



UNIVERSITY OF
CALGARY
SPINE PROGRAM

ANNUAL REPORT 2022-2023



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INTRODUCTION

The University of Calgary Spine Program is a multidisciplinary clinical and academic group focused on the care of individuals affected by conditions and diseases of the spine and spinal cord. Our mission is to provide the highest quality health care to individuals with spinal disorders through the pursuit of excellence in research, teaching, and clinical care.

The program is centered at the Foothills Medical Centre and Alberta Children's Hospital within Alberta Health Services. Members of the Spine Program have appointments in the Division of Neurosurgery, Department of Clinical Neurosciences or the Section of Orthopaedic Surgery, Department of Surgery. Many members have joint appointments in both Departments.

The Spine Program provides care for patients with spinal cord and column injury, infection, neoplasia and degenerative disease. Clinical care is closely linked to clinical education and research in a supportive academic setting. The program has representation from Neurological Surgery, Orthopaedic Surgery, Nursing, and Orthotics.

Active collaborations exist with physiatry and psychiatry. Our program has been able to achieve excellence across the spectrum of clinical care delivery, surgical education and research primarily because of the collaborative and collegial work environment that is well-established within our combined orthopaedic and neurosurgical program.

Our program offers comprehensive Spinal Surgery Fellowship training under the leadership of Dr. Fred Nicholls. The Spinal Surgery Fellowship at the University of Calgary is a combined Orthopaedic and Neurosurgical clinical experience with the goal of training surgeons in the diagnosis and surgical management of diseases of the entire spine.



DR.
BRADLEY
JACOBS

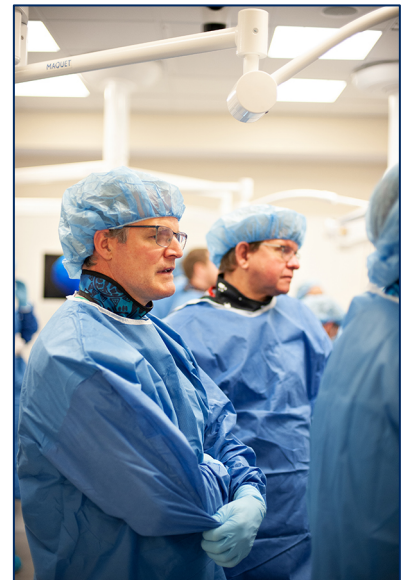
Program Chair



Our fellowship is recognized as an AOSpine North America designated fellowship training site, one of only 4 such sites in Canada and 35 in North America. Trainees gain experience in the surgical treatment of a wide array of conditions, ranging from common degenerative conditions to complex adult deformity and oncological surgical resections and reconstructions. Minimally invasive and anterior/anterolateral approaches are commonly employed in daily practice.

Dr. Ken Thomas leads our research program. There are currently numerous active research studies within the Spine Program that range from fundamental science experiments focused on intervertebral disc biology to advanced MR imaging and machine learning research to prospective randomized controlled clinical trials on acute spinal cord injury therapeutics. Basic science investigations are carried out via active collaborations with the McCaig Bone & Joint Research Institute and the Hotchkiss Brain Institute. Clinical research studies are active on many spinal surgery topics, with key activity focused on the Canadian Spine Outcomes & Research Network (CSORN) clinical registry.

This Annual Report represents a synopsis of our busy 2022-2023 academic year. Please enjoy!



MEMBERS

- **Surgical Staff**

- Dr. W. Bradley Jacobs, Program Chair
- Dr. Jacques Bouchard
- Dr. David Cadotte
- Dr. Steven Casha
- Dr. Roger Cho
- Dr. Stephan du Plessis
- Dr. Nathan Evaniew
- Dr. Fábio Ferri-de-Barros
- Dr. Richard Hu
- Dr. Peter Lewkonja
- Dr. Fred Nicholls, Fellowship Director
- Dr. David Parsons
- Dr. Alex Soroceanu
- Dr. Ganesh Swamy
- Dr. Ken Thomas, Research Director
- Dr. Michael Yang

- **Allied Health**

- Brooke Nowicki, Manager Clinical Neurosciences, Spine Program Operations Manager
- Ken Moghadam, Certified Orthotist (CO) Cascade Orthotics
- Rob Cameron, CO Cascade Orthotics
- Drew Anholt, CO Cascade Orthotics
- Jeff Wright, CO Cascade Orthotics

- **Nursing Staff**

- Chris Marsh, OR nurse clinician
- Natasha Tumack, OR nurse clinician

- **Nurse Practitioners**

- Patti Long, Neurosurgery
- Ron Prince, Neurosurgery
- Carla Dean, Orthopaedics
- Nicole Miller, Orthopaedics

- **Clinical Surgical Assistants**

- Dr. Khurram Khalid Elahi
- Dr. Mohammad Sadeghian



● Research Staff

- Tara Whittaker, Research Manager
- Ish Bains, Research Coordinator
- Saswati Tripathy, Research Coordinator
- Victoria Smith, Research Coordinator
- Manpreet Kaur, Research Coordinator

● Spine Fellows

- Dr. Alysa Almojuela
- Dr. Martin Gagliardi
- Dr. Addison Wood
- Dr. James Wu

● Neurosurgery Residents 2022-2023

- | | |
|--|--------------------------------|
| ○ Dr. Rita Nguyen (R6) | ○ Dr. Branavan Manoranjan (R4) |
| ○ Dr. David Ben-Israel (R6) | ○ Dr. Richard Yu (R4) |
| ○ Dr. Sandeep Muram (R6) | ○ Dr. Brij Karmur (R3) |
| ○ Dr. Nicholas Sader (R6) | ○ Dr. Catherine Veilleux (R3) |
| ○ Dr. Madeleine de Lotbiniere-Bassett (R5) | ○ Dr. Rena Far (R2) |
| ○ Dr. Matthew Eagles (R5) | ○ Dr. Runze Yang (R2) |
| ○ Dr. Abdulrahman Albakr (R5) | ○ Dr. Elizabeth Adam (R1) |
| ○ Dr. Jenna Mann (R4) | ○ Dr. Heather Rossong (R1) |

