator, and a Neonatal Nurse Practitioner, with the goal of enhancing patient safety during feeding interactions to reduce long-term adversity associated with unsupported feeding and swallowing development. Speech Language Pathologists employed at a tertiary care level hospital participated in these sims. Preliminary data analyses suggests increased knowledge, skills, proficiency, and self-confidence after participating in the simulation. The goal of the KidSIM Program is to provide similar opportunities to other allied health professionals, such as Occupational Therapists, Physiotherapists, and continue to include Speech Language Pathologists.

Virtual and Augmented Reality for Intubation Training As a Lifesaving Measure

Dr. Omar Damji, Dr. Vincent Grant, Dr. Christian Jacob, Dr. Pina Colarusso

Confidence, training environments, and direct comparability of a training unit to clinical practice are key facets needed for proficiency in procedural skill acquisition. Intubation is a critical skill in emergency medicine requiring competency. Simulator based task training has provided a safe and ethically appropriate method of skill acquisition, but training opportunities remain limited. VITAL XR focused on creating the best simulated learning environment and platform for medical training. This work bridges a gap between real-world medical challenges and technologies like virtual and augmented reality that can extend the capabilities of critical care training scenarios. This hybrid platform is intended to maximize practice opportunities for medical staff by reinforcing techniques and learning with a safe, simulated, yet realistic approach. Flesh, muscle, and bone feel real because of 3D scanning, printing, and casting in life-like materials. Intubation is a difficult procedure, and the platform aims to set up training simulations with ultra-realistic physical and digital components using artificial intelligence trained by expert practitioners to achieve deeper learning. Real-time guidance and correction via audio visual aids as well as tactile feedback will provide results driven simulation and practice opportunities.

The Umbilical Vein Catheter Insertion Assessment Tool

Dr. Martin Perlsteyn

The Umbilical Vein Catheter Insertion Assessment Tool project is looking to validate a novel checklist to assess for learner competency in performing umbilical vein catheter insertion on a Laerdal umbi mannequin prior to it being done on a real neonate.

