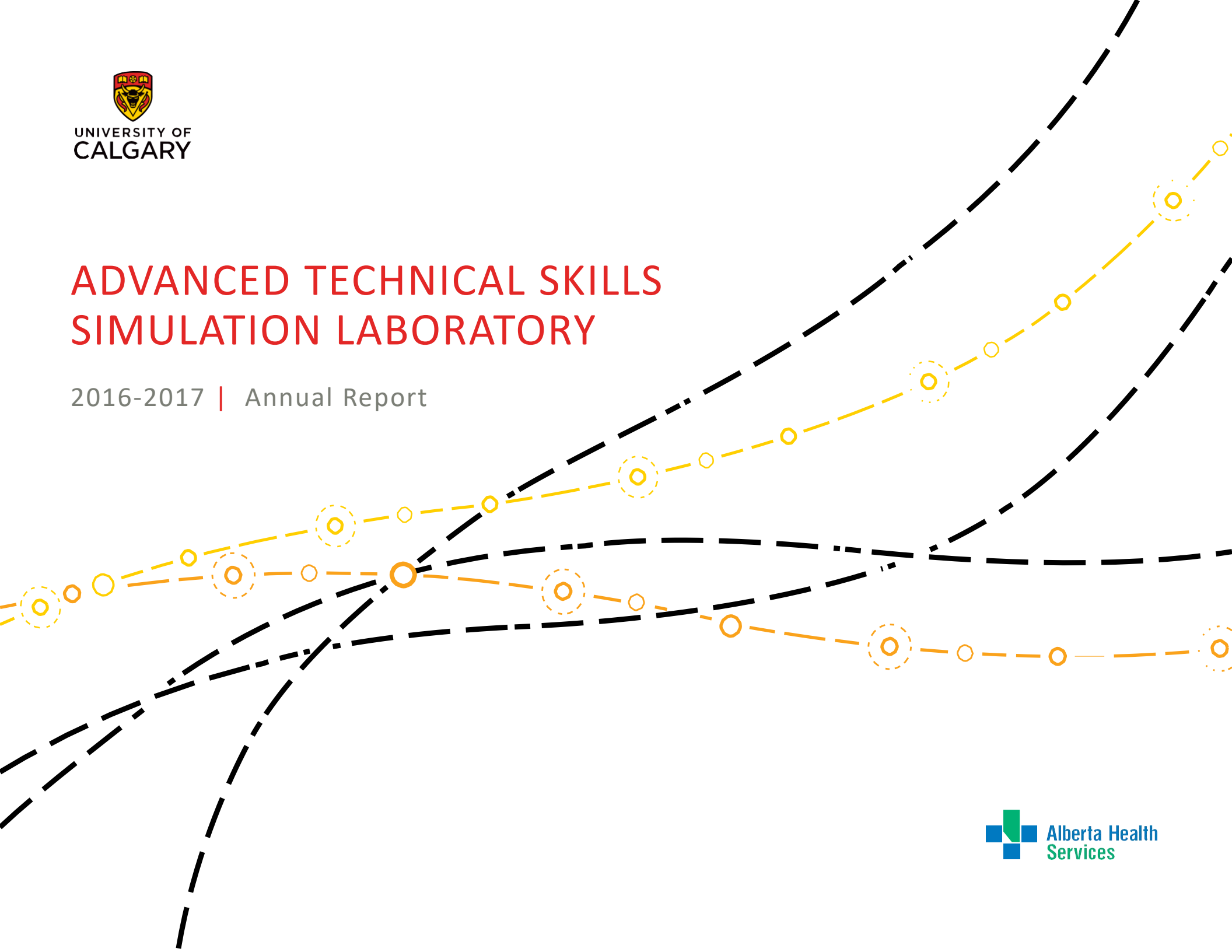
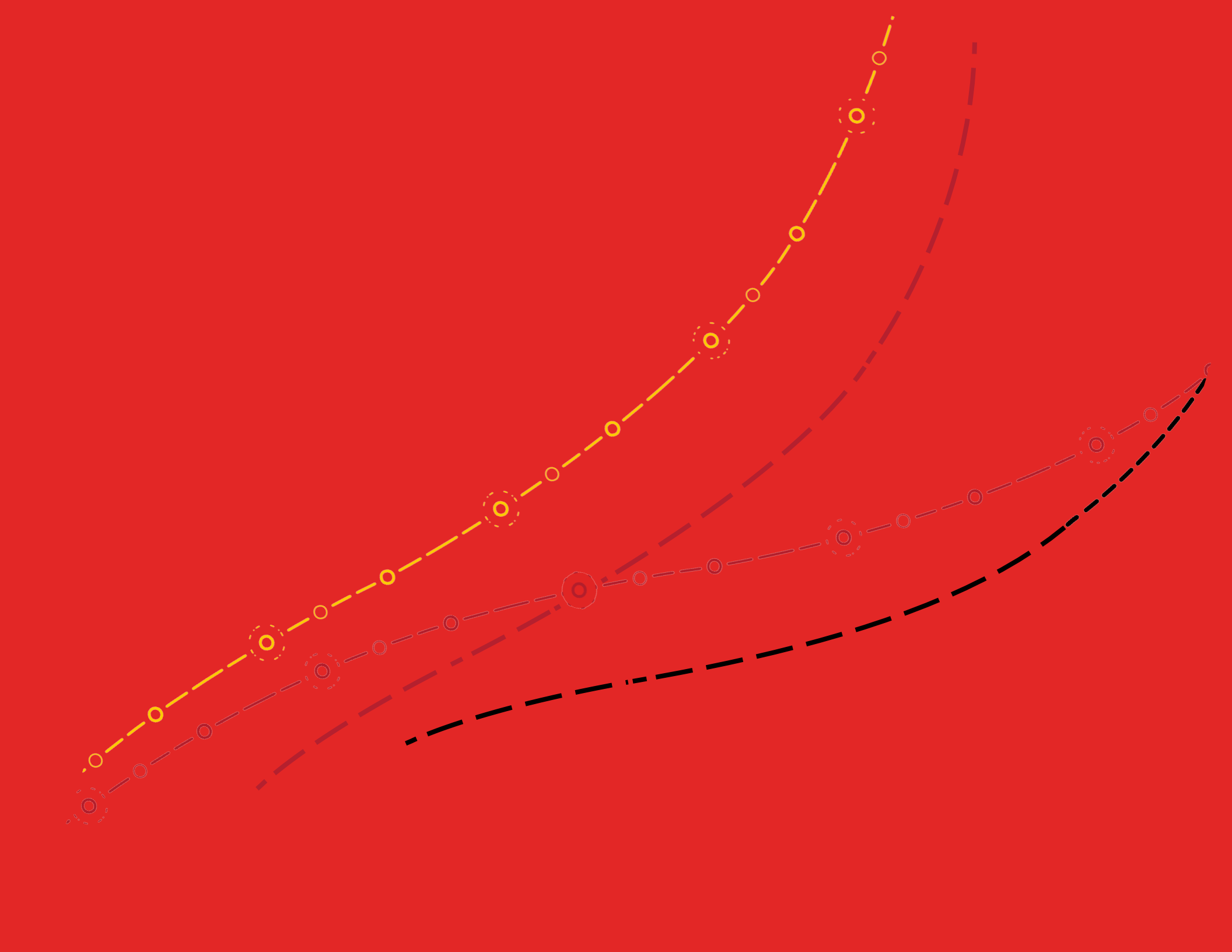
UNIVERSITY OF CALGARY

