THE UNIVERSITY OF TORONTO

SURGICAL SKILLS CENTRE

AT MOUNT SINAI HOSPITAL

ANNUAL REPORT

07

It is not the **strongest**
of the species that survives,

nor the most **intelligent**
that survives.

It is the one that is
most **adaptable** to
Change
- Charles Darwin

Vision

Traditionally, surgical skills have been acquired in the operating room. The complexity of surgical procedures and the premium placed on surgical time has increased. We can no longer expect surgeons to acquire novel skills in the operating room.

The University of Toronto Surgical Skills Centre at Mount Sinai Hospital provides a laboratory setting where basic and complex surgical procedures can be learned and practiced. Surgeons will achieve a higher level of expertise more rapidly in a laboratory setting where they can employ educational principals of repeated practice with feedback. Educational research is conducted in skills acquisition and evaluation. This research will provide answers to fundamental educational issues and allow testing of innovations in surgery.

It is our goal that this facility become an internationally recognized centre of excellence in surgical education.

MISSION

1. To change the way fundamental surgical skills are taught and evaluated.
2. To provide a platform for continuing education in surgical skills.
3. To create a laboratory for research and development of surgical skills innovation.
4. To promote and enhance teaching surgical skills through the Surgical Skills Centre.

Every year, the Surgical Skills Centre trains more students and surgeons, hosts more courses and collaborates with more teams, and this year, is certainly no exception.

In fact, while our growth has been consistently building for eight years, this year, it dramatically accelerated.

We celebrated an expansion that doubled our physical space in size, allowing us to serve twice as many students and professionals and offering them an abundance of new technology to practice rare and intricate procedures.

We are also seeing first-hand, the success of our students. Our first students have now graduated and are faced with the unique position of being on the training side of the Surgical Skills Lab benches.

Finally, we continue to expand our reach across the globe, helping others set up similar facilities, including one in Ethiopia that will help bring trained doctors to a poor and remote area, desperate in need of medical direction and attention.

The growth and success of this Centre is, without question, a direct result of the passion and commitment of those who come into the Centre. Our dedicated internal team, teaching faculty, students or international guests all contribute to the effectiveness of the training delivered in the centre.

We are also fortunate to have the support of a number of donors who have helped make many of our successes possible, greatly enhancing our ability to provide high quality education to our trainees.

It is with enthusiasm and excitement that I look forward to this upcoming year – our 10th anniversary! We will continue to build on our momentum and I look forward to another successful year.

Helen MacRae, MD, FRCSC
D.H. Gales Director
Surgical Skills Centre

The Surgical Skills Centre is not only a leader in Canada in surgical education, but, I am proud to say, a leader in the world.

Under the superb leadership of our Director, Helen MacRae and our Manager, Lisa Satterthwaite, our unit continues to thrive through a combination of extreme dedication to the Centre and hard work towards achieving our mission.

Our recent physical expansion has doubled the number of students and surgeons we can train annually, to nearly 8,000. We offer a multitude of continuing education programs for learners of all ages and levels and our new facility also offers greater, more advanced simulation equipment providing the most realistic surgical experience.

We are also focused on continuing education research. We are specifically engaged in a program of research that investigates the best methods of educational delivery to achieve our goals of accrual of novel skills that will be sustained over time and used to change practice.

The Surgical Skills Centre has been an enormous benefit to the partnership between Mount Sinai Hospital and the University of Toronto's Department of Surgery. Without a doubt, the U of T looks to our laboratory as an excellent example of how the synergies between two organizations can enable a Centre like ours to play on the world stage.

Recently, a group representing the Faculties of Medicine and Nursing at the University of Toronto, TASHN, and the Michener Institute spearheaded a request for $4.9 million to create a network of simulation across Toronto and beyond. I am pleased to say that this governmental award has been granted, an administrative centre is being created at Mount Sinai, and the process for searching for a Director has started. It is successes such as this which make the University of Toronto environment so rich and make it an optimal place to get teams together to push the focus of simulation as an important teaching tool for our programs.

Our success of the last year will undoubtedly spawn more success, but also more hard work. We are dedicated to maintaining our position as one of the preeminent skills labs in the world, and can do so through a continued focus on curricular development, an augmented focus on the use of simulation as a fundamental part of training, and a dedication to research in this area.

Richard Reznick, MD, FRCSC, R.S.
McLaughlin Professor and Chair
Department of Surgery, University of Toronto

STAFF

Dr. Helen MacRae
D. H. Gales Director

Dr. MacRae is a General and Colorectal Surgeon at Mount Sinai Hospital, with a special interest in laparoscopic colorectal surgery. She completed medical school and a general surgery residency in Edmonton, Alberta, and fellowship training in colorectal surgery at the University of Toronto. Dr. MacRae has a Master's degree in Medical Education from Springfield, Illinois. Her research interests are in the area of Evaluation of Clinical Competence and Acquisition of Technical Skills.

Lisa Satterthwaite
Manager

Ms. Satterthwaite holds an RPN diploma from Scarborough General Hospital and an honours diploma in Operating Room Techniques from Humber College. Before joining the Skills Centre in 2000, she worked for 15 years in the Toronto General Hospital OR. Her primary surgical focus was the Liver Transplant Team where she was a senior team member focusing on training and development for new staff members.

Shunne Leung
Assistant Manager

Mr. Leung holds a B.Sc. degree in Pharmacology and a Certificate of Business from the University of Toronto. Before joining the Skills Lab in 2001, he was Shift Supervisor in the Toronto General Hospital's Central Processing Department, where he contributed to meeting the supply and sterile processing requirements of operating suites in the Toronto General and Princess Margaret Hospitals.

Dezan Rego
Surgical Technician

Ms. Rego has worked at Mount Sinai Hospital since 1978. In 1983, she began working in the Operating Room where she was a senior OR instrument technician and team leader who trained the majority of new staff. Ms. Rego holds a diploma in Sterile Supply Processing from Centennial College. In 2001 and 2006 Ms. Rego was the proud recipient of the Karen McGibbon Award of Excellence from Mount Sinai Hospital.

Marina Romanova
Surgical Technician

Ms. Romanova holds an M.D. diploma from Riga Medical Institute, Latvia, and a PhD in medical Science from the University of Russia. She attained a certificate in Large and Small Animal Care from the University of Toronto. Before joining the team, she was a cardiology Research Technician at St. Michael's Hospital.