● Orthopaedic Residents 2022-2023

- | | |
|---------------------------------|---------------------------------|
| ○ Dr. Brent Benavides (R5) | ○ Dr. Julian Rizoz (R3) |
| ○ Dr. Taryn Ludwig (R5) | ○ Dr. Logan Woods (R3) |
| ○ Dr. Jayd Lukenchuk (R5) | ○ Dr. Manjot Birk (R2) |
| ○ Dr. Murray Wong (R5) | ○ Dr. Anna-Lee Policicchio (R2) |
| ○ Dr. Daniel You (R5) | ○ Dr. Brodie Ritchie (R2) |
| ○ Dr. Annalise Abbott (R4) | ○ Dr. Ethan Sanders (R2) |
| ○ Dr. Erin Davison (R4) | ○ Dr. Gareth Ryan (R2) |
| ○ Dr. Christopher Flanagan (R4) | ○ Dr. Stephanie Gibbon (R1) |
| ○ Dr. Bryan Heard (R4) | ○ Dr. Timothy Lasswell (R1) |
| ○ Dr. Christopher Hewison (R4) | ○ Dr. Michael Leslie (R1) |
| ○ Dr. Laurel Collings (R3) | ○ Dr. Kaja Matovinovic (R1) |
| ○ Dr. Jarrett Moore (R3) | ○ Dr. Meradith Stadnyk (R1) |
| ○ Dr. Laura Morrison (R3) | |

CLINICAL ACTIVITY

Surgical Sites

Foothills Medical Centre

The Foothills Medical Centre is a level 1 trauma center serving more than two million people from the City of Calgary and the surrounding regions of southern Alberta, southeastern British Columbia and southern Saskatchewan. Approximately 1800 spinal procedures are performed per year at Foothills Medical Centre. All adult spinal cord injuries are seen and managed in the acute and rehabilitation stages at the Foothills.

Alberta Children's Hospital

Alberta Children's Hospital provides tertiary and quaternary care dedicated to pediatric spine surgery patients and their families. A dedicated spine team successfully manages spinal problems of diverse etiologies in all paediatric age groups, including scoliosis, kyphosis, spondylolisthesis and thoracic insufficiency syndrome. In 2022/2023 the paediatric spine team performed 81 spine surgeries.

Canadian Surgery Solutions

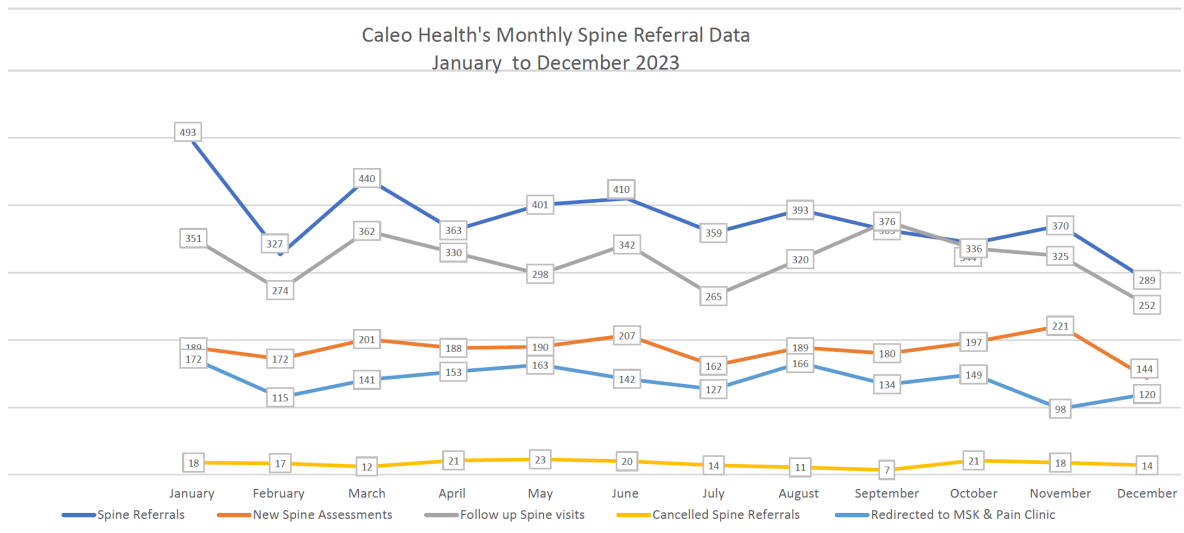
Canadian Surgical Solutions (CSS) is a non-hospital chartered surgical facility equipped to perform a comprehensive range of orthopaedic surgical procedures, including total joint replacements and spinal procedures. Dr. Bouchard, Dr. Cho, Dr. Lewkonja, and Dr. Nicholls completed cases at Canadian Surgery Solutions for a variety of payors including a small footprint of AHS cases.