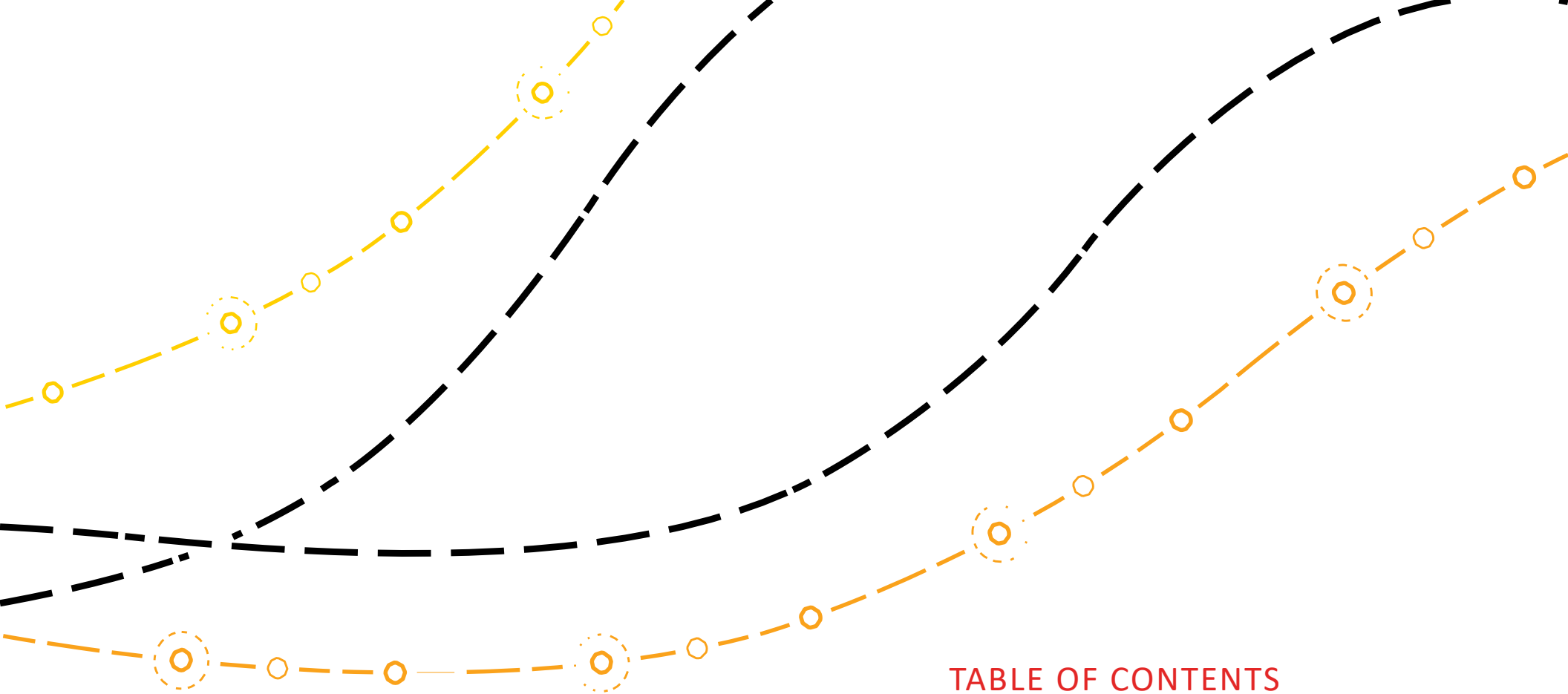
ADVANCED TECHNICAL SKILLS SIMULATION LABORATORY

2016-2017 | Annual Report



Alberta Health Services





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ABOUT THE ATSSL

The *Advanced Technical Skills Simulation Laboratory (ATSSL)* has been open for 3 years and served over 20,000 learning encounters during the 2016-17 year. The ATSSL provides a full complement of simulation modalities from human and animal cadaveric tissue to theater-based simulation.

ATSSL is dually supported by the Cumming School of Medicine (CSM), University of Calgary (UCalgary) and Alberta Health Services (AHS). This collaboration allows for ATSSL to deliver simulation based medical education (SBME) to collectively accommodate broad and diverse groups of learners, including medical students, postgraduate residents and fellows, physician specialists, surgical specialists and family doctors, as well as nurses and allied health professionals.

The 20,000 square foot, state-of-the-art facility, can accommodate small and large groups of learners simultaneously, in parallel streams.

The ATSSL aspires to a healthier future by providing an innovative and safe environment for healthcare professionals to learn and master skills. The ATSSL, through simulation, strives to capture knowledge, attitudes, skills and behavior required to enhance and support patient safety.

ATSSL strives to adhere to best practice in simulation based medical education to develop needs assessments, goals and objectives, design scenarios, and build evaluation and assessment practices. ATSSL focuses on skills and knowledge acquisition, interprofessional training and team work, and a better understanding of latent patient safety threats in our environment.

Furthermore, simulation-based training can produce more effective, confident and safe medical and surgical professionals. This will have an immediate impact in the short- and long-term care of patients within our community.

ACKNOWLEDGMENTS

In 2012, a project charter was created by AHS and UCalgary for the establishment of the ATSSL.

The ATSSL would not have been possible without the contributions of the following individuals.

Executive Steering Committee:

Jocelyn Lockyer PhD, Senior Associate Dean Education, CSM

Guy Levy, Executive Director, CSM

Dr Marcia Clark, Medical Director, ATSSL, CSM

Dan Huffman, Provincial Director Provincial Simulation Program, AHS

Laurel Taylor PhD, Senior Provincial Director, Performance Improvement, AHS

Tanya Platt, Manager eSIM South, AHS

Pamela Fawcett, Senior Director Development, CSM

Jennifer Ocloo, Manager, Business Advisory Services, AHS

George Mulvey, Manager, ATSSL, CSM

EXECUTIVE SUMMARY

The ATSSL is a unique space and partnership between AHS eSIM Provincial Simulation Program and the CSM, UCalgary. Both organizations are committed to providing an innovative interdisciplinary learning environment with improvement in patient safety and quality of care as the goal. Special acknowledgements have been made in prior reports to specific individuals in these organizations that contributed significantly in the establishment of the ATSSL.

The ATSSL facilities are in the Health Research Innovation Centre and the Health Science Centre on the UCalgary, Foothills Campus. It consists of the Surgical Skills Simulation Laboratory, completed in 2014, and Clinical Skills Simulation Laboratory, completed in 2015.

The ATSSL activities are managed and organized by a Medical Director, Operations Manager, Coordinator, Simulation Consultants and Technicians. In 2016-17, the ATSSL welcomed 19532 users during 571 educational sessions. The Surgical Skills Simulation Laboratory (10,348 users, 331 sessions) and the Clinical Skills Simulation Laboratory (9184 users, 240 sessions) showed a 69% and 15% increase, respectively, in sessions booked. The learning groups were predominantly medical students and residents, but also included physicians, allied health care providers, and other university, college and high school students.