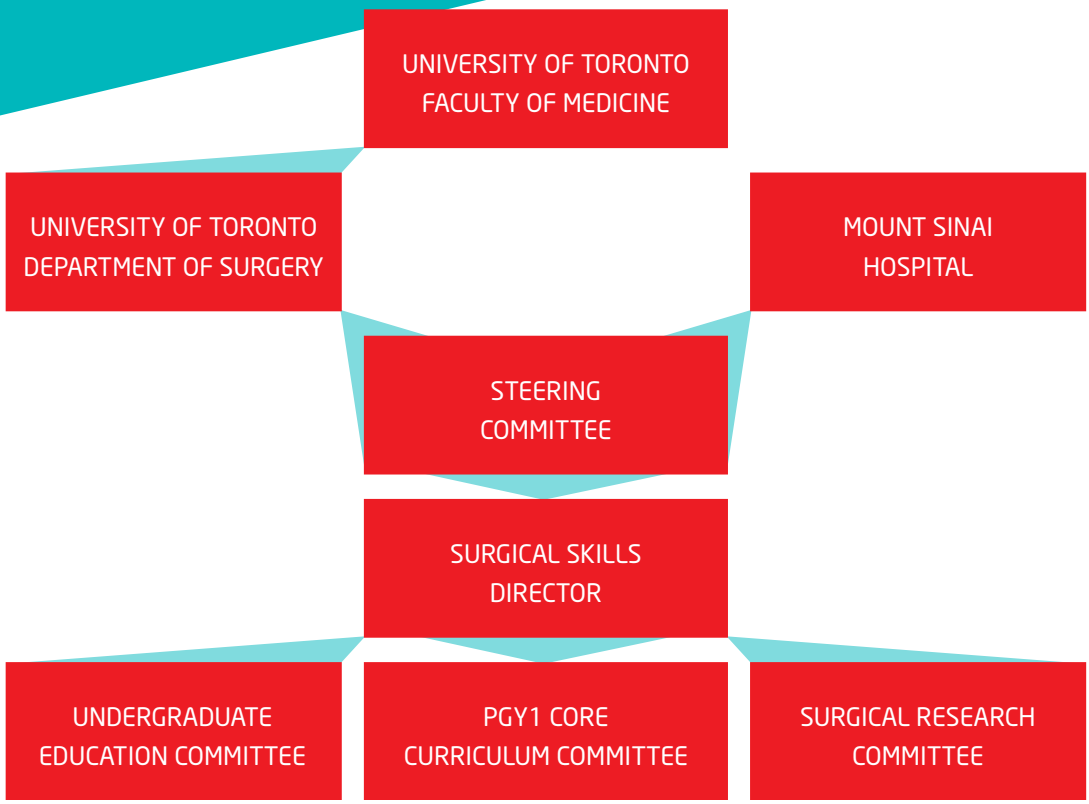
Serenity Thomas
Surgical Technician

Ms. Thomas holds a B.A. in Medical Ethics from the University of Toronto. She currently works part-time in the Lab assisting with all course duties, lab set-up and syllabus revisions.

Jason Faria
Surgical Technician

Mr. Faria is the newest team member at the Surgical Skills Centre. He joins our team full time in February 2008 following an intensive co-op placement year from Central Commerce Collegiate in Toronto. His keen interest and team spirit will be a wonderful asset to our group.

GOVERNANCE



The Surgical Skills Centre is a joint initiative of the University of Toronto Department of Surgery and Mount Sinai Hospital.

The Faculty of Medicine at the University of Toronto is responsible for the administration of funds and liaison with industry.

A steering committee, with representation from both the University of Toronto and Mount Sinai Hospital, oversees the Centre's operations in consult with the D. H. Gales Director.

A Curriculum Committee, chaired by the Director, guides the development and delivery of the Surgical Skills Centre's core curriculum. The committee has resentatives from each of the Divisions of the Department of Surgery, the Department of Otolaryngology, the Department of Obstetrics and Gynaecology and surgical residents and educators.

ACCREDITATION

The Surgical Skills Centre has been awarded Accreditation by the American College of Surgeons' Program for Accreditation of Education Institutes for a three-year term, until December 2009.

PHYSICAL EXPANSION

The tremendous success of the Surgical Skills Centre and the resulting need to meet the increasing demand for expert surgical training, led to a major expansion project, completed in February 2007.

Not only had the demand for undergraduate training climbed beyond capacity, but so had the demand from surgeons visiting from around the world to use the facilities to study and hone their skills. In addition, there had been a significant increase in international educational specialists studying our proven model of education to launch their own centres.

The Centre has now doubled in size, to 8,000 sq. ft. and includes a 40 seat teaching area, a virtual operating room, monitor room, practice room and research lab. We have integrated state-of-the-art telecommunications and presentation technologies and developed connections to operating rooms for both live and interactive surgical demonstrations from internal and external sources. A double LCD projection, variable lighting and sound, independent climate control, sound-proofing blocks, mounted wall cameras and a state-of-the-art document camera keep us on the leading-edge of surgical education.

With this new addition, we have had the opportunity to run different styles of programs using both the wet lab and the didactic facility simultaneously, doubling our capacity for educational sessions.

There has also been a marked increase in the number of practice sessions, primarily for microsurgery and laparoscopy, among both residents and surgeons, in the new Quiet Practice Room.

In the next year, we look forward to working closely with Dr. Randy Wax, Medical Director Program for Resuscitation Education and Patient Safety at Mount Sinai Hospital, and his team to develop programming for SimMan and the Virtual Operating Room. This leading-edge OR, equipped with an operating table, surgical lighting, patient-monitoring and therapy devices and supplies, allows clinicians to work naturally, an enhancing their practice experience.

PROFESSIONAL GROWTH

For nearly a decade, residents of all skill levels and surgical disciplines have come through our doors to learn everything from basic knot-tying to complex, minimally invasive techniques.

The chief objective of the Surgical Skills Centre is to offer residents the opportunity to acquire fundamental skills in an appropriate learning environment that allows for repeated practice with feedback. This approach to teaching, combined with excellent operative experiences has greatly enhanced the learning and acquisition of surgical skills.

To date, more than 120 residents per year are booking independent practice sessions.

DEPARTMENT OF SURGERY

Several divisions within the Department of Surgery have implemented comprehensive curricula, held in weekly, monthly or summer sessions. Some examples include:

DIVISION OF UROLOGY	DIVISION OF GENERAL SURGERY	DIVISION OF CARDIAC SURGERY
TURP and Bladder Resection	Knot Tying and Suturing	Aortic Valve Anatomy
Laparoscopic Techniques	Abdominal Closure	Aortic Stentless Valve Replacement
Cystectomy and Uretoscopy	Minimally Invasive Surgery	Mitral Valve Anatomy and Annuloplasty
DIVISION OF PLASTIC SURGERY	**DIVISION OF ORTHOPAEDICS**	**DIVISION OF NEUROSURGERY**
Multiple Site Flap Creation	Knee Scope	Endoscopy
Craniofacial Plating	Hand Surgery	Spinal Surgery
Microsurgery	Shoulder Arthroscopy	Skull Plating Course
Hand Fixation	External Fixation Knee and Hip	

DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

The Department of Obstetrics and Gynaecology's postgraduate curriculum encompasses 23 PGY1-2 courses and seven PGY3-5 courses. The two-year core curriculum, led by Dr. Richard Pittini, involves participation in Objective Structured Assessment of Technical Skills (OSATS) exams both pre and post-program. This exam provides invaluable insight into the residents' strengths and weaknesses, allowing for the design of individualized learning programs. The core curriculum sessions provide hands-on practice in a variety of common procedures including operative delivery, perineal repair, vascular injury, bowel repair and bladder-related procedures.