Consultation Services

Caleo Health

- Ten spine surgeons participate in clinic activity at the Caleo Health outpatient facility: Dr. Bouchard, Dr. Cho, Dr. du Plessis, Dr. Evaniew, Dr. Hu, Dr. Lewkonja, Dr. Nicholls, Dr. Soroceanu, Dr. Swamy and Dr. Thomas.
- Spine Triage Physicians include Dr. Soumbasis, Dr. Eckenswiller, Dr. Meerholz and Dr. Fleck.
- Caleo received approximately 4600 referrals in 2023 (up 17% from 2022).
- The average wait time for spine assessment was approximately 3-4 months in 2023, consistent with 2022.
- In 2023, patients were provided their spine assessment appointment date within 5 -10 business days of completing the spine registration.
- In 2023, referring physicians/healthcare providers received a "Referral Received/Accepted Confirmation" within 2-4 weeks from the time the referral was received at Caleo Health.





- Approximately 45-50% of the patients assessed in 2023 require further referral to a spine surgeon, a similar referral pattern to 2022. The other 50-55% received a referral for physical rehabilitation, pain management and/or conservative treatments.
- All spine patients are provided the option to follow up with the triage physician PRN, until discharged from the spine clinic.
- In 2023, wait time from spine assessment to surgical consult was approximately 12-18 months, consistent with 2022.

Dr. Mark Lewis
Clinical Director, Caleo Health

Spine Triage and Assessment Clinic (STAC)

The Spine Triage and Assessment Clinic (STAC) has now been operational for 19 years. Located on the 12th floor at the Foothills Medical Center as a Neurosurgery clinic, the primary function of STAC is to provide spine triage and assessment to residents of Southern Alberta; and to determine if patients are probable or possible surgical candidates.

Early identification of both surgical and non-surgical candidates facilitates the management of both surgical and non-surgical patients. It leads to greater efficiency of care by promptly directing patients for appropriate care by the right provider.

Educational initiatives about the indications for referral and diagnostic imaging requirements have been developed with community partners, and they attend onsite visits to STAC. In addition, Residents in Physiatry are being exposed to STAC with plans to involve Family medicine and Emergency medicine residents. Training and education in managing patients with spine-related problems would decrease the number of unnecessary referrals, reduce wait times and improve overall patient satisfaction.

Over the last two years, the clinic received 7000 referrals from the community and other specialists. In that same period, the median wait time from referral to the initial appointment was 372 days and 3061 patients were seen in the clinic.



STAC's success is undoubtedly due to Bonnie, Katie and Randi's motivated administrative efforts and dedication of the spine triage physicians, Drs. Gaekwad, Shao and Kandil, and our physiatry partners at Kinesis. We continue to look forward to improving efficiency in triage and assessment.

Dr. Stephan du Plessis

Urgent Consultations and Surgery

Patients presenting with neurologic deficits, fractures, dislocations and tumors are assessed and treated by a spine staff surgeon on call. Eleven adult spine surgeons provide full-time on-call services for the Foothills Hospital while similar coverage is provided at Alberta Children's Hospital. Physicians respond to enquiries for all Alberta Health Services hospitals including Calgary, Southern Alberta, Eastern British Columbia and Southwestern Saskatchewan.



Surgical Activity

Alberta Health Services (FMC)

Surgeries by procedure code from 1-Jul-2022 to 30-Jun-2023 listed for the following surgeons: Bouchard, Cadotte, Casha, Cho, du Plessis, Evaniew, Jacobs, Lewkonja, Nicholls, Salo, Soroceanu, Swamy, Thomas and Yang.

Procedure Group	2022/2023
Odontoid Screw Fixation	2
Cerv Anterior Procedures (corpectomy, arthroplasty, arthroplasty/fusion, ACDF)	207
Cerv fusion/combined approach ant/post	7
Cerv Postr Fusion/Inst	108
Cerv Postr Decompression (includes MIS)	45
Tho/Lum Ant Arthroplasty	14
Tho/Lum Ant Arthroplasty w/Fusion	9
Tho/Lum Ant Fusion	33
Tho/Lum Postr Decompression	581
Tho/Lum Postr Decompression MIS	205
Tho/Lum Postr Fusion No Instrumentation	1
Tho/Lum Postr Fusion MIS	87
Tho/Lum Postr Fusion/Inst 1-3 levels	191
Tho/Lum Postr Fusion/Inst 4+ levels	88
Tho/Lum Fusion Combined Ant & Post	2
Tho/Lum OLIF	33
Tho/Lum DLIF 1-3 levels	58
Tho/Lum DLIF 4+ levels	9
Hardware removal	10
I & D, Debridement	22
Revision lumbar fusion, posterior	8
Misc Spine (includes Excision neoplasm, repair CSF leak, tumor excision, spinal cord tumor, lipoma excision, repair pseudo meningocele, en bloc tumor excision, craniotomy post fossa foramen magnum decomp/chiari	53
Totals	1773



Canadian Surgery Solutions

Between 1-Jul-2022 and 30-Jun-2023, several of our surgeons, including Dr. Bouchard, Dr. Cho, Dr. Lewkonja and Dr. Nicholls, completed cases at Canadian Surgery Solutions for various payors.

Payor	2022/2023
AHS	18
WCB	13
RCMP	1
WSCC	1
Horizon Surgical	44
Totals	77





Inpatient Spine Care

Unit 101 – Foothills Medical Centre

November 2022: Unit 101, along with the rest of the Foothills site, went live with Connect Care. The new workflows were adopted fairly painlessly by the nursing staff, and the system has made communication and consistency of care much safer for our patients. Julie Reader, Unit 101 Clinical Nurse Educator, has been deeply involved in continuous improvements to clinical documentation, orders, data reporting and customization since launch, successfully implementing several improvements that directly impact our spine patient population.