ATSSL's commitment to be in the forefront of simulation through innovation, excellence, collaboration, learning and integrity is reinforced by the strength of our relationships with our users. ATSSL values the provision of excellence in service in all areas of the simulation experience. The overall goal is to provide a high standard of simulation-based education both formative and summative, with secondary objectives of expanding research and development in the field of simulation by allowing the study, analysis and review/debrief of active learning of skills teamwork or cognitive load training.

VISION, MISSION, AND VALUES

Vision

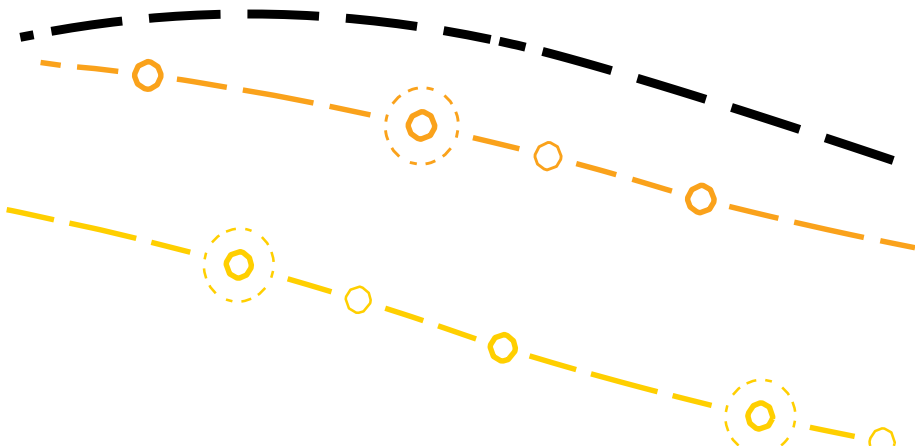
To be the forefront of simulation in medical education.

Values

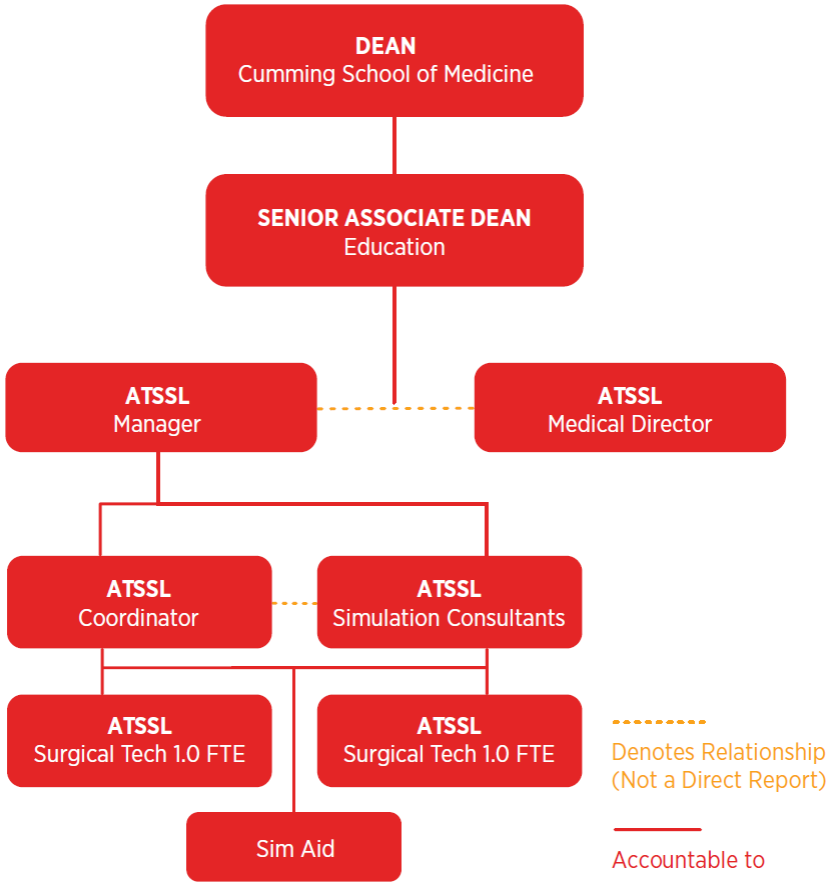
Innovation, Excellence, Collaboration, Learning, Integrity.

Mission

The ATSSL aspires to a healthier future by providing an innovative and safe environment for healthcare professionals to learn and master skills. The ATSSL, through simulation, strives to capture knowledge, attitudes, skills and behaviour required to enhance and support patient safety.



ORGANIZATIONAL STRUCTURE AND GOVERNANCE



GOVERNANCE AND OPERATIONS

The ATSSL is co-led by a Medical Director, Dr Marcia Clark, who holds a UCalgary clinical faculty appointment and is a member of the AHS medical staff, and an Administrative Director, Provincial Director of eSIM Simulation, Dan Huffman. These positions report to the Dean's designate (CSM) and the VP Quality and Chief Medical Officer (AHS), respectively.

The ATSSL Operations Manager, George Mulvey, is responsible for the daily operations of the facility. This position reports to the CSM Senior Associate Dean – Education, Dr. Jocelyn Lockyer, and is also accountable to the Provincial Director of eSIM Simulation, Dan Huffman.

The ATSSL Executive Steering Committee is jointly accountable to AHS eSIM and CSM, UCalgary, and is responsible for oversight of the ATSSL. These responsibilities include all strategic, operational and financial plans. The full terms of reference including roles and responsibilities of the committee are provided in detail at: www.ucalgary.ca/atssl/about/governance

ATSSL TEAM

Dr Marcia Clark

Marcia joined the ATSSL as Medical Director in November 2015. She is an Orthopaedic Surgeon and Clinical Associate Professor working at the Bone and Joint Clinic at the South Health Campus. She is also the Vice-Chair of Surgical Foundations at the Royal College of Physicians and Surgeons of Canada (RCPSC) helping to frame and implement Competency Based Medical Education (CBME) in Surgery across Canada. Marcia travels with the RCPSC extensively to deliver medical education topic to international faculty. Marcia also has a sport medicine interest providing medical care to several athletic teams including Calgary Wolfpack Rugby, UCalgary Dinos, Formula One Car Racing (Montreal) and the Canadian Alpine Ski Team.

George Mulvey

George has been the Operations Manager of the ATSSL since it opened in 2014. He completed his Professional Business Management Certificate in 2016 at the UCalgary and has attended the Northern Alberta Institute of Technology Biological Sciences Program, Laboratory and Research Option Diploma and the University of Alberta, Bachelor of Science Program. Prior to joining the ATSSL, George worked at the University of Alberta and then the UCalgary as a bacteriologist researcher managing all aspects of the laboratory's operations including research trust accounts from the Federal and Provincial Government and industry as well as directing Graduate Students and Technicians on numerous projects while collaborating with researchers and research groups from across Canada and the United States.