Senior residents also participate in didactic sessions and hands-on laboratory training in advanced endoscopic surgery. These sessions detail topics including the prevention, recognition, and treatment of complications related to minimally invasive surgery as well as practice in electrosurgery.

DEPARTMENT OF OTOLARYNGOLOGY

The Department of Otolaryngology curriculum offers residents the opportunity to practice hands-on skills on a variety of high-fidelity inanimate models. This curriculum, led by Dr. Ian Witterick, involves didactic lectures, practical workshops and video conferencing. Key courses this year included temporal bone drilling and sinus sessions.

MANY RESIDENTS WHO BEGAN THEIR SURGICAL TRAINING AT THE SKILLS LAB AS PGY1S NINE YEARS AGO, ARE NOW FULL-TIME FACULTY SURGEONS AT THE UNIVERSITY OF TORONTO AND TRIBUTE THEIR CONFIDENCE AND SUCCESS TO THEIR TRAINING AT THE SURGICAL SKILLS CENTRE.

Markku Nousiainen, B.A. (Hons.), M.S., M.D., FRCS(C)

Orthopaedic Surgeon

Holland Orthopaedic and Arthritic Centre

Sunnybrook Health Sciences Centre

"My first experience with the Surgical Skills Centre was as an orthopaedic surgery resident. During these years of training, I learned, practiced, and refined my ability to perform the surgical skills related to my subspecialty and the experience became a wonderful springboard from which my co-residents and I could apply our skills to the patients we cared for.

The Skills Lab not only helped develop my clinical skills but it also greatly fostered my academic interest in surgical education. Having such a dedicated, well-staffed, and well-supplied facility made it easy to perform research for my Master of Education degree, which I concurrently did during a clinical fellowship at the University of Toronto.

I am now back as a surgeon-investigator and I continue to do research in the Lab. Why? Because I would be foolish not to. Having trained at other facilities in Canada and the United States, I realize how lucky the faculty and trainees at the University of Toronto are to have the Skills Lab. I can think of no other place where one can find such a well-run facility that makes doing research and training so easy."

Kyle Wanzel, MD, MEd, FRCS(C)

Division of Plastic Surgery

St. Joseph's Health Centre

University of Toronto

"During my surgical training, I was fortunate enough to have had a major involvement in the Surgical Skills Centre through two distinct avenues. The first was as a surgical resident in the University of Toronto Plastic Surgery training program, and the second was as a research Fellow, while completing a Master of Education degree and Fellowship in Surgical Education, as part of the Surgeon Scientist Program.

During my research Fellowship, the Surgical Skills Centre was in its infancy and some of my research projects evaluated the usefulness of models to teach surgery, surgical curriculum in the Centre and how visual-spatial ability related to surgery.

I experienced everything the Skills Centre had to offer as a surgical trainee during our Division of Plastic Surgery teaching sessions, which served as a valuable component of my surgical training.

Drawing from experiences from both perspectives, to me, the Surgical Skills Centre is an invaluable part of modern day surgical training. It is an absolute asset to the University of Toronto surgical training programs, is the leading centre in Canada, and something that I am proud to have been involved in."

Ethan D. Grober, MD, MEd, FRCSC

Staff Urologist, Mount Sinai Hospital & Women's College Hospital

"I have benefited from the Surgical Skills Centre in a variety of ways.

As a resident, I was fortunate for the opportunity to learn and practice both basic and complex technical skills prior to direct clinical application. As a surgeon-scientist with a focus on surgical education the Skills Centre represented the ideal laboratory for controlled technical skills evaluation. The body of research generated from projects using the skills lab truly is impressive. As a new surgical faculty member, the Surgical Skills Centre provides a relaxed environment for teaching new surgical trainees.

Whenever I travel to other academic centers, I make it a point to highlight our Surgical Skills Centre and the reaction is consistently one of genuine admiration."

ON THE OPPOSITE SIDE OF THE TEACHING BENCH, OUR FACULTY HAVE REGULARLY ATTRIBUTED THEIR SKILLS AND PROFESSIONAL ACCOMPLISHMENTS TO THE FORUM THE SURGICAL SKILLS CENTRE HAS PROVIDED THEM.

Walid Farhat, MD, FRCSC

Associate Professor, Department of Surgery

Pediatric Urologist, Sick Kids

University of Toronto

"As a paediatric urologist, the instrumentation and innovative training tools at the Surgical Skills Centre have been invaluable to our ability to expand the use of laparoscopy in the operating room for advanced reconstructive surgery and to explore new surgical techniques to treat complex congenital diseases.

As a teacher, I have used the Skills Lab to develop a laparoscopic training course for Pediatric Urology and General Surgery Fellows. The knowledgeable staff enhanced our team educational benefits tremendously and, with the development of an education model for assessing initial and acquired skills, we have enhanced and strengthened the Fellowship in paediatric laparoscopic training at Sick Kids.

This past July, we funded a unique training course for 20 North American Urology Fellows and nine International preceptors. This was an excellent opportunity to establish Sick Kids as a centre for teaching, with resources for assessment and educational opportunities available to us through the Skills Centre.

The Surgical Skills Centre has strengthened our division, given credibility to the Fellowship program at the University of Toronto and supported the educational values of Sick Kids."

Richard Pittini, MD, MEd, FRCSC

Senior Academic Coordinator, MedSIS & Evaluations

Associate Professor of Obstetrics & Gynaecology, University of Toronto

Sunnybrook Health Sciences Centre at Women's College Hospital

"I have been involved with the Obstetrics and Gynaecology curriculum since the opening of the Surgical Skills Centre and I have had the opportunity to develop a number of teaching models. Each year, I plan, evaluate and attend most of the 23 simulation sessions, frequently cited as one of the most appealing features of the Postgraduate program in Toronto.

The experience I have gained through the Surgical Skills Centre has allowed me to be a resource for other universities striving to develop their own programs. I have been invited to present at local, regional, and national meetings on teaching through simulation, some of which have led to the development of international networks of collaborators interested in this model.

To capitalize on opportunities unique to the simulated teaching environment, I have had the forum to adapt my own teaching techniques. I have learned to identify learner needs and transform them into new and innovative models with the invaluable contribution of the Centre's academic, administrative and technical staff. "

Eric Massicotte, MD, MSc, FRCSC

Assistant Professor, University of Toronto

Staff Neurosurgeon

Toronto Western Hospital

"As a surgeon-educator with the University of Toronto I have the privilege of teaching this - and the next - generation of neurosurgeons. Most think of the Surgical Skills Centre as a platform for teaching medical students, however medicine is a career in learning. The Surgical Skills Centre at the Mount Sinai Hospital is not only an excellent resource but also an ally in this task.