May 2023: Shelly McGuire accepted the new part-time Unit Manager position on Unit 101. Shelly has worked in various roles as a registered nurse for the last 25 years, including 6 years as an emergency nurse in Ontario, 14 years as an emergency nurse at FMC, as well as time spent as a research nurse coordinator with the thrombosis research unit. Most recently her experience has been as an RN with the Bronchoscopy Department, as a casual site manager at FMC, and as a casual unit manager with inpatient neurosciences. Shelly is passionate about supporting and developing herself and her peers, while building inclusive teams. She has demonstrated a keenness for patient and family-centered care and patient care-focused leadership. She is adaptable and enjoys trying to find creative solutions to problems with a collaborative approach.

June 2023: Danielle Michaud accepted the position of Neurosurgery Patient Care Manager for FMC Units 101, 112, and the Calgary Spine Program. Danielle began her career in healthcare as a Physiotherapist in both Red Deer and Calgary, working within the department of Clinical Neurosciences here at the FMC. Danielle also comes with over 11 years of management experience in roles such as Assistant Manager in the Allied Health Departments at both RGH and FMC, and more recently as Unit Manager in the Emergency Department at FMC. Danielle holds a Bachelor of Science in Physical Therapy and is working toward her Master of Arts in Leadership with a specialization in Health. Danielle has expertise in process improvement and project management, and is passionate about coaching, developing, and sustaining resilient and high functioning teams.



Farewell to Brooke Nowicki

After 7 years as the Patient Care Manager for Units 101, 112, and the Calgary Spine Program, Brooke Nowicki has moved on to a new position with the Alberta Surgical Initiative. We are filled with both a sense of loss and an overwhelming gratitude for the privilege of having worked alongside her. We thank her for leading with dedication, humor, kindness and candor, and with a clarity of purpose that cut through organizational challenges as she steered us all toward excellence with unwavering determination. Thank you, Brooke!

*Julie Reader,
Clinical Nurse Educator
Unit 101*



Adult Spinal Deformity

Over the last year, the spinal deformity section's activities have continued and expanded. For the 6th year, we continued multi-disciplinary rounds with spine surgeons, anesthesiologists, and pain management specialists.

On the second Thursday of the month, we meet to discuss pre-operative patients, and review suitability for surgery. We have noticed a frequent change in plans after the meeting and are still planning a prospective study to measure how frequently this happens. We also discuss these patients post-operatively, to review how well the plan was executed and to determine what can be learned from these complex cases. Overall, we discussed 73 pre-op patients and 63 post-op patients in the past 12 months. While some of these patients had spinal deformities, but smaller operations (e.g., decompressions), our volumes continue to be high.

The complex spine anesthesia service that was created in 2022 (CSAG), has continued to play an integral role in deformity spine surgeries at our site. The group of anesthesiologists who participate in this endeavor (Drs Kyle Rogan, Shean Stacey, Josh Wilson, Josh Bennitz and Chris Dyte) provide a consistency in terms of intra-op anesthesia management which benefits our deformity patients in a substantial way. This consistency also allows for investigations into outcomes and fluid management protocols, which we have begun to collaborate on with this specialized team.

In addition to CSAG, we have continued to attempt to improve several aspects of pre-operative optimization of our complex spine patients. The TOPPS program put through a few dozen patients again last year, with a large component of the program still being to ensure that complex spine patients do not proceed to surgery on preop narcotics. In addition, their preliminary data indicate an independent effect of pain teaching (before surgical intervention) on improving psychological metrics of importance, such as catastrophizing, kinesiophobia, anxiety and depression. Surgery resulted in further improvements in the same metrics. These are important and novel data, which suggest significant importance of such pain teaching to surgical outcomes. Analysis of this preliminary retrospective dataset is underway, and a much larger prospective study is on the horizon. We have also established a collaboration with the Alberta Obesity Centre in an attempt to optimize patients in terms of weight and nutrition.



There are several deformity-based research projects ongoing. These include:

- Registry studies
 - ISSG (Soroceanu). Currently in follow-up only.
 - CSORN Deformity (Led by Drs. Soroceanu and Swamy). We are enrolling most patients into this database.
- Pain Management and Pre-Operative Pain Teaching (Eckenswiler, Soumbasis, Evaniew, Soroceanu, Swamy)
 - Narcotic deprescribing effect on outcomes
 - ACT and pain teaching effect on outcomes
- Normative alignment with EOS (Nicholls PI)
 - Variation in acetabular alignment
 - Variation in cervical alignment
 - Prospective evaluation of spinal deformity
- Intervertebral disc mechanics in degenerative scoliosis (Swamy PI)
 - Taylor Bader and Manmeet Dhiman are both finishing M.Sc. theses.
 - Manuscripts to follow.
- Effect of pre-operative obesity reduction on ASD outcomes (Nicholls PI, Richdeep Gill)
- Effects of Teriparatide on complications, surgical Outcomes and health related quality of life in patients undergoing correction of adult spinal deformity (Nicholls PI)
- Creation of a Patient Decision Aide (PtDA) to decrease decisional regret (Swamy PI, Valerie Cates M.Sc. student)

Victoria Smith, PhD
Dr. Ganesh Swamy

EDUCATION

Undergraduate

Surgeons take part in both scheduled didactic lectures as well as problem-based small-group learning environments. The orthopaedic and neurosurgeons play an active role in teaching medical students anatomy and physical examination techniques.

Postgraduate Resident

The orthopaedic and neurosurgical consultants provide both formal and informal teaching to the postgraduate residents in orthopaedics and neurosurgery. Formal teaching takes the form of lecture supervision and case discussion during the academic half days. Informal teaching takes place in the operating room and clinic setting. Dr. Peter Lewkonja is the Assistant Program Director for the orthopaedics residency program.

Each year the Calgary spine program offers a cadaveric dissection course to senior orthopaedic and neurosurgical residents enrolled in Canadian residency training programs. The course occurs under the direction of Dr. Brad Jacobs, with many faculty and spinal surgery fellows acting as course faculty and provides an opportunity to review spinal surgical techniques and implant systems.

