Monday June 12th
MaRS Building, Lower Concourse
101 College St. Toronto Ontario

ACCREDITATION
Royal College of Physicians and Surgeons of Canada – Section 1:
This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada, approved by Continuing Professional Development, Faculty of Medicine, University of Toronto up to a maximum of (6.5 hours)

Welcome to SpineFEST 2017
THE University of Toronto Spine Program Faculty

UHN-Toronto Western Hospital

W Mark Erwin PhD DC
Michael G. Fehlings MD PhD FRCSC FACS FCAHS FRSC
Stephen Lewis MD MSc FRCSC
Eric Massicotte MD MSc FRCSC
Y Raja Rampersaud MD FRCSC
Alexander Velumian PhD

UHN-Toronto Rehabilitation Institute

Karl Zabjek BSc MSc PhD

UHN-Techna

Margarete Akens Dr med vet PhD

Sunnybrook Health Sciences Centre

Leo da Costa MD
Mahmood Fazli MD FRCSC
Joel Finkelstein MD MSc FRCSC
Michael H. Ford MD FRCSC
Barry W. Malcolm MD FRCSC MBA
Meaghan O’Reilly PhD
Farhad Pirouzmand MD MSc FRCSC
Arjun Sahgal BSc MD FRCPC
Victor Yang MD PhD PEng FRCSC
Cari Whyne PhD
Albert Yee MD MSc FRCSC

Hospital for Sick Children

James Drake BSE MB BCh MSc FRCSC
Reinhard Zeller MD FRCSC

St. Michael’s Hospital

Jefferson Wilson MD, PhD FRCSC
Henry Ahn MD PhD
Howard Ginsberg MD PhD FRCSC

Mount Sinai Hospital

Carlo Ammendolia DC PhD CCRF
Rita Kandel MD FRCPC

University of Toronto

Cindi M Morshead BSc PhD
Molly S Shoichet PhD FRSC

THE U of T Spine Program

is a combined neurosurgery and orthopaedic surgery program integrated across citywide clinical and research programs at the affiliated teaching hospitals: University Health Network (UHN), Sunnybrook Health Sciences Centre (SHSC), Hospital for Sick Children (HSC), St. Michael’s Hospital (SMH), and Mount Sinai Hospital (MSH)
Colleagues

This year the University of Toronto Department of Surgery Spine Program celebrates its 9th annual SpineFEST meeting. It has been a productive academic year as our program continues to foster important city-wide collaborations within the university as well as participate and lead on several key regional and international initiatives.

As a program, we benefit from the ongoing strong support of our University Department of Surgery, and Divisions of Neurosurgery and Orthopaedics. We value the clinical, research and education expertise of our city-wide faculty and trainees in support of our important Program Council, Research and Education Committee activities. Key collaborators from spine community and industry also continue to help nurture growth in our academic program.

In Fall 2016 the Program, in collaboration with the Krembil Neuroscience Centre, celebrated the 15th anniversary of the Tator-Turnbull Lectureship as we had an interesting and rather inspiring lecture by our visiting professor Dr Clas Hultling from the Karolinska Institute. Dr Hultling himself is a quadriplegic as well as an innovative rehabilitation physician and researcher. The Symposium was particular special highlighted by a moving tribute to Barbara Turnbull with a formal dedication of one of the spinal cord injury lab investigator offices, that belonging to Dr Charles Tator, in Barbara’s name. Dr Hultling also engaged us in stimulating discussions in our U of T GTA Spine Rounds; he shared with us his extraordinary passion for an extraordinary, yet a challenged life. This May, we have partnered with the Ontario Neurotrauma Foundation, Canadian Spinal Cord and Ontario Spinal Cord Injury groups to hold a successful combined meeting of clinical and pre-clinical research updates relating to spinal cord injury patient care.

