ALLAN WATERS FAMILY SIMULATION CENTRE

Activity Report

St. Michael's

Inspired Care.
Inspiring Science.

Allan Waters Family Simulation Centre

ACTIVITY REPORT

EXECUTIVE SUMMARY

St. Michael's Hospital was a pioneer in simulation, opening Canada's second simulation centre in 1996. In 2011 the simulation centre moved from its one-room location in the hospital to its newly built, 4,000 sq. ft. state-of-the-art home in the Li Ka Shing Knowledge Institute across the street. It was renamed the Allan Waters Family Simulation Centre. In October 2014, the Royal College of Physicians and Surgeons of Canada Accreditation Committee unanimously granted the Allan Waters Family Simulation Centre a five-year accreditation status.

MISSION STATEMENT

To improve patient safety and quality of care by providing a safe learning environment to all patrons, interprofessionally and individually. We achieve this by offering quality simulation education and research opportunities, using a wide array of simulation modalities.

ABOUT THE CENTRE

The Allan Waters Family Simulation Centre is state of the art facility where students, health disciplines professionals, researchers, administrators and physicians can practice skills in a safe, realistic learning environment using high fidelity Human Patient Simulators, Virtual Reality and task trainers. Health care simulation involves a range of activities that share a similar purpose: to improve the safety, quality of care, interprofessional education, and effectiveness and efficiency of health care services.

The Centre houses more than 1.5 million dollars in capital equipment and provides customized clinical training and educational sessions to more than 5,000 internal and external health care professionals and students each year.

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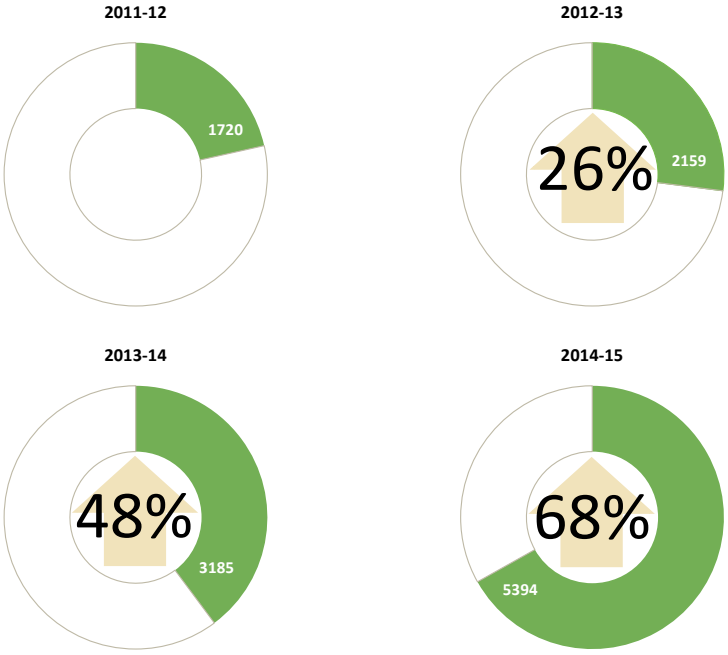
Left to Right: Ashley Rosen (simulation specialist), Roger Chow (education coordinator), Kimberley Krause (administrative assistant), Kari White (simulation educator), Susan Zelko (simulation specialist), Douglas Campbell (medical director), Nazanin Khodadoust (manager)

FACTS & FIGURES

Simulation Centre Participants



Participant Profile

26% Residents	**24%** Medical Students
16% Nursing Staff	**6-8%** Other Groups*

*Other Groups = health disciplines Staff (6%), staff physicians (7%), high school students (6%), external users (8%) and others (7%)

EVENTS

Annual Events

Annual Endoscopic Simulation Course

GTA Neuro Workshop

Military – MCRP Skills Practice

National Anesthesia Resident Assessments (First pilot in Canada)

National Simulation Olympics Training

Super CRT Ebola Preparedness Training

University of Toronto Out of Hospital Practitioners Continuing Medical Education Event