Postgraduate MSc/PhD

Consultants within the spine program have supervised several graduate students at the University of Calgary. These graduate students have pursued training in both basic science and clinical research.

Dr. David Cadotte, Supervisor:

- Al-Shawwa, Abdul. M.Sc. candidate (September 2022 - June 2024)
 - Medical Sciences Graduate Program
 - Specialization in Bioinformatics and Advanced Medical Imaging
 - Thesis: Machine Learning based tools for Predicting Neurological Deterioration in Non-operative Degenerative Cervical Myelopathy Patients.



- Ost, Kalum Ost, M.Sc. candidate (September 2020 - June 2024)
 - Biochemistry and Molecular Biology Graduate Program
 - Specialization in Bioinformatics and Advanced Medical Imaging
 - Thesis: Predictive Modeling of Community Acquired MRI after a diagnosis of Degenerative Cervical Myelopathy: Baseline Disease Severity and Surgical Outcomes.

Dr. Ganesh Swamy, Supervisor:

- Bader, Taylor. M.Sc. Biomedical Sciences. 2020-2023 Do Biochemical and Structural Differences in the Female Post-Menopausal Intervertebral Disc Result from Degenerative Scoliosis and Spondylolisthesis?
- Bader, Taylor. PhD. Biomedical Sciences 2023-2027. Proteomics, Degradomics and In-Situ Genomics to Explain Differences Between Annulus Fibrosus Mechanical Properties.
- Bangsboll, Emily. M. Sc. Biomedical Engineering. 2022-2025. Quantification of in-vivo 3D cervical spine motion for cervical TDA.
- Cates, Valerie. M.Sc. Biomedical Sciences 2022-2025. Development of a Patient Decision Aide in Adult Spinal Deformity.
- Dhiman, Manmeet. M.Sc. Biomedical Engineering. 2021-2023 Multiscale Mechanical Changes to the Collagenous Structure in the Annulus Fibrosus from Adult Degenerative Scoliosis and Spondylolisthesis Surgical Patients.



Rounds

Weekly Spine Rounds are typically held Wednesdays from 7-8 AM. Neurosurgery, Orthopaedic Surgery, Spine Fellows, Neurosurgery Residents, Orthopaedic Residents, Nurse Practitioners, Research Staff and Industry Partners attend rounds. A variety of cases are presented by the Spine Fellows. The Neurosurgery and Orthopaedic Surgery residents are then asked for feedback under the guidance of the staff surgeons.

Spinal Surgery Fellow rounds also take place each Tuesday in a didactic seminar series format on in depth topics pertinent to spinal surgery fellowship training.





Postgraduate Spine Fellowship Program

Spine Fellowship at the University of Calgary is a combined Orthopaedic and Neurosurgical clinical experience. The goals of the fellowship are to train Neurosurgical and Orthopaedic surgeons in the diagnosis and management of diseases of the spine. The University of Calgary Spine program is an AO sponsored fellowship program. Our fellows fully participate in the AO Spine fellow's and Global Spine Diploma curriculae, gaining exposure to other global leaders in spine surgery, attending the annual AO Spine fellows' course and forum and sitting the AO Global Diploma exam.

The Calgary Spine Program is a multidisciplinary group dedicated to the management of individuals with spinal pathology. The emphasis of the fellowship is on the decision-making and surgical techniques relevant to spine surgery. At the end of the fellowship, the trainee will have the experience and ability to independently perform surgical approaches, decompressions, instrumentation, and deformity correction in all areas of the spine from the occiput to the sacrum. Participating fellows will gain proficiency with:

- Decompression techniques from anterior, lateral and posterior approaches
- Exposure to multiple different instrumentation systems, including for anterior and posterior stabilization of the cervical, thoracic and lumbar spine
- Motion preservation techniques including Cervical and Lumbar disc arthroplasty
- Open and Minimally Invasive approaches for anterior, lateral and posterior access
- Free hand, fluoroscopy assisted and fully navigated, computer assisted instrumentation techniques
- Cervical, Thoracic, Lumbar and Sacropelvic trauma management at Canada's busiest level 1 trauma centre
- Multidisciplinary, sub-specialty focused approaches to managing complex metastatic and primary tumour and deformity cases



DR.
FRED
NICHOLLS

Fellowship
Director



The Spine Fellowship year runs from July 1 to June 30 of the following year. Time is equally divided between four combined Orthopaedic and Neurosurgical services with focuses on Oncology, Deformity, Myelopathy and MIS surgery. Combined teaching conferences occur twice weekly with curriculum-based discussion and presentation of both recent and complex cases. Monthly mortality and morbidity rounds occur with the full attendance of Orthopaedic and Neurosurgical house staff and Spine Program attending staff. Spinal deformity rounds are held twice a month, Journal Clubs once monthly, and faculty research nights held quarterly. Fellows average three OR days per week, along with weekly outpatient clinics performed with the attending staff. Informal teaching occurs in all settings with junior house staff and residents. All fellows are granted leave to attend the AO fellows course and forum, the Canadian Spine Society annual meeting, and any meeting at which they are presenting their research.

Spine Service call occurs in one-week blocks for each attending and rotates between Orthopaedic and Neurosurgery. During this time the house staff and Fellows assigned to the attending surgeon form the spine team on call. The resident and fellow make initial assessments and management decisions, with close supervision by the attending staff. All fellow call is at-home call with no in-hospital responsibilities. During the course of the year, a clinical research project is required and must be completed prior to the conclusion of the training year. The fellow and the supervisor of the fellow's choice mutually agree upon this research project. The fellow is expected to produce at least one manuscript suitable for publication in a peer-reviewed journal.