The rapid growth of technology has allowed us to offer safer and more efficient healthcare. Having the opportunity to see and actually try new techniques in a safe environment benefits not only future patients, but students and skilled surgeons alike who gain confidence in their abilities.

I look forward to organizing educational opportunities at the Skills Centre because we share the same mandate: to educate using the best, and most efficient, method. Using different modalities enhances the quality of my teaching and allows for improvements. Our residents, who are exposed to this wonderful learning environment, see the greatest impact. "

CENTRE FOR THE EVALUATION OF HEALTHCARE PROFESSIONALS EDUCATED ABROAD (CEHPEA)

The Centre for the Evaluation of Healthcare Professionals Educated Abroad (CEHPEA), formerly called International Medical Graduates Ontario (IMGO), continues to use the Surgical Skills Centre as a technical testing site for the divisions of orthopaedics, general surgery and otolaryngology. These technical skills exams are an important aspect of the overall assessment of candidates that would like to enter the Practice Ready Assessment level or PGY2.

CORE CURRICULUM

Approximately 42 first-year residents from all divisions participate in the 28-week Core Curriculum, which involves weekly sessions that concentrate on skills required across surgical disciplines. Student to faculty ratios are one faculty to six students, allowing residents to receive independent teaching and feedback on their techniques. The core curriculum is set and administered by a Core Curriculum Committee made up of surgeons, educators and residents from across divisions.

DATE	COURSE
September 12 2006	Principles of Asepsis and Instrument ID
September 19 2006	Instrument Handling and Knot Tying/Suturing
September 26 2006	Tissue Handling Dissection and Wound Closure
October 3 2006	Tendon Injuries and Carpal Tunnel Release
October 10 2006	Abdominal Wound Closure/ Poly Patient (inst passing and team work)
October 17 2006	Line Insertion
October 24 2006	Mini Objective Structured Assessment of Technical Skills (MOSATS)
October 31 2006	Airway Management and Surgical Airway
November 7 2006	Catheterization, Suprapubic and Urethral
November 14 2006	Advanced Tissue Handling and Wound Closure
November 21 2006	Chest Tube and Thoracentisis
November 28 2006	Bone Fixation and Casting
December 5 2006	Bowel Anastomosis - Hand sewn and Stapled
January 9 2007	MOSATS
January 16 2007	Microsurgery and Bone Harvesting
January 23 2007	Microsurgery and Skin Grafting
January 30 2007	Laparasocpic Skills 1: Practice Session
February 6 2007	Laparoscopic Skills 2: Arthroscopy - Gallbladder & Knot Tying
February 13 2007	Laparoscopic Skills 3: Arthroscopy - Gallbladder & Knot Tying
February 20 2007	Laparoscopic Skills Competition
February 27 2007	MOSATS
March 6 2007	Vascular Control - Arterial and IVC
March 13 2007	Skin Liver and Breast Biopsy and Electrosurgery
April 10 2007	Pig Lab Group A / Vascular Control - Arterial and IVC
April 17 2007	Pig Lab Group B / Vascular Control - Arterial and IVC
April 24 2007	Practice Session
May 1 2007	Practice Session
May 8 2007	Practice Session
May 15 2007	Objective Structured Assessment of Technical Skills (OSATS)

UNDERGRADUATE EDUCATION

The Undergraduate education program – fittingly called the *Crash Course in Surgery* – continued for its second year at the Surgical Skills Centre. This initiative, led by Dr. David Backstein, the Director of Undergraduate Surgical Education at the University of Toronto, offers an intensive surgical skills experience for students prior to the initiation of their surgical clerkship.

The success of this concentrated program has prompted several other university centres to express interest in developing similar programs for the students.

This formal curriculum strives to not only increase the technical competence of the students, but to smooth their transition into the surgical field by providing a relaxed and secure environment in which to learn.

Every six weeks, prior to beginning their surgical rotation, 40 third year students spend a full week of training and seminars in the Skills Centre. Here, students gain a better understanding of the field of surgery and the surgical patient while learning and practicing fundamental technical skills, including suturing, knot tying, chest tube insertion, casting, lumbar puncture and catheterization.

The acquisition of these basic skills has resulted in more confident and capable students who feel more comfortable contributing once they enter the operating room.

And, as the number of medical students entering the University of Toronto increases, the expansion of the Skills Lab has been tremendous, allowing faculty to continue their didactic teaching in the lab environs as opposed to distant, non-surgical areas.

Undergraduate Technical Skills Curriculum Includes:

Day 1 – Knot tying, suturing, gowning and gloving
Day 2 – Suturing and Catheterization
Day 3 – Casting
Day 4 – Chest tube insertion and lumbar puncture
Day 5 – Trauma training

CO-OPERATIVE EDUCATION

For the past eight years, the Surgical Skills Centre has hosted a tremendously successful co-operative education program that has been mutually beneficial for both students and Centre.

Our co-op students have joined us through various avenues, whether it is a high school, college or university program. No matter their source, they all share one thing in common: a desire to gain skills and experience in the medical field.

To date, we have had more than 10 co-op students come through our doors. Each time they come to the lab, they are involved in everything from setting up educational programming to participating in research projects. While students got the hands on experience they craved, the Skills Lab gained valuable assistance and fresh ideas.

Using their time at the Skills Lab as a springboard, we are pleased to share that some of our co-op students have already gone on to pursue careers in the medical field.

Jana Enderes Volunteer

"I moved to Toronto from Germany and have volunteered at the Surgical Skills Centre since October 2006. My experience in the Centre exposed me to a whole new field: the field of medicine. Through my training as a surgical technician for the lab, I have learned a lot about anatomy, physiology and terminology and now know how to set up and run medical training stations.

The Skills Lab is a unique and amazing place to teach, learn and practice. My time here has been irreplaceable. Not only have I learned many new things – which will be very helpful for my career in medicine – I also met wonderful people and friends who have helped make me feel at home.

I am moving back to Germany to pursue a career in medicine but I will be back to visit the Surgical Skills Centre."

ADDITIONAL CURRICULA

Department of Emergency Medicine

Each fall Dr. Shirley Lee Director of Education for the Department of Emergency Medicine at Mount Sinai Hospital, organizes the EM Skills Training Session for 20 residents. The skills sets include; chest tube insertion, extensor tendon repair, interosseos bone harvesting, bronchoscopy, and lumbar puncture. Also organized by Dr. Lee was a four week training session for emergency nurses on male and female catheterization.

Department of Internal Medicine

Dr. Ken Locke organizes this annual four week program. The course focuses on training in lumbar puncture, bone marrow aspiration, thoracentisis, and central line insertion. More than 120 internal medicine residents participate in this curriculum.

Department of Respirology

Led by Dr. Jay Yang of St. Michael's Hospital, this annual summer program is a highly requested program by all residents. Each session concludes with a "scope off" competition.