ATSSL TEAM

Heather Hill

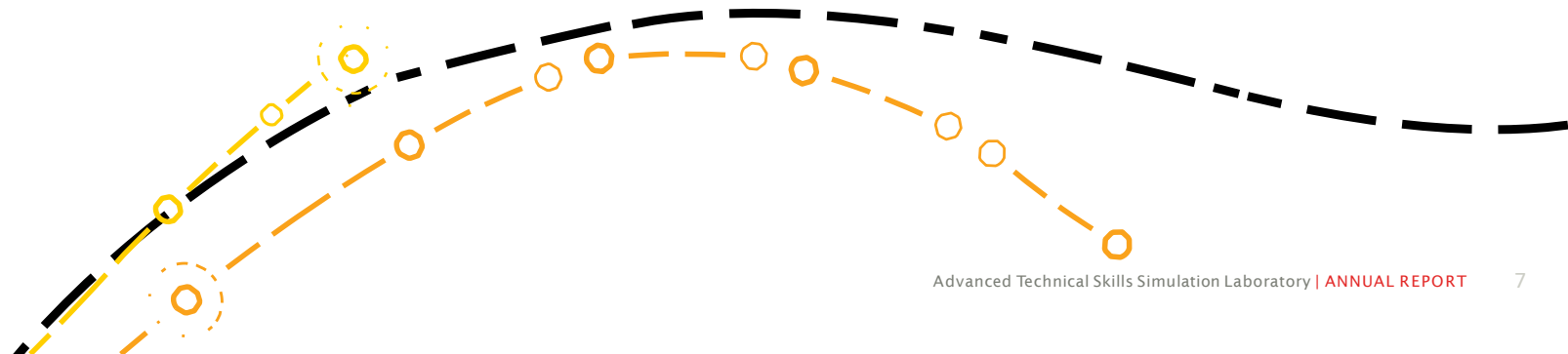
Heather joined the ATSSL prior to hosting its first event in early 2014. Heather completed an Honours, Bachelors of Science in Applied Biomolecular Science from Lakehead University in 2007. Previously, Heather managed the Tissue Processing Program at RegenMed, a Bone and Tissue Bank that produces surgical grafts for implantation from donated human tissue. Heather's passion for the medical sciences and simulation is apparent to any one that meets her. Heather has visited numerous other simulation centres in Canada returning with a breadth of knowledge that she incorporates in all labs she coordinates. In addition to coordinating and organizing all lab events in the Clinical Skills and Surgical Skills, Heather is always keen to look at other ways to collaborate with users on best models, space utilization or act as facilitator for large events that extend out of the ATSSL.

Irina Charania

Irina graduated from a Collaborative Program in Life Sciences and Respiratory Therapy in 2006 and began her career as a Registered Respiratory Therapist at the Foothills Medical Centre. She completed her BScH Degree (Life Sciences) at Queen's University in 2009 while practicing Respiratory Therapy at Kingston General Hospital. During her RT career, Irina was involved in the development and implementation of QI initiatives, clinical research activities, assumed a Staff Educator role, and began training in simulation-based education. Irina joined the AHS eSIM South Simulation Team in 2013 where she applied her prior training to the development of a simulation-based program for developing the Collaborative Care Competencies of AHS Interprofessional Preceptors and Mentors. She brought this expertise to the ATSSL when she joined the team as a Simulation Consultant in March 2015.

Michèle Cowan

Michèle completed a Bachelors in Anatomy (1994) and Masters in Biomedical Engineering (2000) from the University of Saskatchewan and a Masters in Educational Technology (2015) from UCalgary. Michèle worked in the Office of Postgraduate Medical Education (PGME) at the UCalgary for 6 years, prior to joining the ATSSL team in October 2016. Her research interests include computer-assisted feedback training, integration of electronic portfolios, fatigue risk management and virtual patient case development. Michèle has collaborated on national and international educational projects and facilitated the development of quality medical referral education workshops, modified objective-based clinical examinations and of a successful 2015 PGME accreditation. Additionally, she has led projects that leveraged technology to facilitate communication and data management to optimize processes.



ATSSL TEAM

Stephanie Jaunin

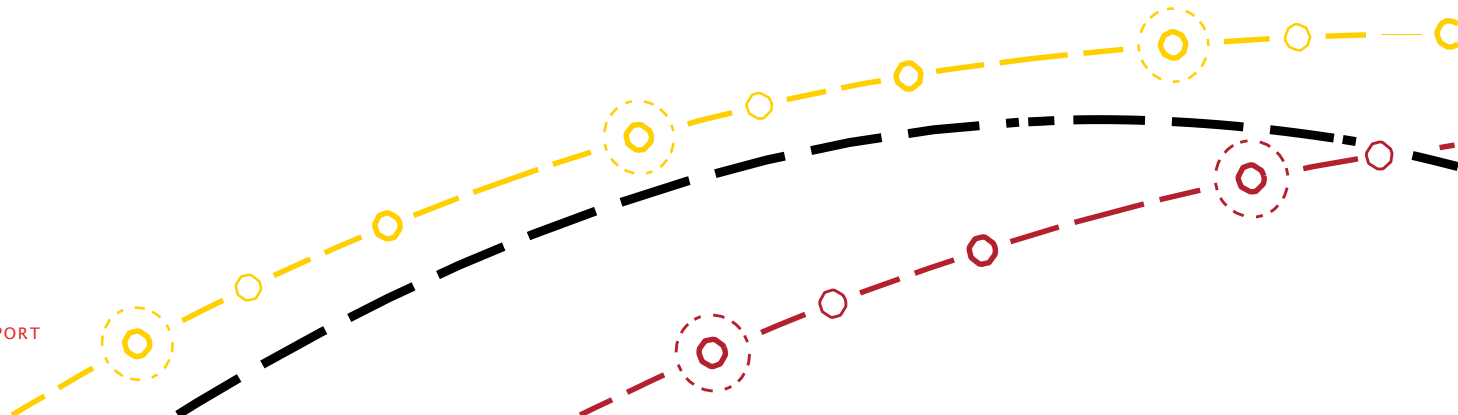
Stephanie joined the ATSSL team as a Surgical Technician in April 2014. Stephanie received a certificate in Sterile Process and Distribution from SAIT and had previously worked as a Sterile Technician with AHS in the Operating Room Department at South Health Campus. Her extensive experience in the Department of Medical Device Reprocessing and operating room has proven to be an invaluable asset to the ATSSL team. Stephanie is dedicated to providing clients with outstanding service and support and welcomes the opportunity to collaborate and assist new users in developing and creating new simulation models, often hybridizing cadaveric animal tissues with dry models and developing or improving current models.

Vladimir Vinluan

Vladimir has been with the University of Calgary for almost six years, starting as a Research Assistant then joining the ATSSL in June 2014. He is a graduate of Medicine (1990 Philippines), practiced Medicine in the Philippines for more than 15 years, and completed the Health, Safety and Environment Certificate at the UCalgary in 2016. Vlad brings medical knowledge and clinical experience to the simulation laboratory, and is experienced working with and preparing the high fidelity manikins and task trainers in the Clinical Simulation Lab for a broad spectrum of users.

Darren Steidl

Darren has been with AHS for 14 years. Originally employed as a Biomedical Equipment Technologist for the Department of Clinical Engineering from 2003 – 2014, during this time he supported a variety of medical devices such as Ultrasound Systems, Neurophysiology equipment, Clinical IT Systems, etc. He transitioned to the role of Simulation Technical Consultant with the ATSSL and eSIM in 2014. He provides direct support and expert counsel on all aspects of technology and programming components or interfaces used in support of simulation education service delivery.