ADULT SPINE FELLOWS
2022-2023

Dr. Alysa Almojuela
Dr. James Wu
Dr. Addison Wood
Dr. Martin Gagliardi



Fellowship Testimonial

The Calgary Spine Fellowship produces well-rounded, proficient spine surgeons year after year, and I am truly grateful for my own experience with this incredible program. The clinical experience covered everything from occiput to sacrum, and a wide range of approaches including MIS, open, posterior, anterior and lateral. In the operating room, through appropriate supervision and gradual independence, the team helped bolster my growing autonomy and leadership skills as the months went by. I felt ready to tackle a busy academic practice at the end of fellowship, thanks to the broad clinical exposure and operative experiences I had.

One of the best aspects of the program was the educational curriculum, which included resident rounds, fellow rounds, morbidity and mortality rounds and journal clubs. Gaining valuable insight from multiple surgeons with varying practices and a range of personalities taught me that multiple solutions can exist for the same problem, and sometimes there is no one correct answer. The brutal honesty of the surgeons, pearls of wisdom, and friendly debates greatly enriched the overall learning experience.

Importantly, the Calgary surgeons were also great role models in collegiality, and I am thankful for the career-long connections this experience created. My evolution from resident, to fellow, to neurosurgeon and spine attending, was fostered by mentors in Calgary, who were always quick to share their tips and tricks and lessons learned. The fantastic reputation of the Calgary Spine Program is clearly well-earned, and I am grateful to have had the opportunity to train as a Calgary fellow.

Dr. Alysa Almojuela





RESEARCH

The University of Calgary Spine Program had a very successful research year. Our faculty were principal investigators or collaborators on 7 externally funded research grants (worth over \$930,000). Faculty members authored 66 peer-reviewed publications. In addition, 21 research abstracts were presented at national or international meetings with authorship/co-authorship involvement from Calgary Spine Group faculty.

This research productivity was a direct result of our involvement in a multitude of clinical research initiatives. These research endeavors ranged from retrospective reviews of local clinical data on a wide range of spinal surgery topics to multicenter data analysis of large prospective spinal surgery patient registries.

The University of Calgary continues to be the largest enrolling site for the Canadian Spine Society's national Canadian Spine Outcomes and Research Network (CSORN) prospective spine surgery registry, which includes participation in four prospective CSORN sub-studies related to degenerative cervical myelopathy, degenerative spondylolisthesis, isthmic spondylolisthesis and adult spinal deformity.

In addition to our clinical research efforts, Spine Group members are also involved in active collaborations with basic scientists in musculoskeletal and neuroscience translational research projects through the McCaig Bone & joint Institute and the Hotchkiss Brain Institute.

This year the spine program welcomed back Dr Michael Yang, as a colleague, after he completed his spine fellowship training with Dr Mike Wang in Miami. Dr Yang will develop his research interest centered around enhanced recovery after spine surgery and spinal endoscopy.

Finally, it is very important to note that all the recent research successes of the Calgary Spine Faculty are a direct result of our 5 excellent, efficient, and highly organized research associates: Tara Whittaker, Ish Bains, Saswati Tripathy, Victoria Smith and Manpreet Kaur.



DR.
KEN
THOMAS

Research
Director



2022-2023 RESEARCH PROJECTS

Prospective RCTs enrolling	PI	Status
Nerve Transfer after Spinal Cord Injury	Casha/Midha	Enrolling/data collection
Immunotherapy for Acute SCI (Abbvie)	Jacobs	Enrolling/data collection
MT-3921-A01 Randomized clinical Trial SCI	Casha	Enrolling/data collection
Epidural Stimulation in Cervical SCI (HEMO STIM)	Casha/Girgis/Phillips	Enrolling/data collection
Prehab for Patients with Lumbar Spinal Stenosis	Thomas/Gross	Enrolling/data collection
Prospective Randomized Clinical Trials in follow-up		
Cerapedics: i-FACTOR Study	Jacobs	In follow-up
Clinical Studies - Observational		
Cervical Myelopathy (CSORN)	Cadotte	Enrolling/data collection
Degenerative Spondy Cohort Study (CSORN)	Fisher/Casha/Thomas	In follow-up
Surgical Treatment of ASD (CSORN Module, Non-module)	Soroceanu	Enrolling/data collection
qMRI & cervical myelopathy (CSORN)	Cadotte	Enrolling/data collection
Natural History of Mild Degenerative Cervical Myelopathy: observational study (CSORN)	Cadotte	Enrolling/data collection
Mech difference in IVD of degen scoli & spondy	Swamy	Enrolling/data collection
Analysis of the Implications of Lumbopelvic Alignment on the Alignment of the Cervical Spine	Nicholls	Analysis
Normative EOS analysis of lower extremity alignment - Acet	Nicholls	Under Review
Can Systemic inflammatory profiles predict Natural history of lumbar disc herniations	Swamy/Salo	Enrolling/data collection
Quantifying in-vivo cervical spine motion and influence of cervical total disc arthroplasty	Swamy/Salo/Bouchard	Enrolling/data collection
Quantifying chronic opioid use in ASD patients	Soroceanu	Analysis
Opt timing of surg for symptomatic lumbar disc herniation	Thomas/Ben-Israel/Spackman	Manuscript Prep
Effects of obesity on outcomes after degen lumb spine surg	Evaniew	Analysis
Midterm outcomes of m6l anterior lumbar disc replacement	Bouchard/Ludwig	Edits
Imaging Biomarkers in spinal cord injury-Imaging library of acute traumatic SCI	Cadotte	Enrolling/data collection
Manage my pain (MMP)	Rasic/Lewkonja	Enrolling/data collection
Preoperative insomnia on poor postoperative pain control after elective spine surgery	Yang	Under Review
Patient expectations of thoracolumbar deformity surgery	Soroceanu/Thomas/Singh	Manuscript Prep
Relationship between poor postoperative pain control and surgical outcomes after elective spine surgery	Yang	Manuscript Prep
CSM anterior vs post	Evaniew	Analysis
How patients who have had their preoperative expectations met vs those that have not differ from one another	Thomas/Singh	Enrolling/data collection