University of Toronto Surgical Exploration and Discovery Program (SEAD)

Annual Skills Days

Cardiovascular Intensive Care Unit

Cardiac Intensive Care Unit

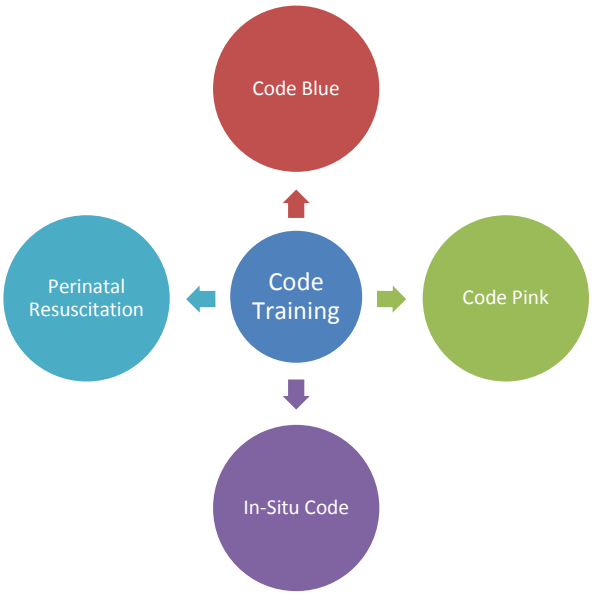
Catherization Lab

Cardiology

Medical/Surgical Intensive Care Unit

Trauma/Neurosurgery Intensive Care Unit

Cardiovascular Surgery



RECURRING EVENTS

- Anesthesia Crisis Recourse Management
- Cardiac Arrest and Therapeutic Hypothermia
- Cardiac Dysrhythmias
- Cardiac Ultrasound
- Critical Care Medicine Fellows Training
- Emergency Department Core Resident Teaching
- Emergency Medicine Simulation Curriculum
- Hemodialysis Emergencies
- Neurosurgery/Trauma Respiratory Education and Practice
- OB/GYN Resident Training
- Pain Management Course
- Spiritual Care Training
- Transfer of Accountability Centralized Education

EXPERTISE IN TEACHING AND LEARNING

St. Michael's offers a leading-edge educational environment. With a strong focus on inter-professional teamwork, we educate 3,200 students a year from every facet of health care, and emphasize lifelong learning for all staff.

COURSES AND TRAINING PROGRAMS

Basic Life Support	The BLS training course is an interactive team building program that is designed to train individuals to respond to cardiac arrests with a particular focus on the St. Michael's code blue protocols. Emphasis is placed on early recognition of a cardiac arrest, delivery of good quality cardiopulmonary and understanding the importance of early defibrillation for an adult within St. Michael's Hospital.
Advanced Cardiac Life Support (ACLS)	The simulation centre offers a Heart and Stroke ACLS program, including full certification and recertification courses. This course is intended for medical students, residents, staff physicians, nursing, and health disciplines staff.
Tracheostomy Care Course	Hands-on learning of skills including tracheostomy care, suctioning, weaning, and handling tracheostomy emergency situations; based on hospital policy and procedures. There is dedicated time to practice skills in realistic simulation sessions.
Basic Airway Management	This is an interactive, hands-on, simulation-based course covering basic airway management skills from recognition to intervention in a safe environment with dedicated time to realistic, simulation sessions.
Simulation Education Review (eLearning Course)	This e-learning course has been designed to provide a review of simulation based education principles, including instructor responsibilities, creating an effective simulation session (from scenario design to implementation), and debriefing methods for all educators, instructors, faculty leads, and program leads involved in providing simulation education.
Simulation Educator Training Program	The simulation centre, in collaboration with the Centre for Faculty Development, offers a two-day immersive simulation training program for all health care professionals, educators, faculty, and instructors interested in simulation.
Simulation Elective Program	The Simulation Elective Program provides the opportunity for health care professionals to be immersed in the simulation environment to better understand the use of simulation for education, clinical training and research. The elective can be completed over the course of four weeks.