Department of Anaesthesia

In 2007, Dr. Jane Heggie from the Department of Anaesthesia organized a preliminary course on Trans Esophageal Echocardiogram (TEE) for a multidisciplinary group including anaesthetists, cardiologists, nurses, and surgeons. The course was then repeated during the fifth annual Perioperative Transesophageal Echocardiography Symposium. There were over 30 participants in the course.

CONTINUING MEDICAL EDUCATION SESSIONS

Acclarent *ENT* – Professional development for sinuplasty procedure

Apneon *Oropharyngeal Surgery*

Bard *Inguinal Hernia Repair* – Anatomy session
Pelvic Floor Reconstruction – Reconstruction in the lithotomy position

Kyphon *Orthopaedics* – Course on balloon kypho plasty, led by Dr. Faheem Sandhu

Medtronic *Spine* – Training by Dr. Raja Rampersaud

Stryker *Shoulder Arthroscopy* – Education in diagnosis, anatomy, SLAP Repairs and rotator cuff repairs
Educational Film Production – Production of industrial training videos that will be used to educate residents and faculty. *Craniomaxillofacial Plating* – Workshop for nurses from TGH. *Orthopaedics* – Current Techniques in Hip Fractures

Zimmer *Hip and Knee Course* – a Training in Unicompartmental Knee MIS TKA procedure, followed by a revision hip telecast with Dr. Allan Gross. *Trauma Course* – Professional development course for nurses. *Spine Course* – Workshop on Trabecular Metal Technology (TMT) and dynamic stabilization

SURGICAL SKILLS CENTRE PUBLICATIONS

1. MacRae HM, Satterthwaite L, Reznick RK: Setting up a surgical skills centre. World Journal of Surgery 2008: 32(2): pp 198-95. PA
2. Moulton CA, Regehr G, Myropoulos, MacRae HM: Slowing down when you should: a new model of expert judgment. Academic Medicine 2007: 82(10): pp S109-16. C
3. Park J, MacRae H, Musselman LJ, rosso P, Hamstra SJ, Wolman S, Reznick RK: Randomized controlled trial of virtual reality simulator training: transfer to live patients. American Journal of Surgery 2007: 194(2): pp 205-11. CPA
4. Park J, WoodrowSI, Reznick RK, Beales J, MacRae HM: Patient Care is colective responsibility: perceptions of professional responsibility in surgery. Surgery 2007: 145(1): pp 111-8. C
5. Sidhu RS, Park J, Brydges R, Macrae HM, Dubrowski A: Laboratory based vascular anastomosis training: A randomized controlled trial evaluating the effects of bench model fidelity and level of training on skill acquisition. Journal of Vascular Surgery 2007: 45(2): pp 343-9. C
6. Nathan Jowett, Vicki LeBlanc, George Xeroulis, Helen MacRae, and Adam Dubrowski: Surgical Skill Acquisition with Self-Directed Practice Using Computer-Based Video Training. American Journal of Surgery 2007: 193(2): pp 237-242. C
7. Adam Dubrowski, Jason Park, Carol-anne Moulton, James Larmer, and Helen MacRae: A Comparison of Single- and Multiple-Stage Aproaches to Teaching Laparoscopic Suturing. American Journal of Surgery 2007: 193(2): pp 269-73. C
8. Dorman, K., Satterthwaite, L., Byrne, N., Derbew, M., and Dubrowski, A. (2007) The Case for Surgical Skills Centres in Sub Saharan Africa: The Benefits and the Challenges. East and Central African Journal of Surgery, Vol. 12, No. 1, pp 4-6.

RESEARCH

In September 2006, the Surgical Skills Centre welcomed Dr. Heather Carnahan, a part-time Research Scientist from the University of Waterloo.

This year, the research group has focused on two themes at the Skills Lab: self-directed learning and understanding the requirements for an arthroscopy simulator.

Self-Directed Learning

Ph.D. student Ryan Brydges is studying the effects of self-regulated access to feedback on how well medical students learned the skill of wound closure. His findings show that students chose to use video to learn movement process, and that self-regulated practice resulted in better retention of basic technical skills compared to a prescribed practice schedule. Therefore, he proposes that clinical educators who use instructional videos should allow students to learn in a self-regulated manner, as research indicates medical students use learning tools beneficial to their skill acquisition.

Dr. Oleg Safir, a Mount Sinai surgeon who is also completing a Master's degree in medical education, is currently exploring the effects of the self-selection of practice schedules on motor learning. While his work is still in progress, he hypothesizes that the freedom to choose the variations of a suturing skill a student practices, allows for better retention of the skill.

Requirements for an Arthroscopy Simulator

The goals of this work are to understand the requirements for an arthroscopy simulator and to evaluate the effectiveness of various types of simulation training on arthroscopy performance. Early results have shown that practice on spatial-motor enabling skills enhances later arthroscopic performance. The findings of this research will be used to guide the future development of an arthroscopy training simulator. Collaborators in this work include Drs. David Backstein, Adam Dubrowski and Oleg Safir.

PUBLICATIONS

1 *Leming, J. K., Dorman, K., Brydges, R., Carnahan, H., & Dubrowski, A. (2007). Tensiometry as a measure of improvement in knot quality in undergraduate medical students. Advances in Health Sciences Education, 12, 331-344.

2 *Gonzalez D, Carnahan H, *Praamsma M, & Dubrowski A. (2007). Control of laparoscopic instrument motion in an inanimate bench model: Implications for the training and the evaluation of technical skills (grasping). Applied Ergonomics, 38, 123-132.

3 *Brydges R, Carnahan H, Backstein D, & Dubrowski A. (2007). Application of motor learning principles to complex surgical tasks: searching for the optimal practice schedule. Journal of Motor Behavior, 39, 40-8.

4 Ni, L., Wang, D.W.L., Dubrowski, A., & Carnahan, H. (2007). A user friendly interface for surgeons to create haptic effects in medical simulation. Studies in Health Technology and Informatics,125, 349-351.

5 *Hung, C., Dubrowski, A., *Gonzalez, D., & Carnahan, H. (2007). Surface exploration using instruments: The perception of friction. Studies in Health Technology and Informatics, 125, 191-193.

6 Schneider, S., Brummer, V., Gobel, S., Carnahan, H., Dubrowski, A., & Struder, H.K. (2007). Parabolic flight experience is related to increased release of stress hormones. European Journal of Applied Physiology, 100, 679-687.

7 *Brydges, R., Dubrowski, A., & Carnahan, H. (2007). Attentional focus and motor learning: Applications to Health Professions Education. Bewegung und Training, 1, 15-16.

8 *Gonzalez, D., *Kowalski, K., Dubrowski, A., & Carnahan, H. (2007). Magnification of the visual field and touch perception when exploring surfaces with the index finger and surgical snaps. Human Factors, 49, 679-687.

9 Lund, L., Dubrowski, A., & Carnahan H. (2007). A modular approach for training laparoscopy to Urologists. British Journal of Urology, 6, 1216-1218.