Prospective Data Collection		
PRAXIS - SCI database traumatic/non-traumatic	Casha	Enrolling/data collection
ISSG - Deformity (UCAPONY & non-UCAPONY)	Soroceanu	In follow-up
CSORN	Soroceanu	Enrolling/data collection
Fellow Projects		
Syst Review of Interventions to Modify Psychological Comorbidities in Patients Undergoing Spine Surgery	Almojuela/Evaniew	Enrolling/data collection
Obesity and Outcomes in Patients Undergoing Lumbar Surgery : An Observational Study From CSORN	Wu/Evaniew	Enrolling/data collection
Effect of Forteo (Teriparatide) in reducing osteoporosis related complications in spine deformity patients	Wu/Nicholls	Enrolling/data collection
Normative alignment comparative analysis	Gagliardi/Nicholls	Manuscript Prep
Incidence of recovering leg pain after subsidence	Gagliardi	Enrolling/data collection
Sub-analysis on disc study	Wood/Swamy	Enrolling/data collection
Sonication/culture project on indolent spine infections	Wood/Nicholls	Enrolling/data collection
How does the Ames Cervical Deformity class. Apply to the normal pop?	Cowley/Nicholls	Edits





Published Manuscripts

1-Jul-2022 to 30-Jun-2023

*Peer-Reviewed Publications (Bold denotes Calgary Spine Program Faculty,
* denotes Calgary Spine Fellow):*

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8. **Evaniew N**, *Coyle M, Rampersaud YR, Bailey CS, **Jacobs WB**, **Cadotte DW**, **Thomas KC**, Attabib N, Paquet J, Nataraj A, Christie SD, Weber MH, Phan P, Charest-Morin R, Fisher CG, Hall H, McIntosh G, Dea N. Timing of Recovery After Surgery for Patients With Degenerative Cervical Myelopathy: An Observational Study From The Canadian Spine Outcomes and Research Network. *Neurosurgery.* 2023 Feb 1;92(2):271-282. doi: 10.1227/neu.0000000000002213. Epub 2022 Nov 15. PMID: 36637265
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33. Passias PG, Krol O, Moattari K, Williamson TK, Lafage V, Lafage R, Kim HJ, Daniels A, Diebo B, Protosaltis T, Mundis G, Kebaish K, **Soroceanu A**, Scheer J, Hamilton DK, Klineberg E, Schoenfeld AJ, Vira S, Line B, Hart R, Burton DC, Schwab FA, Shaffrey C, Bess S, Smith JS, Ames CP. Evolution of Adult Cervical Deformity Surgery Clinical and Radiographic Outcomes Based on a Multicenter Prospective Study: Are Behaviors and Outcomes Changing With Experience? *International Spine Study Group. Spine (Phila Pa 1976).* 2022 Nov 15;47(22):1574-1582. doi: 10.1097/BRS.0000000000004419. Epub 2022 Jul 1.PMID: 35797645
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35. Passias PG, Pierce KE, Alas H, Bortz C, Brown AE, Vasquez-Montes D, Oh C, Wang E, Jain D, O'Connell BK, Raad M, Diebo BG, **Soroceanu A**, Gerling MC. A predictive model of perioperative myocardial infarction following elective spine surgery. *J Clin Neurosci.* 2022 Jan;95:112-117. doi: 10.1016/j.jocn.2021.11.032. Epub 2021 Dec 9.PMID: 34929633



36. Passias PG, Poorman GW, Vasquez-Montes D, Kummer N, Mundis G, Anand N, Horn SR, Segreto FA, Passfall L, Krol O, Diebo B, Burton D, Buckland A, Gerling M, **Soroceanu A**, Eastlack R, Kojo Hamilton D, Hart R, Schwab F, Lafage V, Shaffrey C, Sciubba D, Bess S, Ames C, Klineberg E; International Spine Study Group. Predictive Analytics for Determining Extended Operative Time in Corrective Adult Spinal Deformity Surgery. *Int J Spine Surg*. 2022 Apr;16(2):291-299. doi: 10.14444/8174.PMID: 35444038
37. Rampersaud YR, Canizares N, Perruccio AV, Abraham E, Bailey CS, Christie S, **Evaniew N**, Finkelstein JA, Glennie AR, Johnson MG, Nataraj A, Paquet J, Phan P, Weber M, **Thomas KC**, Manson N, Hall H, Fisher CG. Fulfillment of patient expectations following spine surgery is critical to patient satisfaction: A cohort study of spine surgery patients. *Neurosurgery*. July 1, 2022;91(1):173-181. DOI: 10.1227/neu.0000000000001981. Epub Apr 22, 2022.
38. Rehman Y, Bala M, Rehman N, Agarwal A, Koperny M, Crandon H, Abdullah R, Hull A, Makhdami N, Grodecki S, Wrzosek A, Lesniak W, **Evaniew N**, Ashoorion V, Wang L, Couban R, Drew B, Busse JW. Predictors of Recovery Following Lumbar Microdiscectomy for Sciatica: A Systematic Review and Meta-Analysis of Observational Studies. *Cureus*. 2023 May 29;15(5):e39664. doi: 10.7759/cureus.39664. eCollection 2023 May.PMID: 37388594
39. Romagna A, Wilson JR, **Jacobs WB**, Johnson MG, Bailey CS, Christie S, Paquet J, Nataraj A, **Cadotte DW**, Manson N, Hall H, **Thomas KC**, Schwartz C, Rampersaud YR, McIntosh G, Fisher CG, Dea N: Factors Associated With Return to Work After Surgery for Degenerative Cervical Spondylotic Myelopathy: Cohort Analysis from the Canadian Spine Outcomes and Research Network. *Global Spine J*. May 2022;12(4):573-578. DOI: 10.1177/2192568220958669
40. Shah S, Mudigonda S, Underhill TM, **Salo PT**, Mitha AP, Krawetz RJ. Prx1⁺ and Hic1⁺ Mesenchymal Progenitors Are Present Within the Epidural Fat and Dura Mater and Participate in Dural Injury Repair. *Stem Cells Transl Med*. Mar 17, 2022;11(2):200-212. DOI: 10.1093/stcltm/szab014
41. Shah SS, **Salo PT**, Lyons FG, Mitha AP, Krawetz RJ. Prx1⁺ MPCs Accumulate in the Dura Mater of Wild-Type and p21^{-/-} Mice Followed by a Specific Reduction in p21^{-/-} Dural MPCs. *Adv Biol (Weinh)*. 2022 Oct 3:e2101304. doi: 10.1002/adbi.202101304.