FACILITIES

The ATSSL facilities are divided into two locations: Surgical Skills Simulation Laboratory in the Health Research Innovation Centre and Clinical Skills Simulation Laboratory in the Health Sciences Centre, both within the Cumming School of Medicine, UCalgary.

Surgical Skills Simulation Lab

The Surgical Skills Simulation Laboratory is a state-of-the-art facility where a variety of procedural skills such as laparoscopy, arthroscopy, endoscopy and microsurgery are practiced by residents in accredited surgical residency programs. In addition to surgical residents, a diverse group of users including staff and residents from Family Medicine, Emergency Medicine, Critical Care, Alberta International Medical Graduate (AIMG) and Physical Medicine and Rehabilitation training programs, develop skills required for their respective disciplines. The space includes a total of 20 simulated operating room stations fully equipped with scrub sinks, surgical beds and tables, overhead OR lighting, dual LED monitors and ceiling supply units. Four of the stations are specially outfitted with in-light cameras that allow real-time imaging to be displayed throughout the lab and classrooms.

An integrated system of pan-tilt-zoom cameras offers the ability to video record laboratory sessions. Video recording provides instructors and learners the opportunity to review and discuss procedures as well as monitor the progress of trainees from a distance. The ability to record these sessions also allows faculty to develop research programs designed to evaluate new techniques, new equipment and new teaching methods. Trainees are also able to develop their own portfolio of work in the form of performance videos of simulated surgical procedures.

The lab is designed to be multifunctional and offers a variety of configurations to accommodate different group sizes. The area can be used as one large space or divided into two or four smaller spaces allowing for multiple education sessions to occur at once.

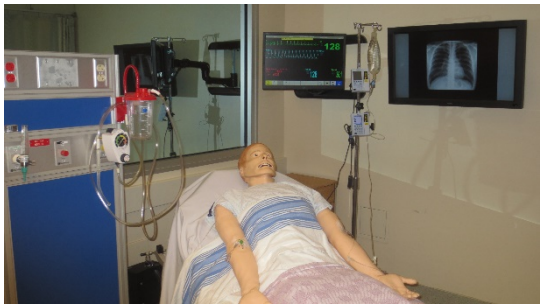
Additionally, the ATSSL is focused on user safety and is equipped with a fully functional reprocessing area to clean and sterilize instruments on-site.

FACILITIES

Clinical Skills Simulation Lab

The Clinical Skills Simulation Laboratory is an innovative multidisciplinary medical simulation facility where learners use simulators to enhance technical skills, patient safety and learner safety. Simulators are tools that include a variety of task trainers, computerized manikins, and standardized patients. Learners utilize a wide selection of specific task trainers such as airway simulators, central line simulators and intravenous arms. The lab is well equipped and supported with three simulation suites and 8 modular classroom pods to facilitate learning of procedural skills and interprofessional training. The lab has the capacity to accommodate 160 learners at any one time allowing for numerous groups to work independently within functional spaces permitting private debriefing or conference-like presentations.

Future development of these facilities will enhance our abilities to optimize the realism of our simulated clinical settings. ATSSL has prioritized the acquisition for a simulation video capture system with expandable servers elevating the centre to standards of other Canadian simulation centres and aligning with the Royal College of Physicians and Surgeons of Canada (RCPSC) Competency by Design.



Classrooms

The ATSSL has two dedicated classrooms in the Surgical Skills Simulation Laboratory area of the ATSSL. Capable of accommodating up to 30 learners, the classrooms can be used for lectures, debriefings, symposiums, conferences, and executive meetings.

Each room features:

- wireless internet access
- lecture podium with VGA and HDMI laptop connections
- LCD projector & in-ceiling speakers
- videoconference capability
- remote viewing of surgical skills areas

EDUCATION

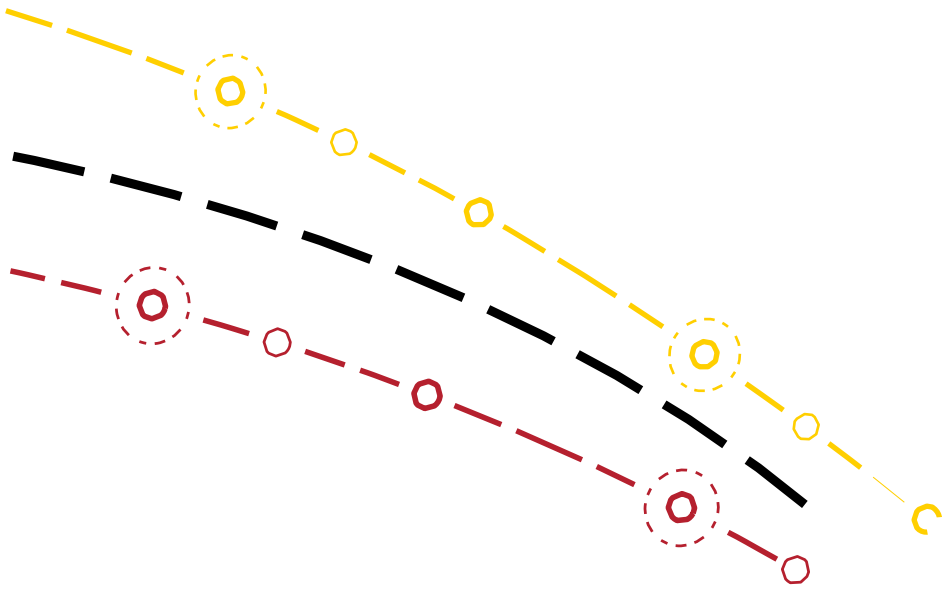
In 2016-17, the ATSSL hosted 19,532 users during 571 educational sessions, a 40% increase over the previous year. The users are predominantly medical students and residents, with other learner groups including physicians, allied health care providers, other university, college and high school students. The numbers of current healthcare practitioners accessing the lab for continuing professional development grew steadily as more programs became aware of the dedicated ATSSL's team commitment and focus on the delivery of a quality simulation event. ATSSL functions to support existing curricula through the provision of numerous simulated procedural skills techniques and recommendations to improve educational strategies. ATSSL further provides a robust educational experience where staff facilitates the custom design of structured simulations, while optimizing resources, accommodating for appropriate skill acquisition, and goals and objectives of the program. Continuous improvement of the learner experience demonstrates ATSSL's dedication to high quality, operational services and planning for future sessions. The sustainability of this quality relies on industry sponsored sessions to physicians for professional development and the learning of new techniques.