In education and teaching, we have had an active year which continues to focus on excellence in fellowship and resident education. We held our third annual joint city-wide Orthopaedics & Neurosurgery Royal College of Physician and Surgeon’s of Canada (RCPSC) Mock Oral Prep Course for senior university resident trainees. In particular, we acknowledge the significant contributions to the success of this meeting by our city-wide spine fellows, led by Drs. Jean-Christophe Murray, Kyle Stampe, and Mario Ganau. Their time in preparation of the cases as well as valuable practical tips was well received by the residents. At the fellowship level, selective rotation/observership opportunities have been offered to incoming fellows over the past years, with some fellows choosing to pursue this added educational offering. Our fellowship education working group has initiated a successful two-year fellowship pilot with a second year focused on subspecialty areas of spine surgery. This opportunity builds upon competencies that may be acquired during a general first fellowship year, followed by a second year catered to advanced/focused competencies. This is also complemented by our city-wide fellow surgical case-log program that is also based upon our national training competencies. Our Journal club has been accredited by the Royal College of Physi
Spinal Stenosis Study which has achieved the enrollment target. The study is to examine the improvement of walking in patients who undergone a comprehensive program including a twice-a-week therapy. On the side of Metastatic Tumor Research, the Epidemiology, Process and Outcomes of Spine Oncology (EPOSO), is set to determine the efficacy of surgery versus radiotherapy for the treatment of impending instability secondary to metastatic disease of the spine. SHSC and TWH have been high accruing centers for EPOSO and recruitment is near closing.

In patient care advocacy and global efforts, Drs. Yee and Fehlings are working with AO Spine North America to more broadly disseminate knowledge gained from our national competence based training education efforts with a recent manuscript submitted for publication. In similar perspective, the Program co-hosted an international annual meeting with the Cervical Spine Research Society (CSRS) in Nov/Dec last year in Toronto with excellent representation from our program and local spine community. In a productive platform on the side of the CSRS meeting, we also partnered with AO Spine International and Rick Hansen Institute to move forward with dissemination of the Guidelines we have developed in the past couple of years for Acute Spinal Cord Injury (ASCI) and Cervical Spondylotic Myelopathy (CSM). This comes as an initiative to enhance quality of care by establishing clinical protocols for the management of patients with...
ASCI, and aid clinicians in evidence-based decision making based on recommendations for important and controversial areas of ASCI management. Interestingly, our “Time is Spine” concept, in which we emphasize early surgical decompression to improve outcomes from spinal cord injuries, has been highlighted by the Spine Summit and Spine Universe, supported as AOSpine guidelines, and is being considered for teaching as AO principle. Our program continues each year to draw the Scoliosis Research Society traveling fellows award winners. This year we hosted Dr. Tushar Rathod as he spent his SRS Globus Medical Fellowship at TWH and SickKids; we will also be hosting an additional SRS award winner this November. We are very excited about hosting the Neurotrauma2018 Symposium in Toronto August 11-16, 2018 at the Westin Harbour Castle Hotel. We are also looking forward to hosting the 2019 Global Spine Congress in Toronto during Spring 2019; this is a vibrant international spine conference which is anticipated to attract over 1500 delegates.

We are also proud of recent University Department announcements this year. Dr. Raj Rampersaud (TWH) was promoted to the rank of Full Professor in the Department of Surgery. This is a testament to his international reputation in evaluative studies on spine surgery outcomes, patient advocacy, and transformational efforts improving the model of care delivery for patients. Dr. Victor Yang (Sunnybrook) was also the recognized at our annual Department of Surgery Gallie Day as the award recipient of the George Armstrong-Peters Prize, which is awarded to a young investigator within 5 years of university appointment who has shown outstanding productivity during his/her initial period as an independent investigator as evidenced by research publications in peer reviewed journals, grants held, and students trained.

On December 4, 2017 we will be conducting our Strategic Planning retreat and we are pleased to invite our program faculty and trainees to this meeting. The retreat will inform the strategic directions for our program over the next 3 years with focus on three themes which are central to the mission of the UofT Spine Program: fellowship and training; integration of clinical care with enhancement of clinical programs, and inter-institutional translational research.

In closing, we would like to thank all our program members and partners for their support over the years. We are privileged to benefit from the diverse and specialized expertise of our program members. We also thank Ms. Nadia Jaber, our program coordinator who has been instrumental in moving forward our collaborative agenda.

We are very excited about our SpineFEST keynote speaker Professor Zoher Ghogawala from Tufts University School of Medicine. He is a world renowned neurosurgeon, researcher, and engaging speaker. We invite you all to join us in welcoming Dr. Ghogawala and learn more about “The search for Truth in Spinal Surgery”.