EXCELLENCE IN QUALITY

Quality improvement is at the heart of everything we do at St. Michael's. It enhances the way we deliver care and service to our patients across the hospital and keeps us focused in our daily work. Below are a couple examples of how quality and improvement in patient safety are embedded in all aspects of simulation.

Quality Improvement Technology Supported Education (QuITSE) Project

Blood product delivery in the operating room

Transfusion errors continue to exist despite guidelines and protocols being in place and were identified by the Quality of Care Committee (QCC) as an area of improvement.

In collaboration with the QCC, QuITSE committee, operating room team, blood bank and medical media, the simulation program successfully conducted a series of in-situ simulations in the operating room with over 50 members of interprofessional teams including: registered nurses, technical assistants, surgeons, anesthesiologists, respiratory therapists, porters, and blood bank technicians.

Simulation technology was used to identify gaps in non-technical skills such as, communication, situational awareness and, resource allocation, to better understand the team performance when initiating the process for ordering blood products for a patient.

Mock Intensive Care Unit Setup

The simulation program was involved in the process of designing the new intensive care unit (ICU) bed spaces for the St. Michael's 3.0 project (Peter Gilgan Patient Care Tower).

This was a collaborative project between the simulation program, ICU educators, ICU team members (registered nurses, respiratory therapists, physicians, and clinical assistants), biomedical engineering, carpentry, information technologists, and electricians. The session was part of a research project for St. Michael's 3.0, around human factors that should be taken into consideration when designing an ICU bed space. The teams of health care providers participated in sessions involving different room setups and different levels of stress. The events in the sessions ranged from daily basic care procedures to managing a cardiac arrest scenario.

As a result, the ICU design team was able to determine the final design for the ICU bed space for the Peter Gilgan Patient Care Tower.

Simulation Data Registry Project

This project, in conjunction with the Research Committee of the Society of Simulation in Healthcare will develop a process for archiving and standardizing data derived from simulation-based educational activities at various institutions throughout the United States, Canada, and Europe. This database will enhance the efficacy of the simulation methods, the efficiency of simulation research, and provide needed benchmarking information to enhance programmatic development.

ThinkFirst Injury Prevention Strategy for Youth (TIPSY)

The TIPSY program is an injury prevention program that is offered to high school students in the Greater Toronto Area. The program is taught by an inter-professional team of nurses, physicians, as well as representatives from Toronto Police Services, Mothers Against Drunk Driving (MADD) and a Voice of Injury Prevention (VIP). The VIP is a trauma survivor who has sustained a brain or spinal cord injury and recounts first-hand the events leading up to his/her injury, its consequences and lasting effects. The focus is on helping youth understand how inexperience, lack of restraint use, drinking/drugging/texting and driving can result in tragedy on the roadways.

Jackson Surgical Spinal Table (JSST) Project

The simulation program, under the direction of the Perioperative Services Local Quality Council (PS LQCC), and in collaboration with the operating room nurse educator, developed and implemented simulation scenarios to help health care providers learn the Jackson Surgical Spinal Table. Scenarios included sequencing, reinforcing team responsibility and role clarity. This project was developed in response to two separate incidences reported to the PS LQCC where a staff member was injured while using the JSST.

Transfer of Accountability Centralized Education

Transport of accountability, the process by which patient information is shared between health care providers during shift changed, was identified as an area for practice improvement. This project has been a corporate initiative since 2012.

The simulation program, in collaboration with the nursing professional practice at St. Michael's, developed a simulation training program for all new nursing hires.

Crisis Resources for Emergency Workers (CREW) and Trauma Non-Technical (TNT) Training

These interprofessional team based training programs focus on the non-technical skills and components of a crisis situation. Objectives include increasing the learners' knowledge of situation awareness, communication, problem solving, resource allocation, role clarity, and leadership to improve clinical practice and positively impact patient safety and quality of care.

The Surviving Opioid Overdose with Naloxone (SOON) Project

The SOON project is a joint initiative between the Dalla Lana School of Public Health and St. Michael's Hospital.