10 Schneider, S., Brurmmer, V., Carnahan, H., Dubrowski, A., Askew, C.D., Struder, H.K. (2007). Stress hormone stability: Processing of blood samples collected during parabolic flight - a preflight comparison of different protocols. Clinical Biochemistry, 40, 1332-1335.

11 Schneider, S., Brümmer,V., Mierau, A., Carnahan, H., Dubrowski, A., & Strüder, H. (2007). Increased brain cortical activity during parabolic flights has no influence on a motor tracking task. Experimental Brain Research. Nov. 1 [Epub ahead of print].

12 Carnahan, H., McKee, P., & *Chen, A. (2007). The influence of orthotic design on grip force. Proceedings of the 2nd International Conference on Technology and Aging (ICTA). (4 pages), Toronto, ON.

13 Singh, G., Pichora-Fuller, K., Hayes, D., & Carnahan, H. (2007). The role of manual dexterity in hearing aid ergonomics. Proceedings of the 2nd International Conference on Technology and Aging (ICTA). (4 pages), Toronto, ON.

14 Carnahan, H., Harvey, A., & Dubrowski, A. (2007). Strategies Related to Effective Design in Surgical Simulation. Proceedings of Cybernetics of Information Technology and Systems and Applications, 242- 246, Orlando, FL.

* indicates a student under the supervision of Dr. Heather Carnahan

INTERNATIONAL OUTREACH

The University of Toronto's Surgical Skills Centre has set a gold standard for surgical education and, as a proven model, has attracted international attention.

Staff and faculty of the Skills Centre are regularly invited to consult with hospitals and universities around the world and help them develop their own surgical skills programs and facilities.

This year, one of the most rewarding collaborative opportunities was working with staff at the Black Lion Hospital on surgical education and ultimately, building a Surgical Skills Centre in the heart of Addis Ababa, Ethiopia.

In Addis Ababa, surgeons are rare and there is a vast complexity of cases. For every 100,000 people, there are only three physicians, with even lower ratios in surgery where skilled service providers can only attend to eight per cent of pregnant women. One way to address the problem of retention and recruitment is through the creation of skills training labs, capable of enhancing procedural techniques by enabling competent clinical faculty to train others.

In May 2006, as part of the Bethune Round Table, the University of Toronto Surgical Skills Centre hosted a workshop dedicated to Surgical Education for Africa. Led by Dr. Milliard De brew from the Addis Ababa University, 10 surgeons from developing countries participated, answering the question: *What are the most significant obstacles that prevent the creation and implementation of a surgical skills lab in your country?*

THREE THEMES EMERGED:

1. Lack of motivation
2. Insufficient funding
3. Shortage of resources

To address the issue, members of the Surgical Skills Centre, including manager Lisa Satterthwaite, researcher Dr. Adam Dubrowski and Katie Dorman, a long-time University of Waterloo co-op student in the Lab, went to promote and motivate the team in Ethiopia.

In September 2006, Katie arrived in Addis Ababa and conducted an informal needs assessment, delivered a presentation to surgical faculty and residents at the Black Lion Hospital and started preparing for the exam and training session. Joined by Lisa and Dr. Dubrowski, the team oversaw a research project on teaching surgical skills in the laboratory setting in Ethiopia.

From this project the team gained enough data to substantiate research in education papers as well as an article titled **The Case for Surgical Skills Centres in Sub Saharan Africa: The Benefits and the Challenges**, published in the *East and Central African Journal of Surgery* in April 2007.

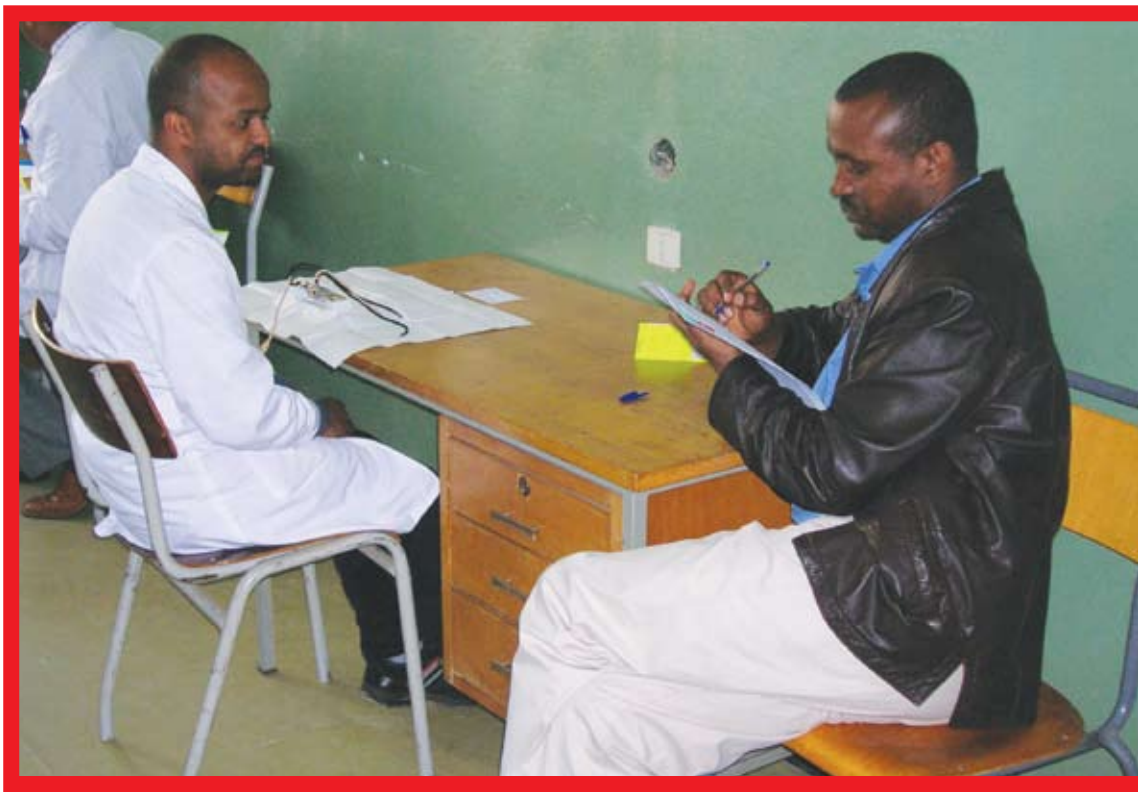
All of these efforts will help profile Ethiopia as an important epicenter for surgical education. University of Addis Abba faculty and residents were all encouraged by our presence to pursue greater opportunities in both the teaching and learning of surgical skills. As a result of our efforts we will maintain a productive relationship with this group and support them with self-sustaining projects and research opportunities.

To bring the Lab full circle, Konjit Fekade, a nurse from Black Lion Hospital came to study at the University of Toronto's lab for three months from October 2007 to January 2008 and will take knowledge on how to run a Surgical Skills Centre, back to Ethiopia.