Sincerely,

Michael & Albert
7:00  Breakfast & Registration

7:30  INTRODUCTION

Opening Remarks
Professor Michael Fehlings & Professor Albert Yee
Co-Directors, University of Toronto Department of Surgery Spine Program

Greetings from the University of Toronto
Professor Robin Richards
Vice Chair, Clinical, Department of Surgery
Professor Peter Ferguson
Albert and Temmy Latner Chair, Division of Orthopaedic Surgery

Welcome Remarks
Dr Charles Tator & Dr Hamilton Hall

THE TATOR-HALL VISITING PROFESSOR LECTURE (chair: Dr Michael Fehlings)

8:00  Introduction of Visiting Professor Dr Zoher Ghogawala
Professor Michael Fehlings

8:15  Keynote Address
THE SEARCH FOR TRUTH IN SPINAL SURGERY
Visiting Lecturer: Zoher Ghogawala MD FACS, Professor of Neurosurgery at Tufts University School of Medicine

9:00  Discussions (15 Minutes)

9:15 to 9:30  Coffee Break

SESSION I: VALUE-BASED SPINE SURGERY AND SPINE QUALITY (Chair: Dr Stephen Lewis)

9:30  COST UTILITY ANALYSIS EVALUATING SURGICAL VS. NON-SURGICAL TREATMENT FOR TYPE 2 GERIATRIC ODONTOID FRACTURES
New Faculty: Jefferson Wilson MD PhD FACSC

9:45  COST EFFECTIVENESS SURGERY FOR DEGENERATIVE CERVICAL MYELOPATHY
Michael G. Fehlings MD PhD FACSC FACS
10:00  COST EFFECTIVENESS SURGERY FOR LUMBAR SPINAL STENOSIS  
Y. Raja Rampersaud MD FRCS

10:15  COST EFFECTIVENESS TREATMENT INTERVENTIONS FOR THE ELDERLY SPINAL CORD INJURY  
Julio Furlan MD MBA MSc PhD FRCPC

10:30  Discussions (15 Minutes)

10:45 to 12:15  E-Poster Presentations & Judging (Chair: Dr Cari Whyne)

12:15 to 13:00  Lunch and e-Poster Viewing

SESSION II: CLINICAL TRIALS/OUTCOME MEASURES IN SPINE SURGERY (Chair: Dr Albert Yee)

13:00  GOING THE DISTANCE. A RANDOMIZED CONTROLLED STUDY EVALUATING A NOVEL NON OPERATIVE APPROACH TO IMPROVE WALKING ABILITY IN NEUROGENIC CLAUDICATION DUE TO DEGENERATIVE LUMBAR SPINAL STENOSIS  
Carlo Ammendolia DC PhD

13:15  DECIPHERING THE TRUTH IN SPINAL SURGERY OUTCOME MEASUREMENT  
Joel Finkelstein MD MSc FRCSC

13:30  IMPROVING OUTCOMES - ITS MORE THAN OUR TECHNIQUES AND GADGETS?  
Henry Ahn MD PhD FRCS

13:45  Discussions - Panel: session speakers and Dr Ghogawala (30 Minutes)

14:15 to 14:30  Coffee Break

SESSION III: RESEARCH TRAINEE PRESENTATIONS (Chair: Dr Henry Ahn)

A: INVITED PRESENTATIONS

14:30  MOVING QUANTITATIVE MRI OF THE SPINAL CORD INTO CLINICAL USE FOR DIAGNOSIS, MONITORING OF PROGRESSION, AND PREDICTION OF OUTCOMES IN DEGENERATIVE CERVICAL MYELOPATHY  
Allan Martin BASc MD (PGY4 Neurosurgery)

14:40  OPIOID-USE IN LOW BACK PAIN: PATIENT CHARACTERISTICS, OUTCOMES AND COSTS  
Eric Crawford BHSc MD MScC (PGY4 Orthopaedic Surgery)

U of T Spine Program

5
14:50 Discussions (10 Minutes)

B: ORAL PRESENTATIONS

15:00 LIFETIME INCREMENTAL COST-UTILITY RATIOS FOR MINIMALLY INVASIVE SURGERY FOR DEGENERATIVE LUMBAR Spondylolisthesis COMPARED TOTAL HIP and KNEE ARTHROPLASTY FOR OSTEOARTHRITIS