This past year, St. Michael's led the research, designed to prevent fatalities from opioid overdose. Over the last decade, community addictions organizations and harm reduction clinics worldwide have initiated programs to distribute naloxone (an opioid reversal agent) to at-risk drug users, and to train users to administer the drug in emergency overdose situations. Given that most opioid-related fatalities are witnessed by friends or family, basic life support training and opioid reversal agents have the potential to save lives.

TERM CHAIR IN TECHNOLOGY-SUPPORTED EDUCATION

INSPIRE 2018

Technology is transforming health care education to improve patient outcomes.

Technology is revolutionizing our world at an extraordinary pace, and nowhere more so than in medical education. Canada's first Chair in Technology-supported Education will drive the adoption of technology to improve patient care and sustain lifelong learning.

A shining example of technology-supported education is in the field of simulation. The Allan Waters Family Simulation Centre at St. Michael's is a state-of-the-art learning space with expertise in engaging learners across professions to improve both individual technical skills and teamwork skills. Just like any other high-stakes profession– think of aviation, aerospace or the military – we now use simulation methods to effectively train inter-professional teams. Research has demonstrated that health care professionals and teams who receive specific simulation training before clinical care improve patient outcomes, compared with their traditionally trained counterparts. The scope of the simulation centre has expanded to investigate and better understand how health care teams work together in the clinical environment.

First we use this technology to understand the gaps in knowledge or the hazards of the actual environment. Once a hazard or a gap is identified, we seek to correct it efficiently so that patient outcomes and delivery of care will improve. This requires significant expertise in communication, educational methodology and knowledge in human factors. Whether it's via a mobile application, an interactive course offered via e-learning, telemedicine or just-in-time augmented education, assessment and evaluation of these interventions is key.

A Chair in Technology-supported Education will enable us to attract and retain a leading scientist and educator who can bring together our local experts and lead our technology-based programs with exemplary scholarship and best practices. The chair will support international research Fellows visiting St. Michael's who will study the design and delivery of innovative educational programs, inspiring learning around the world. We are seeking to raise $1 million to create a term chair, expendable over five years.

As health professions' training programs move toward competency-based models of education across the globe, there is an increasing need for robust high-quality, efficient, and cost-effective simulation-based training and assessment programs. The Chair in Technology-Supported Education role will support the hospital's corporate goals through collaborative research, thoughtful innovation, and a commitment to quality improvement in health care.

Collaborative Research

For St. Michael's to be successful, a core part of our mandate moving forward will be to harness the power of the collective research capacity, methodological, and theoretical expertise that resides at St. Michael's, the Wilson Centre, and all of the partner clinical departments. By encouraging connections and setting the stage for collaboration, St. Michael's will be the place where researchers work together on projects that could not have been conceived or implemented by any one individual. The Chair in Technology-Supported Education will encourage the development of monthly research rounds, a central database that tracks and advertises all ongoing projects to education team members, as well as a research skills training program. By clarifying and centralizing ongoing activities and nurturing the development of scholars in simulation science, the goal would be to invest resources into producing a group of competent project leads and project collaborators who will be competitive for external grant funding and scholarly dissemination of their research.

Thoughtful Innovation

For years, theory-oriented researchers have recommended that educators use theory and evidence to design their educational innovations, rather than their intuition. Yet, our communities continue to exist in silos because it's challenging to accomplish meaningful integration of the ideals of the two groups. There is a need to build a shared vision for how the simulation centre (and other innovative units) will stand out as leaders in educational innovations that are firmly grounded in theory. That goal is within reach at St. Michael's, based on the 2015-18 Education Strategic Plan and all of the key stakeholders who are contributing to its realization.