PUBLICATIONS

1. Palaganas JC, Mosher C, Morton A, Foronda C, Cheng A, Anderson T. Engagement in Distance Healthcare Simulation Debriefing: A Concept Development and Framework. *Simulation in Healthcare*. 2024. In Press.
2. St-Onge-St-Hilaire A, Cheng A, Davidson J, Wan B, Lin Y. Completeness and Accuracy of Digital Charting vs. Paper Charting in Simulated Pediatric Cardiac Arrest: A Randomized Controlled Trial. *Canadian Journal of Emergency Medicine*. 2023. In Press.
3. Berg K, Bray J, Ng KC, Liley H, Greif R, Carlson J, Morley P, Drennan I, Smyth M, Scholefield B, Weiner G, Cheng A, Djarv T et al. 2023 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations: Summary from the Basic Life Support; Advanced Life Support; Pediatric Life Support; Neonatal Life Support; Education, Implementation and Teams; and First Aid Task Forces. *Circulation*. 2023. Published online Nov 9, 2023.
4. Breckwoldt J, Lockey A, Cheng A, Greif R et al. Stepwise Approach to Skills Teaching in Resuscitation: A Systematic Review. *Resuscitation Plus*. 2023; 16:100457.
5. Ko YC, Hsieh MJ, Schnaubelt S, Matsuyama T, Cheng A, Greif R. Disparities in Layperson Resuscitation: A Scoping Review. *The American Journal of Emergency Medicine*. 2023; 72:137-146.
6. Corazza F, Arpone M, Tardini G, Stritoni V, Mormando G, Graziano A, Navalesi P, Fiorese E, Portalone S, De Luca M, Binotti M, Tortorolo L, Salvadei S, Nucci A, Monzani A, Genoni G, Bazo M, Cheng A, Frigo AC, Da Dalt L, Bressan S. PediAppRREST – Effectiveness of a novel tablet application in reducing guideline deviations during pediatric cardiac arrest – a randomized clinical trial. *JAMA Network Open*. 2023; 6(8):e2327272.
7. Cheng A, Davidson J, Wan B, St-Onge-St-Hilaire A, Lin Y. Data-informed debriefing for cardiopulmonary arrest: A randomized controlled trial. *Resuscitation Plus*. 2023; 100401.
8. Lin Y, Savage T, Gravel G, Davidson J, Tofil N, Duff J, Cheng A for the INSPIRE CPR Investigators. Who is the real team leader? Comparing leadership performance of the Team Leader and CPR Coach during simulated cardiac arrest. *Resuscitation Plus*. 2023; 100400.
9. Cheng A, Pirie J, Lin Y, Lo C, Davidson J, Chang T, Matava C, Buyck M, Singer-Harel D, Colliat N, Neveu G, Pellerin S, Madadi M, Manshadi K, Wan B, Levy A for the INSPIRE AGMP Investigators. Aerosol Box use In Reducing Healthcare Worker Contamination during Airway Procedures (AIRWAY Study): A Simulation-based Randomized Controlled Trial. *JAMA Network Open*. 2023; 6(4):e237894
10. Stritzke A, Murthy P, Friedrich E, Assaad MA, Howlett A, Cheng A, Vickers D, Amin H. Advanced neonatal procedural skills: A simulation-based workshop: Impact and skill decay. *BMC Medical Education*. 2023; 23:26.
11. Cheng A, Bhanji F, Lockey A, Nabecker S, Greif R. Shaping the Future: Pressing Needs for Resuscitation Education Research. *Resuscitation Plus*. 2023; 13:100353.
12. INACSL Standards Committee, Persico, L., Ramakrishnan, S., Catena, R., Charnetski, M., Fogg, N., Jones, M., Ludlow, J., MacLean, H., Simmons, V.C., Smeltzer, S., Wilk, A., & Wilson-Keates, B., The Impact of Prebriefing on Simulation Learning Outcomes – A Systematic Review Protocol, *Clinical Simulation in Nursing*, <https://doi.org/10.1016/j.ecns.2023.101507>
13. St-Onge-St-Hilaire A, Cheng A, Davidson J, Wan B, Lin Y. Completeness and accuracy of digital charting vs paper charting in simulated pediatric cardiac arrest: a randomized controlled trial. *Canadian Journal of Emergency Medicine*. 2024 Feb;26(2):94-102.
14. Calhoun AW, Cook DA, Genova G, Motamedi SM, Waseem M, Carey R, Hanson A, Chan JC, Camacho C, Harwayne-Gidansky I, Walsh B, Lin Y. Educational and Patient Care Impacts of In Situ Simulation in Healthcare: A Systematic Review. *Simulation in Healthcare*. 2024 Jan 1;19(1S):S23-31.

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16. Lin Y, Lockey A, Greif R, Cheng A. The effect of scripted debriefing in resuscitation training: A scoping review. *Resuscitation Plus*. 2024 Jun 1;18:100581.
17. Berg KM, Bray JE, Ng KC, Liley HG, Greif R, Carlson JN, Morley PT, Drennan IR, Smyth M, Scholefield BR, Weiner GM, et al. 2023 International consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations: summary from the basic life support; advanced life support; pediatric life support; neonatal life support; education, implementation, and teams; and first aid task forces. *Circulation*. 2023 Dec 12;148(24):e187-280.

PRESENTATIONS

1. Maximizing the Impact of Simulation-based Research (Keynote). Transpacific Simulation Conference, Honolulu, USA. October 20, 2023.
2. Simulation-based research in healthcare (Workshop). Transpacific Simulation Conference, Honolulu, USA. October 18, 2023.
3. Psychological safety in debriefing (Workshop). Transpacific Simulation Conference, Honolulu, USA. October 18, 2023.
4. “Moving the Needle”: Simulation Strategies to Improve Outcomes from Cardiac Arrest (Keynote). Tristate Simulation Symposium, New York, USA. June 2, 2023.
5. Debriefing in Simulation-based Education (Educational Rounds). Mater Hospital Simulation Program. Brisbane, Australia. May 29, 2023.
6. Strategies to Improve Outcomes from Cardiac Arrest (Grand Rounds). Cleveland Clinical Critical Care Group. Cleveland, USA. May 23, 2023.
7. Evidence-based Strategies to Improve Outcomes from Cardiac Arrest (Keynote). UBC PEM Update 2023. Vancouver, Canada. May 5, 2023.
8. Maximizing the Impact of Simulation-based Research (Keynote). Cleveland Clinic Simulation Grand Rounds. Cleveland, USA. January 9, 2023.