Best Abstract (clinical) tie: Robert Ravinsky MD (PGY5 Orthopaedic Surgery)

15:10 ANTERIOR CERVICAL DISCECTOMY and FUSION VERSUS POSTERIOR CERVICAL FORAMINOTOMY FOR CERVICAL RADICULOPATHY: UTILIZATION, COSTS and ADVERSE EVENTS

Best Abstract (clinical) tie: Christopher Witiw MD (PGY5 Neurosurgery)

15:20 CHONDROITINASE ABC PRETREATMENT ENHANCES FUNCTIONAL REPAIR OF THE CHRONICALLY INJURED CERVICAL SPINAL CORD by INDUCED PLURIPOTENT STEM CELL DERIVED NEURAL STEM CELLS

Best Abstract (Basic Science): Christopher Ahuja MD (PGY4 Neurosurgery)

15:30 Discussions (10 Minutes)

AWARDS PRESENTATION and CLOSING REMARKS

15:40 Award Presentations and Closing Remarks
Dr Michael Fehlings & Dr Albert Yee (Co-Directors, U of T Spine Program)
Dr Zoher Ghogawala serves as the Charles A. Fager Chair of Neurosurgery at Lahey Hospital and Medical Center and is Professor of Neurosurgery at Tufts University School of Medicine. He is active in the surgical treatment of patients with disorders of the spine, carotid vascular disease and pituitary brain tumors. His research focuses on comparative effectiveness, cost-effectiveness, and neurosurgical outcomes, exploring the effectiveness, benefits and sometimes harmful results of different treatment options. He was the principal investigator the recently completed national, externally funded SLIP study, a randomized clinical trial that compared fusion versus no fusion following spinal decompression. This study was published in New England Journal of Medicine. Dr. Ghogawala has recently received NIH and PCORI funding support to conduct a multi-center prospective RCT that aims to compare ventral versus dorsal surgery options for cervical spondylotic myelopathy (CSM-S Trial). Dr. Ghogawala recently edited and published a textbook entitled, “The Evidence for Neurosurgery” as well as co-authored the newly updated Lumbar Fusion Guidelines. Dr. Ghogawala has recently served as the Vice-President of the Congress of Neurological Surgeons and is active on the executive committee for AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves. He is the current Chair of the Research Committee for the Cervical Spine Research Society. He has recently served as the Scientific Program Chair for the Cervical Spine Research Society Meeting and is also currently the Past Annual Program Chair for the 2016 Spine Section Meeting. He is also on the Board of Directors of the North American Spine Society (NASS) and the Cervical Spine Research Society. Dr. Ghogawala completed his undergraduate degree magna cum laude at Harvard University, and graduated from Harvard Medical School with high honors in 1991. He completed his residency training in neurological surgery at Massachusetts General Hospital.
Dr Charles Tator is a Professor in the Department of Surgery, at the University of Toronto, and a neurosurgeon at the Toronto Western Hospital. He is the former Chair of Neurosurgery at the University of Toronto. He started the first Acute Spinal Cord Injury Unit in Canada in 1974, and has reported on the epidemiology, prevention and treatment of spinal cord injury. He has undertaken seminal translational and clinical research in spinal cord injury. In 1992, he founded ThinkFirst, Canada, a national brain and spinal cord injury foundation whose mission is to reduce the incidence of catastrophic injuries in Canada. In 2012, ThinkFirst merged with three other charities to form Parachute Canada, the country’s foremost injury prevention agency, of which he is a founding Director.

In 2008, the University of Toronto Press published his book “Catastrophic Injuries in Sports and Recreation, Causes and Prevention—a Canadian Study.” He has held two research chairs at the University of Toronto, the Dan Family Chair in Neurosurgery and the Campeau Family-Charles Tator Chair in Brain and Spinal Cord Research. In 2000, he received the Order of Canada, and in 2009 he was inducted into the Canadian Medical Hall of Fame. In 2017, he was promoted to Officer within the Order of Canada, and was also inducted into Canada’s Sports Hall of Fame for his work on prevention of sports injuries.