In addition to educational innovation, St. Michael's is well positioned to serve as a test-bed for technological innovation – both in terms of the simulators/simulations used for education and in the testing of equipment and technologies destined for the clinical context. The simulation centre has the potential to be used as a laboratory for experimenting with new technologies, conducting human factors studies, and educating health care professionals on how to use them to improve patient care. "Innovation Rounds" with speakers invited from non-traditional contexts such as MBA, engineering, and biomedical communications programs would help our faculty think outside the box to produce groundbreaking innovations. Creating the opportunity for these kinds of connections would mean that no researcher, educator, or innovator would be expected to tackle the challenging middle ground between theory and application alone – the simulation centre would act as a hub for the conceptualization, evaluation, and implementation of innovation.

Improving Quality of Health care

Integrating simulation-based training and assessment activities into the quality improvement cycles at our health care institutions will remain a priority. That integration simultaneously represents the biggest opportunity and challenge facing simulation centres globally.

SCHOLARSHIP IN EDUCATION

Grants

- Trauma Resuscitation Using in-Situ simulation Team training (TRUST study): A novel approach to safety threat identification and high-performance team training. Petrosniak A, Hicks C, Campbell D. SIM-one Simulation 2014 SIM-one/IDEAS/CPSI Simulation for Safety & Quality Improvement Program, 2014-2015
- Learning in place to support aging in place: a virtual home-based homecare curriculum. Woods N, Ng S, Campbell D. SIM-one Simulation- Based Continuing Interprofessional Development Program in At-Home Care of Seniors, 2014-2015. $99,415.26 CAD
- Optimizing end-tidal CO2 (ETCO2) use for in-hospital cardiac arrests using a novel inter professional simulation training program and increased ETCO2 availability. Wong N, Chandra D. SMHA innovation fund, 2014-2015.
- Simulation-based Team-Leadership training for Neonatal Resuscitation: Is learning by Observation as effective as learning by Participation? Kalaniti K, Campbell D. Canadian Pediatric Neonatal Resuscitation Program (NRP) Young Investigator's Research Award, 2013-2014.
- Development of a Newborn Lung Simulation Model as an educational tool for mechanical ventilation for residents and fellows. Mukerji A, Belik J, Campbell D. Education Development Fund, University of Toronto, 2013-2014.
- NRP Prompt a mobile web application to improve quality of neonatal resuscitation. Chan N , Mistry N, Campbell D. Canadian Pediatric Neonatal Resuscitation Program (NRP) Young Investigator's Research Award, 2013-2014
- Simulation-based interprofessional training – the effect of mental practice on team performance. St. Michael's Hospital. Innovation Fund. PI: Hayter, M. Collaborator(s): Ahmed N, Nathens A, Barrett L, Grantcharov T. 137,782 CAD.
- Crisis Resources for Emergency Workers (C.R.E.W.): A Simulation-Based Inter-Professional Team Training Initiative. Toronto Academic Health Sciences Network and the Michener Institute for Applied Health Science. PI: Denny, CJ. Collaborator(s): Bandiera G, Etchells E, Hicks C, LeBlanc VR, Ramagnano S. 86,020 CAD.
- Trauma Non-Technical Training: Developing a Simulation-Based Team Training Course for Trauma Resuscitation. St. Michael's Hospital. Collaborator(s): Ahmed N, Bawazeer M, Hayter M, Nathens A. 1,250 CAD.
- Developing quantitative tools to evaluate endoscopic performance using a high-fidelity simulator. Department of Medicine, University of Toronto. Division of Gastroenterology Research in Education Grant. PI: Cooper, Mary Anne. Collaborator(s): Grover SC, Carnahan H, Yong E, Tinmouth J, Walsh CM. 140,000 CAD.
- Implementation of Multi-disciplinary Simulation based Team Training: Improving Management of Surgical Crisis Situations. Ontario Innovation Funds Provincial Oversight Committee. SMHA Innovation Funds. 9,592 CAD.