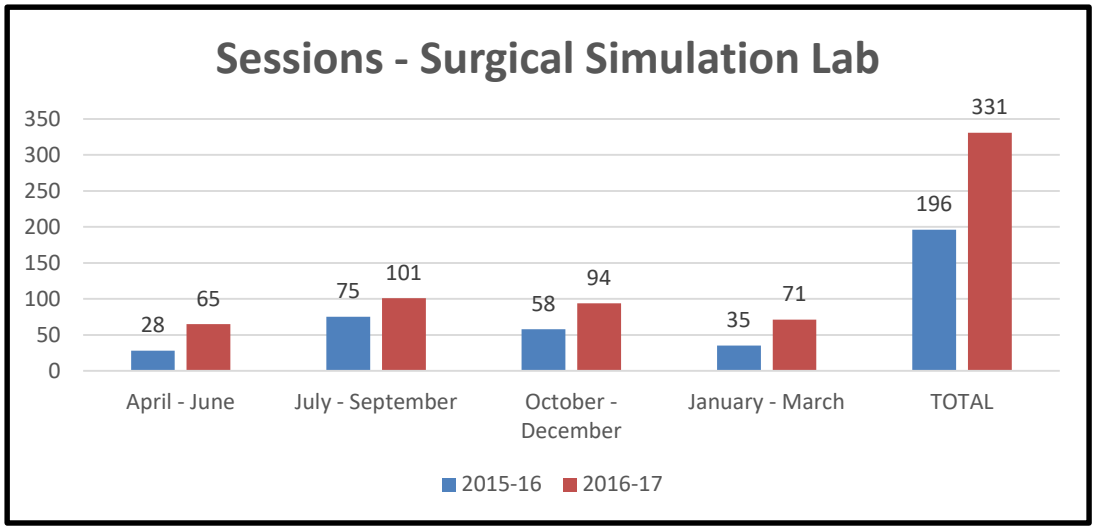
EDUCATION

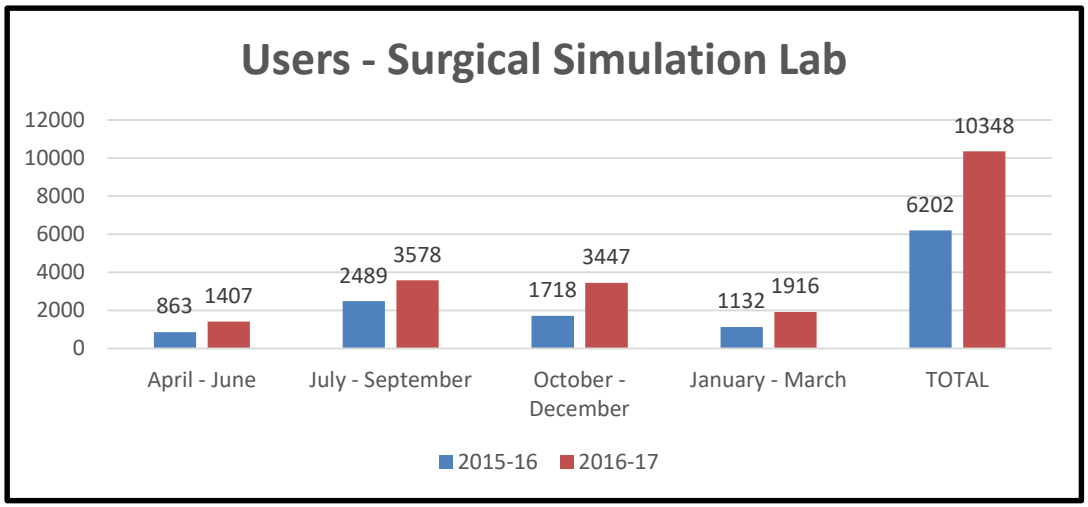
Surgical Skills Simulation Lab

There were 331 educational sessions in 2016-17 involving 10,348 users including physicians, residents, medical students, Bachelor of Health Sciences students (predominately for Anatomy courses and review), registered nurses and registered respiratory therapists. Lab usage peaks in the fall following the start of the academic years in July for UME and PGME.

The Surgical Skills Simulation Laboratory hosted several industry sponsored events that included learners from the Calgary region and across Canada. These include Zimmer Total Knee and Ankle Course, Medtronic Spine Course, Smith & Nephew Shoulder Arthroscopy Course, Ostek Shoulder Arthroplasty Course and MedQuest Clover Staple Surgical Technique Course.





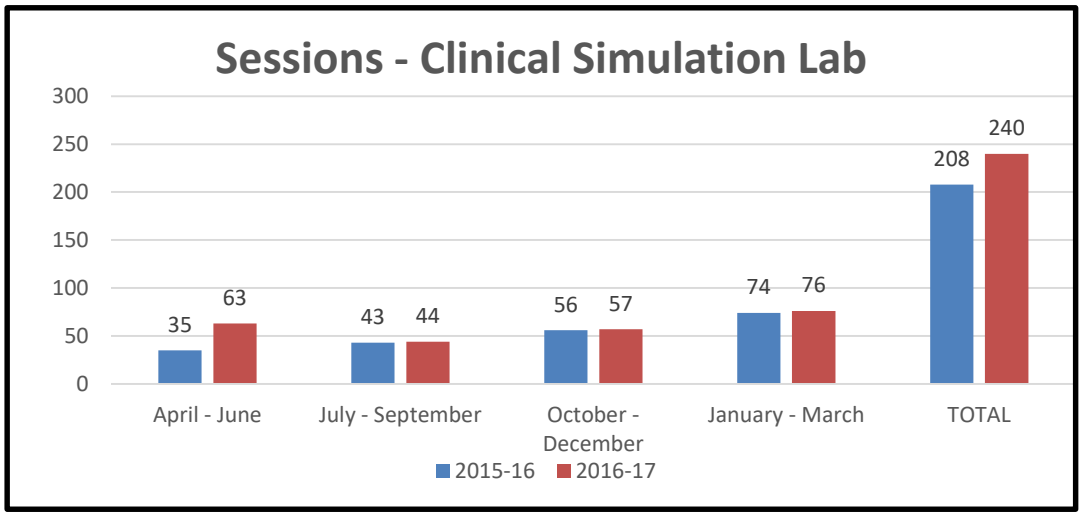


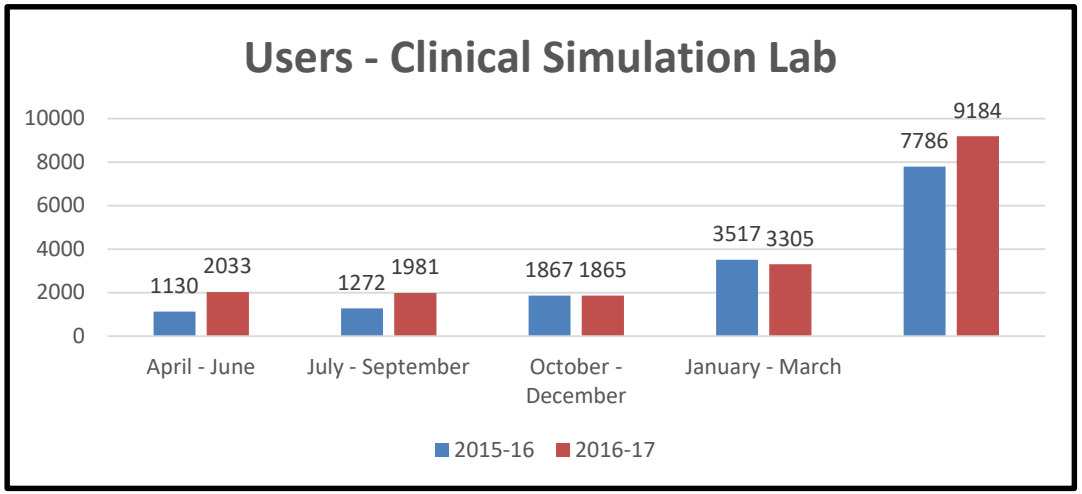
EDUCATION

Clinical Skills Simulation Lab

There were 240 educational sessions involving 9184 users in 2016-17. Usage of the Clinical Skills Simulation Laboratory increased steadily over the four quarters. Peaks in usage for UME and PGME trainees coincide with the academic calendars of curricular needs of the different training programs.