Katie Dorman
Co-op Student,
Surgical Skills Centre

As an Honours Science Co-op student at the University of Waterloo, I have worked full-time at the Surgical Skills Centre for four four-month work terms. My role at the SSC has involved a broad range of activities, from filming and editing Core Curriculum training videos to contributing to the on-going research, offering me valuable insight into the research world and a number of medical professions.

Most significantly, working at the SSC opened the door to an unforgettable two months I spent in Ethiopia.



I lived and volunteered at the Black Lion Hospital in Addis Ababa, where I worked with a team of surgeons and nurses in the early development of their surgical training lab. After introducing the concept of surgical lab training through a series of short presentations, I worked with both the Addis and Toronto teams in preparing a miniature Objective Structured Assessment of Technical Skills for the surgical residents at Addis Ababa University. This exam was a success in collecting data on resident performance and introducing this type of evaluation to the surgical residents and staff.

Beyond the lab project, I spent time in the operating room and was exposed to a wide range of unfamiliar surgical cases. The wards were the saddest and most memorable part of my time at the Black Lion Hospital, especially the personal interactions I had with patients and their families.

During my stay in Ethiopia, I formed a number of unique and lasting relationships. Konjit Fekade, an OR nurse and manager of the new surgical training lab at the Hospital, was a helpful colleague and true friend during my stay.

Overall, volunteering in Ethiopia provided invaluable personal growth and the team at the Surgical Skills Centre played an integral role in my experience.

Konjit Fekade
RN, Black Lion Hospital

"After working in the operating theatre at the Black Lion Hospital in Addis Ababa for six years, I was awarded the wonderful opportunity of managing the new Surgical Skills Centre for Addis Ababa University.

I obtained my nursing diploma in 2001 from the Salam Nursing College and I am currently completing university courses in business and management. This endeavor has been both exciting and challenging and I have learned a lot about surgical education throughout the process. I am grateful for the time I have spent at the Surgical Skills Centre, where I've worked with a strong team of mentors for three months.

Beyond advancing my knowledge of surgical laboratory training, I've formed invaluable relationships with the staff, volunteers, and co-op students. I'd like to thank Lisa Satterthwaite and her team for making my visit to Canada an invaluable experience and for making my transition to this country so easy. I truly believe in the significant impact this project will have on the future of surgical training in Ethiopia."

VISITORS

Each year, we have visitors from around the world. These guests bring a wide range of ideas – both for surgical procedures and for our Surgical Skills Centre – and in turn, we offer them a unique educational experience and often the tools they need to start or maintain their own lab.

Some of our visitors this year, were:

Mesfin Minass, Black Lion Hospital, Addis Ababa, Ethiopia

Professor James Garden, Regius Professor of Clinical Surgery, University of Edinburgh, Scotland

ESC Corporation, University of Ottawa group

Dr. Depak Dath, Hamilton, Ontario

Dr. Haga-Surgeon, Director, Ministry of Health, Labour and Welfare in the Kyushu province, Japan

Dr. Bernard Vermeulen, Switzerland

Dr. Sineal Dut, Dubai

Dr. Phyu, Burma

Dr. Gordon Allan, Ortho Program, Director from Southern Illinois University's Surgical Skills Lab

Dr. Shariq Khoja, Pakistan

Dr. Michael Stark, President of the New European Surgeons Academy, Germany

Ms. Lucy Rebelo, Lab coordinator, Faculty Health Science Patient Simulation Lab, Kingston, Ontario

Harry Getz from Barro, California

Dr. Mittaw Oz, Cardiac surgeon from Columbia, USA (of Oprah Winfrey show fame!)

Melinda Taylor, Simulation Operations Engineer, Worcester, MA

Mark R. Halladay, Director, Base Hospital Program for Southeastern Ontario

Abby Suberman, Office of Strategy, New York Presbyterian Hospital

Dr. Gladys Tse, Washington University

Dr. Jeff Marks, Assistant Professor, Department of Surgery, Case Western Reserve University School of Medicine, Cleveland, Ohio

Dr. Stephen M. Cohn, Professor and Chairman, University of Texas Health Science Center, San Antonio, Texas