Articles

- Kalaniti K, Campbell DM. Simulation-based medical education: time for a pedagogical shift. Indian Journal of Pediatrics. 2015:52:41-45. SRA
- Foell K, Finelli A, Yasufuku K, Bernardini M, Waddell TK, Pace KT, Honey RJ, Lee JY. Robotic Surgery Basic Skills Training – Evaluation of a Pilot Multi-disciplinary Simulation based Curriculum. Canadian Urological Association Journal. 2013

- Lee JY, Mucksavage P, Canales C, McDougall EM, Lin S. High-Fidelity Simulation-based Team Training in Urology: A Preliminary Interdisciplinary Study of Technical and Non-technical Skills in Laparoscopic Complications Management. Journal of Urology. J Urol 2012 Apr;187(4):1385-1391
- Doumouras A, Ahmed N, Nathens A, Hicks C, Trauma Non-Technical Training (TNT-2): The development, piloting and multi-level assessment of a simulation-based, inter-professional curriculum for team-based trauma resuscitation (CJS-0200-13-OA) - CJS - accepted
- Doumouras A, Keshet I, Nathens AB, Hicks C, Ahmed N, A crisis of faith? A review of simulation in teaching team-based, crisis management skills to surgical trainees. J Surg Educ. 2012 May-Jun;69(3) 274-81. Epub Jan 4 2012
- Ashamalla S, Grantcharov T, Ahmed N, Smith A. A simulation curriculum to teach advanced laparoscopic skills to senior surgical residents. CJS submitted.
- Zevin B, Bonrath E, Ahmed N, Aggrawal R, Grantcharov T, The Development, Feasibility, Validity and Reliability of a Scale for Objective Assessment of Operative Performance in Laparoscopic Gastric Bypass Surgery. Journal of the American College of Surgeons 2013 May 5(216) p 955-959. Epub 2010 Oct
- Hicks C, Kiss A, Bandiera G, Denny C. Crisis Resources for Emergency Workers (CREW II): Results from a Pilot Study and Simulation-Based Crisis Resource Management Curriculum for Emergency Medicine Residents. Canadian Journal of Emergency Medicine. 2012 Nov 28;14(6):354-62. Impact Factor 1.184

Book Chapters

- Neonatal Simulation (invited) Campbell DM, Manhas D, Johnston L in: "The Comprehensive Textbook of Healthcare Simulation: Pediatric Edition", Springer Publishing 2015 eds. Cheng A & Grant V.
- Hicks C. History of Crisis Resource Management. In: Simulated Trauma and Resuscitation Team Training (STARTT). Stringer Publishing Inc.; 2012. Gillman L, Widder S et al. Simulated Trauma Assessment and Resuscitation Training (STAART), Stringer Publishing Inc. In Press.
- Lee JY, McDougall EM. Surgical Simulation Chapter #1 - Surgical Simulation: An Overview.

Abstracts

- Campbell DM, Boost L, Contreras M, Houston P. Use of Simulation to Detect Errors In Perioperative Blood Transfusion. International Medical Simulation in Healthcare (IMSH). Innovation Showcase Selection. New Orleans, LA. January 12, 2015. International
- Allan KS, Wong N, Aves T, Dorian P. The Benefits of a Simplified Method for CPR Training of Medical Professionals. A Randomized Controlled Study. ESICM July 2013. Poster presentation
- Wong N, Allan K, Aves T, Dorian P. Use of High-Fidelity Simulation Training to Improve Delivery of High Quality BLS by First Responders. ESICM July 2013. Poster presentation.
- Allan K, Wong N, Aves T, Dorian P. The benefits of a simplified method for CPR training for medical professionals: a randomized controlled study. Circulation 120(18) suppl: Abs. P71, 2009.
- Walsh CM, Cooper MA, Yong E, Tinmouth J, Carnahan H, Grover SC, Ritvo P. A qualitative assessment of the standardized University of Toronto gastrointestinal endoscopy curriculum. 2011 Canadian Conference on Medical Education, Toronto, Canada. (Abstract P-090). Coauthor or Collaborator.
- Walsh CM, Ling SC, Khanna N, Cooper MA, Grover SC, May G, Walters T, Rabeneck L, Reznick R, Carnahan H. Development of an objective skill assessment tool for colonoscopy: A Delphi approach. 2012 Gastrointestinal Research Topics Symposium, Montreal, Canada. (Abstract A35).