UME students attended 108 skill training or simulation sessions in the Clinical Skills Simulation Laboratory, and PGME trainees (medical residents/AHS employees) attended 71 separate sessions. High school students attended two Aboriginal Health Mini-Med school sessions. Healthcare providers such as nurses, attending physicians and allied health professionals participated in 58 continuing professional development (CPD) sessions. Fifteen of these CPD sessions were arranged by external users, including the Trauma Association of Canada and the Advanced Trauma Life Support program, and the Health Quality Council of Canada.





FINANCIAL STATEMENT

The ATSSL is jointly and equally funded by AHS and the UCalgary. Annual operating funds of $1m are provided for staffing, equipment, supplies and warranties/preventative maintenance. Any residual funds remaining at fiscal yearend are transferred back to AHS and UCalgary as required.

ATSSL Operating Statement

1 April 2016 – 31 March 2017	Total	UCalgary Funding (50%)	AHS Funding (50%)
Operating Budget	**$1,000,000**	**$500,000**	**$500,000**
Expenses			
Human Resources	$ 747,323		
Materials & Supplies	$ 98,398		
Minor Equipment	$ 24,958		
Travel & Education	$ 6,618		
Licensing Fees	$ 6,609		
Total Expenses	**$ 883,906**	**$ 441,953**	**$ 441,953**
Residual Funds Returned	**$ 116,094**	**$ 58,047**	**$ 58,047**

Learners from the core educational programs at the UCalgary including Undergraduate Medical Education (UME), Postgraduate Medical Education (PGME), Bachelor of Health Sciences (BHSc), Graduate Science Education (GSE) as well as members of AHS clinical departments and programs are not charged for access to the ATSSL. Internal users are charged for supplies, disposable and limited use items like the lumbar puncture simulator. External learners and industry users are charged on a cost recovery basis, under a fee structure determined by the ATSSL Executive Steering Committee. Revenue is not reflected in the Annual Operating Statement, but are retained in separate UCalgary project accounts and used to support additional equipment maintenance/refurbishment/replacement and educational opportunities, including conference travel for staff.

NOTABLE EVENTS

ATSSL provides a facility whereby many different disciplines and types of trainees practice and learn discipline specific procedural skills and teamwork training. Several such notable events and achievements are highlighted below.

Direct Anterior Hip Workshop

The ATSSL welcomed nearly 60 healthcare professionals including nurses, residents and surgeons to participate in a direct anterior approach workshop for total hip replacement. The event highlighted two unique operating tables designed specifically for this technique and gave learners the opportunity for hands-on practice of the procedure. The direct anterior approach has been identified to decrease patient length of stay and has shown increased patient satisfaction post operatively. The course was led by three local orthopaedic surgeons; Dr. Jim Powell, Dr. Kelly Johnston and Dr. Raj Sharma.

Vascularized Composite Allotransplant

The ATSSL Surgical Simulation Laboratory was fortunate to facilitate a unique learning event for an operating room team to perform a mock vascularized face transplant. The plastic surgery nurses, surgeons and residents split into two teams, the first carefully removed the donor tissue and the second prepared the recipient for the procedure. After hours of careful work, the donor tissue was successfully transplanted to the recipient. Feedback from one learner indicated that it was “an excellent stepping-stone into hopefully adopting the face transplant project (here in Calgary)”.

Canadian Shoulder and Elbow Society

The Canadian Shoulder and Elbow Society hosted its 6th Annual Resident Course in Calgary for the first time at the ATSSL Surgical Simulation Laboratory. The three-day course featured hands-on practice of rotator cuff and labral repairs, as well as shoulder arthroplasty. Participants spanning from across Canada consisted of 32 Senior Orthopaedic Surgery residents who were led by 27 Faculty members. The comprehensive course was designed to cover a multitude of topics in shoulder surgery and offer resident’s additional training in the subspecialty.

NOTABLE EVENTS

Student Run Simulation Team

ATSSL continued to support the Student Run Simulation Team (SRST), an extra-curricular group of undergraduate medical students who have an interest in simulation-based medical education (SBME) and has provided the opportunity to learn and teach principles of acute care medicine in a simulated environment. Early exposure to simulation has been identified as a way for medical students to engage in self-directed education. The SRST have acquired simulation training, developed a needs assessment relevant to their group, partnered with granting groups to fund their simulations, and presented their work at 3 national conferences including the 2016 Simulation Summit. Senior medical students designed and delivered didactic sessions, simulation scenarios, and debriefed the scenarios to emphasize targeted objectives. Quality improvement surveys and participant feedback contributed to ongoing program review and refinement. As our commitment to faculty development, ATSSL closely mentors their activities and provides guidance for the SRST to facilitate the simulation-based educational design of other undergraduate student interest groups.

PGME Simulation Symposium

ATSSL hosted the 2nd Annual PGME Simulation Education and Research Symposium in October 2016. The intent of this event was to showcase work in simulation education and research, and to encourage collaborations among researchers with common interests. We welcomed national medical simulation experts as keynote speakers. As we move towards competency-based education, the objective was to increase our use of and awareness of various simulation modalities for learning, assessment and research. We concentrated our resources to support and recognize clinical teaching, increase research capabilities, integrate competency-based curricula, and foster leadership development.

Innovation in Simulation

Surgical simulation is increasingly being used for training and assessment of surgical competence in medical education. ATSSL provides an optimal learning environment for the development of such skills to over 1100 surgical residents and faculty. ATSSL hosted a multitude of surgical procedure and anatomy labs using box trainers, cadavers and animal models. The ATSSL has developed simulation models specifically to achieve functional task alignment for clinical procedures based on the needs of residency training programs. This may vary from the replication of an aspect of a task, e.g. vessel ligation, through to increasing levels of complexity in interprofessional teamwork simulation scenarios e.g. multidisciplinary theatre-based simulation design and participation. ATSSL highlights the advantages of using simulation models in training and assessment as part of competency based medical curricular initiative. Examples include increasing patient safety, repeated practice, tailored and deliberate practice, measure of retention and accuracy, advancement of evaluative standards of student performance.