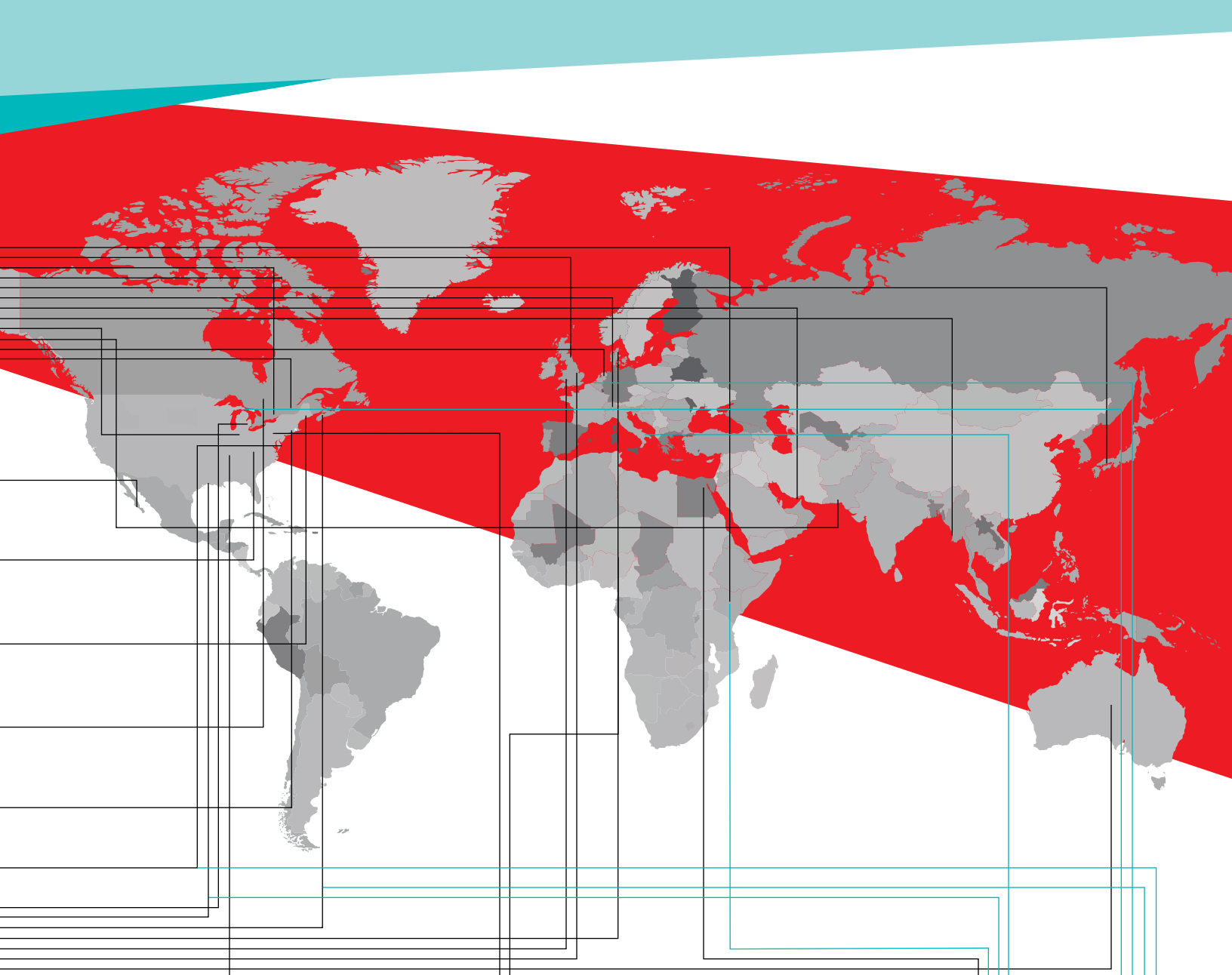
Michelle Murray, Halifax

Dr. Peter Funch-Jensen, Aarhus University Hospital, Denmark

Dr. Alison Waghorn, Liverpool, England

Dr. Meryl Davis, Fellow in Vascular and Endovascular Surgery at Guy's and St Thomas' Hospital in London, UK

Mr. Rick McLean, Medical Advisor for the Australian Government



Jette Led Sorensen, Consultant Obstetrician-Gynaecologist, Copenhagen, Denmark

Gregory Coleman, Surgical Skills Lab Coordinator, Guthrie Healthcare Services, Sayre, Pennsylvania

Steven M. Strasberg, Departmental Teaching Co-ordinator and Pruett Professor of Surgery, Washington University in St. Louis

Dr. Negm, Secretary General of the General Organization for Teaching, Hospitals and Institutes in Egypt

WHERE HAVE WE BEEN?

ADDIS ABABA, ETHIOPIA Development of a new surgical training lab

CLEVELAND, OHIO US Research on the impact of skill training for junior residents

PRATO, ITALY OSATS workshop *Putting it all Together*

MICHIGAN, US *Simulation Technology and its Emerging Role in Medical Technology*

GRONIGEN, HOLLAND Consultation on the development of a new Surgical Skills Training Lab

HALIFAX, NOVA SCOTIA Skills Lab development consultation

WASHINGTON, DC, US Models and Simulators in Surgical Education

SUPPORTERS

The Surgical Skills Centre is fortunate to have partnerships throughout the community who have helped fuel our success. Thank you.

Anspach

Codman

The D. H. Gales Family Foundation

Innova

Leica

Linvatec Canada

Medtronics

RBC Financial

Smith & Nephew

Sorin Group Canada Inc.

St. Judes Medical Canada Inc.

Stryker Canada

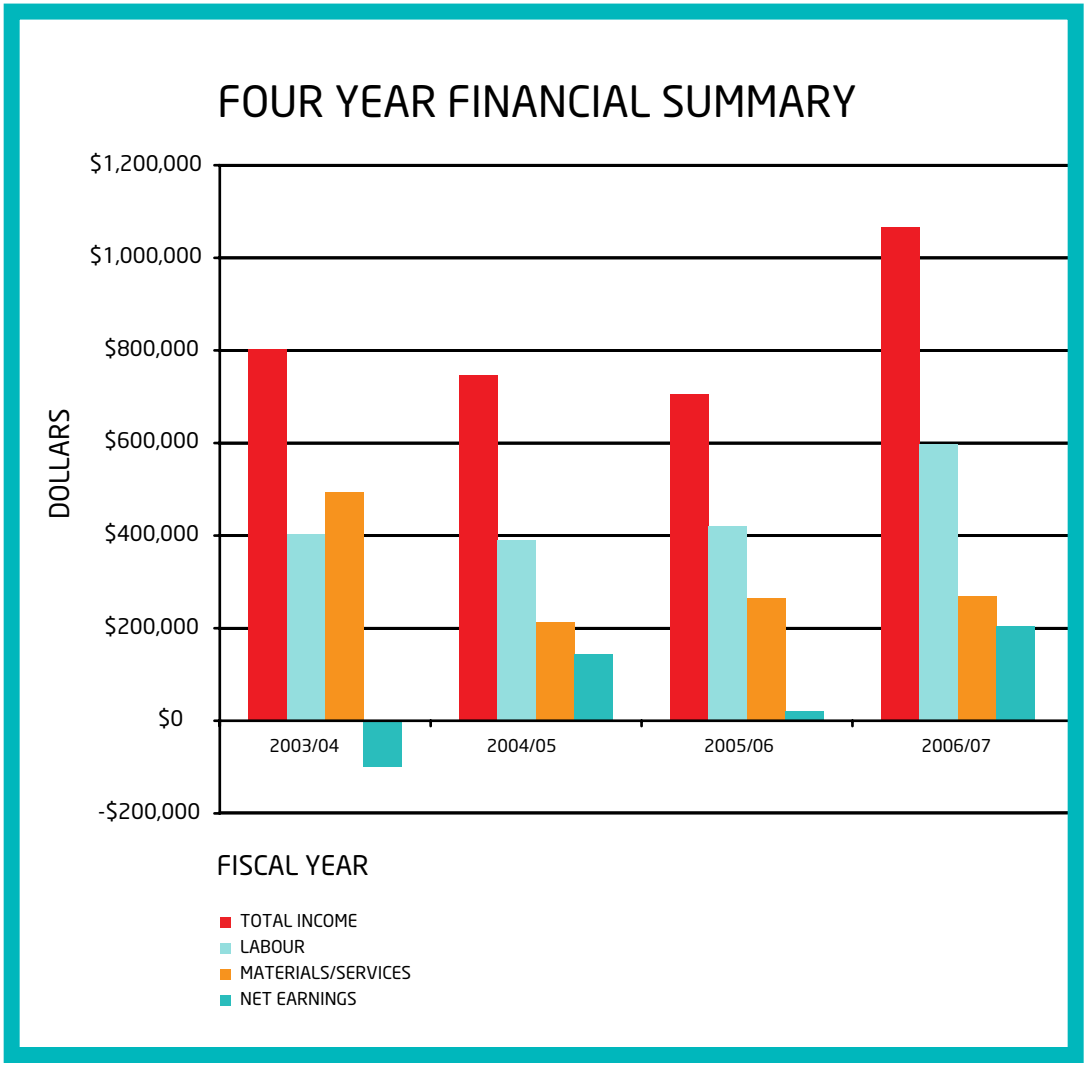
Synthes

Tyco Healthcare Group Canada

Vantage

Zeiss

Zimmer of Canada Ltd.



Continuity gives us **roots**;

Change

gives us **branches**,

letting us stretch and
grow and **reach new heights**

- Pauline R. Kezer

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