Dr Hamilton Hall is a Professor in the Department of Surgery at the University of Toronto (U of T), and on the active orthopaedic staff at the Sunnybrook Health Sciences Centre. In 1974 Dr Hall founded the Canadian Back Institute (CBI Health Group), now the largest rehabilitation company in Canada. Dr Hall continues to serve as its Medical Director. He is co-founder of the Canadian Spine Society and is presently the Society’s Executive Director. Dr Hall is a member of the North American Spine Society, the Canadian Orthopaedic Association and the International Society for the Study of the Lumbar Spine. He has served on the editorial boards of Spine, The Spine Journal and The BackLetter. Honours include the Laurie Chute Award for the best undergraduate clinical lecturer at the U of T and the Henry Farfan Award from the North American Spine Society for outstanding contributions to the field of spine care. Dr Hall’s concept of a syndrome approach to mechanical back pain is an essential component of the provincial initiatives to educate primary care providers in British Columbia, Alberta, Saskatchewan, Ontario, New Brunswick and Nova Scotia. His system is the basis of undergraduate teaching about back pain in the Faculties of Medicine at the U of T and McMaster University. In addition to over 130 published articles and book chapters and over 1200 invited presentations, many as Visiting Professor at universities in North America, Europe and Asia, Dr Hall is the author of the best-selling Back Doctor series of books for the lay public.
Dr Jefferson Wilson entered the neurosurgery program at University of Toronto after completing his MD at the University of Saskatchewan in 2007. During residency he earned a PhD through IMS and the Surgeon Scientist Program under the mentorship of Michael Fehlings and Abhaya Kulkarni with his research focused on the epidemiology and clinical epidemiology of traumatic spinal cord injury. Jeff’s research has been funded by multiple grants from the Christopher and Dana Reeve Foundation, Cervical Spine Research Society and the Ontario Neurotrauma Foundation; further, he has been the recipient of numerous prestigious awards including: the K.G. McKenzie Prize from the Canadian Federation of Neurological Sciences, the Synthes Spinal Cord Injury Award from the American Association of Neurological Surgeon and the Shafie S. Fazel Outstanding Resident Surgeon and Investigator Award from the U of T Department of Surgery. After obtaining his FRCSC in neurosurgery in 2015, Jeff undertook a combined neurosurgery orthopedic fellowship in complex spine surgery at Thomas Jefferson University in Philadelphia, PA under the mentorship of James Harrop and Alex Vaccaro. Jeff returns to Toronto as a Surgeon Scientist at St. Michael’s Hospital with clinical focus on the full spectrum of spinal disorders. From a research perspective, he is primarily interested in topics related to the epidemiology and clinical epidemiology of spinal trauma and spinal cord injury. Currently he serves as the Deputy Editor of the journal Clinical Spine Surgery.
Dr Allan Martin is a PGY4 Neurosurgery Resident currently enrolled in the Institute of Medical Science PhD program under Dr. Michael Fehlings. His research focus is in microstructural spinal cord MRI techniques to quantify tissue injury, with the goal of moving these techniques closer toward clinical translation. Allan is also involved in several other clinical research projects including a pilot study of deep brain stimulation (DBS) to improve locomotion in patients with chronic spinal cord injury. He originally trained in Engineering Science and worked for IBM Canada for almost 10 years, achieving 9 patents as inventor. Allan spends most of his free time with his wife Kirsten and 3 children, Zia (9), Scarlett (7), and Leo (5), but also enjoys running, skiing, snowboarding, sailing, playing music (bass, drums), and home improvement.