ACTIVE RESEARCH AND SCHOLARSHIP

Interprofessional Education - Alberta International Medical Graduate (AIMG) Program

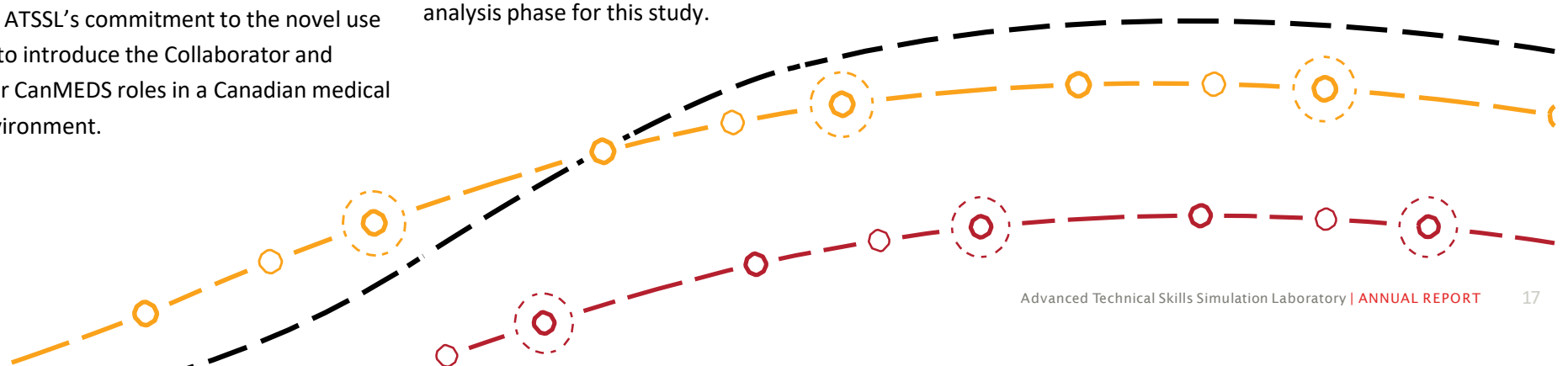
Collaborative efforts between the ATSSL and the AIMG Program were initiated to develop a curriculum and theatre-based simulation scenarios for international medical graduates. The program provides an orientation to the Canadian medical educational environment, prior to high-stakes work-based assessment which precedes acceptance into Alberta residency training. The goal was to introduce concepts of teamwork and interprofessional collaboration. Objectives were to be blueprinted against the AFMC 2016 Entrustable Professional Activities for graduates of Canadian medical schools, and the UCalgary's ATSSL TeamScheme. Scenarios were developed to elicit explicit interactions between participants and other healthcare professionals, patients and family members. Teamwork confidence questionnaires will be completed prior to and after completion of the simulation sessions. This work demonstrates ATSSL's commitment to the novel use of simulation to introduce the Collaborator and Communicator CanMEDS roles in a Canadian medical education environment.

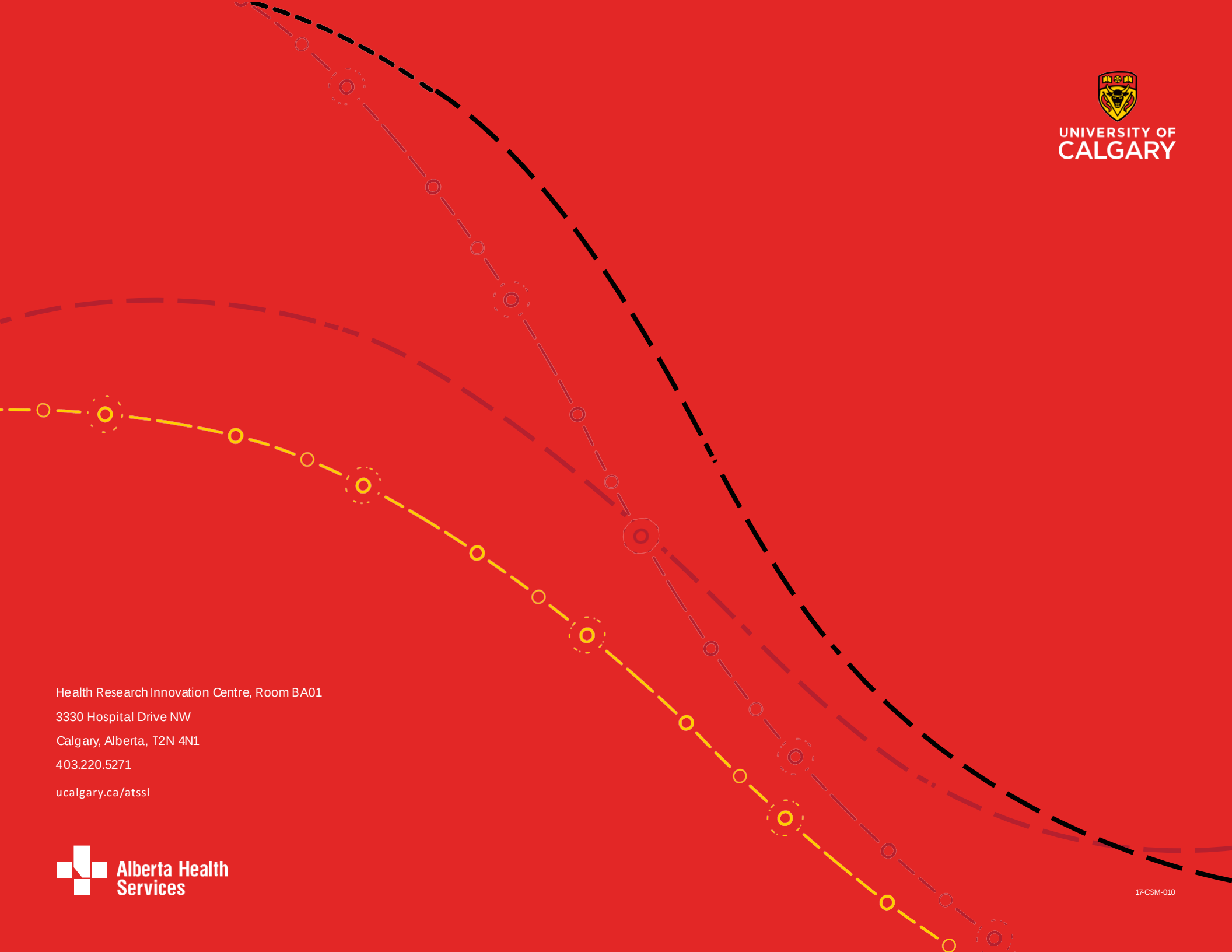
Point of Care Ultrasound (POCUS)

This multi-site study with Memorial University involves validating a POCUS assessment tool for training health care professionals. The UCalgary, Faculty of Medicine, Undergraduate Medical Education (UME), Post Graduate Medical Education (PGME) and Continuing Medical Educations (CME) conducts teaching sessions whereby its students use ultrasound technology on volunteer models/participants. The purpose of the ultrasound teaching sessions are for students to learn about normal anatomical structures of patients and about the use of ultrasound diagnostic equipment generally; the sessions are specifically not for diagnosing pathologies or making any other findings in respect of the model/participant. The collaborative study with Memorial University involves acquiring basic scans from beginner, intermediate and expert users, then randomizing the scans to expert raters across the country to validate an ultrasound assessment tool. We have completed the data gathering and are in the analysis phase for this study.

Microsurgery Curriculum

Dr. Claire Temple-Oberle was awarded the 2017 RCPSC Robert Maudsley grant to enhance the microsurgery skills curriculum for surgical residents. The grant enabled a focus on competency-based surgical education (CBSE) to help trainees achieve competency in microsurgery skills acquisition using simulation. This started with a monthly microsurgical skills training curriculum for UCalgary residents. The in depth curriculum involved pre-session reading and preparation, two-hour small group sessions with faculty guidance and practice with wet specimens. This was followed by a formalized self-assessment and direct feedback component. A deliberate practice prescription was provided to the learners to guide them before their next session.





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