ABSTRACTS

1. Singer-Harel D, Lin Y, Pirie J, Levy A, Buyck M, Collia N, Cheng A. Impact of aerosol box on healthcare provider workload during simulated aerosol generating medical procedures. International Pediatric Simulation Symposium and Workshops. Lisbon, Portugal. May 17, 2023.
2. Collia N, Singer-Harel D, Lin Y, Pirie J, Levy A, Buyck M, Cheng A. Simulation-based Evaluation of a New Videolaryngoscope Intubation Validation Tool. International Pediatric Simulation Symposium and Workshops. Lisbon, Portugal. May 17, 2023.
3. Cheng A, Pirie J, Lin Y, Lo C, Davidson J et al. Aerosol Box use in Reducing Healthcare Worker Contamination during Airway Procedures (AIRWAY study): A Simulation-based Randomized Controlled Trial. The International Meeting for Simulation in Healthcare. Orlando, USA. January 23, 2023.
4. Singer Harel D, Lo C, Madadi M, Davidson J, Cheng A, et al. Impact of aerosol box use on the workload of healthcare providers during simulated aerosol generating medical procedures: A simulation-based trial. The International Meeting for Simulation in Healthcare. Orlando, USA. January 23, 2023.
5. Cheng A, Pirie J, Lin Y, Lo C, Davidson J et al. Aerosol Box use in Reducing Healthcare Worker Contamination during Airway Procedures (AIRWAY study): A Simulation-based Randomized Controlled Trial. INSPIRE Network Annual Meeting. Orlando, USA. January 22, 2023.

AWARDS

1. December 2023 – Outstanding Achievement Award, Cumming School of Medicine, University of Calgary.
2. December 2023 – COVID – Outstanding Achievement Award, Summing School of Medicine, University of Calgary.
3. 2020 – 2025 – American Heart Association Volunteer Award (Dr. Yiqun Lin).

KIDSIM INTERNATIONAL

MISSION

To improve the quality of healthcare provided to infants and children around the world by collaborating with global partners through education, research and innovation using simulation.



PRIMARY STRATEGIES

INTERPROFESSIONAL EDUCATION

KidSIM has a wealth of experience in the provision of interprofessional simulation-based education, where healthcare providers from various professions train together in a collaborative work environment. Training in this type of environment using simulation helps to improve collective knowledge and skills, teamwork, communication and efficiency, which ultimately improve the care delivered to real patients.

RESEARCH

As one of the most successful simulation research programs in North America, KidSIM-ASPIRE will conduct research to study the impact of the education and innovation being delivered through KidSIM international programs, and also work hard to share and integrate knowledge acquired from existing research to global partners.

ASSESSMENT & EVALUATION

Assess and evaluate the impact of various models of interprofessional training on healthcare provider skills, knowledge and behaviors.

SIMULATION EXPERTISE & PROGRAM BUILDING

KidSIM has been the 'model' program in North America for growth based on little operational funding while keeping the education 'free' for the learners. Our experience in collaboration, identifying and grooming champions and growth based on limited resource will be a valuable asset to developing programs.

FACULTY DEVELOPMENT

As some educational techniques in simulation are more effective than others, our team have worked hard disseminate this knowledge to simulation educators locally and internationally by creating an instructor training course called ASSET.

FELLOWSHIP TRAINING

We train fellows to be future global leaders in simulation, who will take the knowledge, skills and experience from KidSIM fellowship back to their respective countries in order to save lives and improve outcomes of children in their area of the world.



www.KidSIM.ca