Dr Eric Crawford is a fourth year resident in the Division of Orthopaedic Surgery, who is currently enrolled in the Surgeon Scientist Training Program and the Clinician Investigator Program. Eric completed his undergraduate degree in Health Sciences at Western University and received his Doctor of Medicine from the University of Toronto. He is currently pursuing a Master of Science degree in Clinical Epidemiology and Health Care Research in the Institute of Health Policy Management and Evaluation at the University of Toronto. His research focuses on health economic evaluations of clinical care pathways in orthopaedic surgery. He is grateful to be a part of the Toronto Orthopaedics Program and greatly appreciates the Faculty’s support with respect to his research endeavours. Eric is indebted to his wife Joanna, for her ongoing patience, support and encouragement, and enjoys spending as much time as possible with their one-year old son Cameron and dog, Ricky. After residency, Eric has plans to complete a spine surgery fellowship at Sunnybrook Health Sciences Centre.
Dr. Robert Ravinsky is a fifth, and final year resident in Orthopaedic Surgery at the University of Toronto. Originally from Montreal, Quebec, he completed first a bachelor of science in physiology, followed by a medical doctorate at McGill University. Additionally, Rob has completed his Master of Public Health, concentrated in quantitative methods, at Harvard University. Upon graduation at the end of June, he plans to continue his training in spinal surgery under the supervision of Drs. Michael Fehlings, Stephen Lewis, Eric Massicotte, and Raj Rampersaud at Toronto Western Hospital. The subsequent year, he will be pursuing a second fellowship in spine surgery at Cedars-Sinai Medical Center in Los Angeles, California.

Rob would like to thank all his mentors in Toronto for their ongoing guidance throughout his years of training, as well as his wife, Meredith, and his cat, Leonard, for their unwavering love and support.

Dr. Christopher Witw is a fifth-year Neurosurgery Resident at the University of Toronto. He has a strong interest in value based care and patient centered outcomes research in spine surgery. He received a Canadian Institutes of Health Research Fellowship award in 2015 and spent his fourth year of residency in Chicago obtaining a graduate degree in Health Economics at the University of Chicago. He has published numerous articles in peer-reviewed neurosurgical journals and won several awards including the 2016 North American Spine Society Outstanding Paper Award for his research on the cost utility of surgery for Degenerative Cervical Myelopathy. Upon completion of residency in 2018, Chris will spend one year at Rush University Medical Center as a clinical fellow in Complex and Minimally Invasive Spinal Neurosurgery.
Dr Christopher S Ahuja is a 2nd year PhD student studying novel neural stem cell therapies for traumatic spinal cord injury in the lab of Dr. Michael Fehlings at UHN. He completed his medical training at Queen’s University in Kingston before joining the Division of Neurosurgery at the University of Toronto where he is currently a 4th year resident. His ongoing work focuses on strategies to modify the acute and chronic post-injury extracellular matrix to generate an environment that is more conducive to cell-based regeneration.
Anick Nater, Lindsay Tetreault, Branko Kopjar, Paul Arnold, Mark Dekutoski, Joel Finkelstein, Charles Fisher, John France, Zia Gokaslan, Laurence Rhines, Paul Rose, Arjun Sahgal, James Schuster, Alexander Vaccaro, Michael Fehlings

**Predictive factors for survival in surgical series of symptomatic metastatic epidural spinal cord compression: A prospective North American multi-centre study in 142 patients**

Anick Nater, JC, Murray, Lindsay Tetreault L, Allan Martin, Aria Nouri, Michael Fehlings

**Clinical Practice Guideline in Managing Perioperative Neurologic Deficits: Results from a Survey of the AOSpine International Community**

Anna Badner, Justin Hacker, James Hong, Miriam Mikhail, Michael Fehlings

**The spleen is an important site of mesenchymal stromal-cell mediated immunomodulation following traumatic spinal cord injury**

Antigona Ulndreaie, Pia Vidal, Michael Fehlings

**Lack of IgM immunoglobulins deteriorates the outcome of spinal cord injury in the chronic phase**

Daipayan Guha, Raphael Jakubovic, Shaurya Gupta, Todd G. Mainprize, Michael G. Fehlings, Albert Yee, Victor XD Yang

**Optical Topographic Imaging for Spinal Intra-Operative Three-Dimensional Navigation in Minimally-Invasive Approaches: Initial Pre-Clinical and Clinical Feasibility**

Daipayan Guha, Raphael Jakubovic, Shaurya Gupta, Michael G. Fehlings, Albert Yee, Victor XD Yang

**Optical Topographic Imaging for Intra-Operative Three-Dimensional Navigation in the Cervical Spine: Accuracy Validation and Initial Clinical Feasibility**

Jean-Christophe Murray, Neil Manson, Greg McIntosh, Ken Thomas, Hamilton Hall, Charles Fisher, Raja Rampersaud

**The Impact of Degenerative Spinal Disorders on the Quality of Life of Patient Undergoing Spine Surgery in Canada: A National Comparison to Normal Peers.**

Jonathon Chio, Jian Wang, Anna Badner, James Hong, Michael Fehlings

**Immunomodulatory Effects of Intravenous Immunoglobulin G on Neuroinflammation after Cervical Spinal Cord Injury**
Kajana Satkunendrarajah, Spyridon Karadimas, Senthgavy Sivakumar, Patricia Samson, Michael Fehlings

Respiratory plasticity via cervical glutamatergic interneurons preserves breathing after cervical spinal cord injury

Kunal Bhanot, Gary Rosenberg, Albert Yee

Single-level lumbar spine microdiscectomy surgery: Clinical practice variation in disclosure of risks and complications during the informed consent process

M Khazaei, N Nagoshi, H Nakashima, C Ahuja, L Li, A Badner, J Chio, M Fehlings

Human iPSC derived neural progenitor cells engineered to secrete GDNF show enhanced survival, neuronal differentiation and improve functional recovery after spinal cord injury

Majed Alghamdi, Mikki Campbell, Hany Soliman, Sten Myrehaug, Mark Ruschin, Young K. Lee, Eshetu Atenafu, Arjun Sahgal, Chia-Lin Tseng

Imaging-Based Outcomes for 24 Gy in 2 Daily Fractions for Patients with De Novo Spinal Metastases Treated with Spine Stereotactic Body Radiotherapy (SBRT): An Emerging Standard

Mathew R. Voisin, Christopher D. Witiw, Ryan Deorajh, Adetunji Oremakinde, Shelly Wang

Soft tissue preserving direct multilevel pars repair using the ‘Smiley Face’ technique with 3D optical imaging based intra-operative spinal navigation

Mitchell T. Caprelli, Andrea J. Mothe, Charles H. Tator

Characterizing Tau Hyperphosphorylation Following Traumatic Spinal Cord Injury: A Histological Marker of Axonal Injury

Pia Vidal, Antigona Ulndreaaj, Michael Fehlings

Methylprednisolone treatment enhances early recovery following surgical decompression for degenerative cervical myelopathy without compromise of the peripheral immune system

Rachel Dragas, James Hong, Ahad Siddiqui, Michael Fehlings

A Combinatorial Strategy for Reducing Astrocyte Reactivity Using Neural Progenitor Cells and Hepatocyte Growth Factor
e-Poster Presentations

Cont’d

Rahul Gawri, Weiqiang Wu, Justin Parreno, Rita Kandel

Saeid Samiezadeh, Hamid Ebrahimi, Frankie (Hoi-Ki) Tong1, Cari M Whyne


Incidence and Risk Factors of Post-operative Neurological Decline after Complex Adult Spinal Deformity Surgery: Results of the Scoli-RISK-1 Study

So Kato, Stephen J. Lewis, Sigurd H. Berven, Lawrence G. Lenke, Christopher I. Shaffrey, David W. Polly, Ahmet Alanay, Yong Qiu, Kenneth MC Cheung, Marinus De Kleuver, Manabu Ito, Niccole M. Germscheid

Preoperative Characteristics of Elderly Patients Enrolled in the Prospective Evaluation of Elderly Deformity Surgery: (PEEDS) Trial of Multilevel Spinal Fusion

Stewart McLachlin, Cari Whyne, Michael Hardisty Evaluation of Elderly Deformity Surgery: (PEEDS) Trial of Multilevel Spinal Fusion

Diffusion tensor imaging labeled spinal cord tracts in the cervical spine verified against T1 MRI

Tan Chen, Mohammed Obeidat, So Kato, Anupreet Bassi, Stephen Lewis

Late Atraumatic Fusion Mass Fractures Occurring Between Non-bridged Constructs in Patients Requiring Fusions Distal to AIS Fusions
The University of Toronto Spine Program gratefully acknowledges the continued support of the U of T Department of Surgery, Division of Orthopedic Surgery, and Division of Neurosurgery.

The Program also thanks Medtronic, DePuy Synthes, Ethicon, Stryker, and Zimmer Biomet for their continued support.

Donations to the University of Toronto Spine Program support educational events, research, clinical fellowship, and ongoing programmatic initiatives and efforts towards advances of spine care in Canada and worldwide.

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