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43. *Singh V, *Oppermann M, **Evaniew N, Soroceanu A, Nicholls F, Jacobs WB, Thomas KT**, and **Swamy G**. Lateral lumbar interbody fusion with rhBMP-2 can achieve high fusion rates in adult spine deformity surgeries. *Global Spine J.* May 18, 2022 [epub ahead of print]. DOI: 10.1177/21925682221103512
44. **Swamy G, Salo P**, Duncan N, Jirik F, Matyas J. IL-1Ra deficiency accelerates intervertebral disc degeneration in C57BL6J mice. *JOR Spine.* Apr 23, 2022;5(2):e1201. DOI: 10.1002/jsp2.1201
45. *Teles AR, *Aldebeyan S, *Aoude A, **Swamy G, Nicholls FH, Thomas KC, Jacobs WB**: Mechanical Complications in Adult Spinal Deformity Surgery: Can Spinal Alignment Explain Everything? *Spine.* Jan 1, 2022;47(1):E1-E9. DOI: 10.1097/BRS.00000000000004217.
46. Wang S, Hebert JJ, Abraham E, Vandewint A, Bigney E, Richardson E, El-Mughayyar D, Attabib N, Wedderkopp N, Kingwell S, **Soroceanu A**, Weber MH, Hall H, Finkelstein J, Bailey CS, **Thomas K**, Nataraj A, Paquet J, Johnson MG, Fisher C, Rampersaud YR, Dea N, Small C, Manson N. Postoperative recovery patterns following discectomy surgery in patients with lumbar radiculopathy. *Sci Rep.* 2022 Jul 1;12(1):11146. doi: 10.1038/s41598-022-15169-8.PMID: 35778472
47. **Yang MH**, Riva-Cambrin J, Cunningham J, **Casha S**. Validation of the Calgary Postoperative Pain after Spine Surgery Score for Poor Postoperative Pain Control after Spine Surgery. *Can J Neurol Sci.* Epub 2022 Oct 24. DOI: 10.1017/cjn.2022.305
48. Ye J, Gupta S, Farooqi AS, Yin TC, **Soroceanu A**, Schwab FJ, Lafage V, Kelly MP, Kebaish K, Hostin R, Gum JL, Smith JS, Shaffrey CI, Scheer JK, Protosaltis TS, Passias PG, Klineberg EO, Kim HJ, Hart RA, Hamilton DK, Ames CP, Gupta MC. Use of multiple rods and proximal junctional kyphosis in adult spinal deformity surgery. *J Neurosurg Spine.* 2023 Jun 9;39(3):320-328. doi: 10.3171/2023.4.SPINE23209. Print 2023 Sep 1.PMID: 37327142



Published Book Chapters

1-Jul-2022 to 30-Jun-2023

*Published Book Chapters (Bold denotes Calgary Spine Program Faculty, * denotes Calgary Spine Fellow):*

2022

1. Akbar MA, Martin AR, Pfyffer D, **Cadotte DW**, Kurpad S, Freund P, Fehlings MG. Advanced imaging for spinal cord injury. In Neural Repair and Regeneration After Spinal Cord Injury and Spine Trauma. 2022 Jan 1 (pp. 105-124). Academic Press.
2. Ben-Israel D and **Jacobs WB**: Spine Trauma Management Issues: Thoracic and Lumbar, Chapter 11, pp. 191 – 210, in Neural Repair and Regeneration After Spinal Cord Injury and Spine Trauma, Fehlings MG, Kwon BK, Vaccaro AR and Oner FC (Eds.). London: Elsevier. 2022.
3. Ost KJ, Anderson DW and **Cadotte DW**. Delivering Precision Medicine to Patients with Spinal Cord Disorders; Insights into Applications of Bioinformatics and Machine Learning from Studies of Degenerative Cervical Myelopathy. [Online First], IntechOpen. 2021 Jul 2. DOI:10.5772/intechopen.98713



Presentations

1-Jul-2022 to 30-Jun-2023

*(Bold denotes Calgary Spine Program Faculty, * denotes Calgary Spine Fellow)*

2023

1. *Almojuela A, **Swamy G**, **Nicholls F**, **Jacobs WB**, **Soroceanu A**, Eckenswiler D, **Evaniew N**. Interventions to modify maladaptive psychological traits in patients undergoing spine surgery: a systematic review. (Poster) AO Fellows Forum, Banff, AB, Mar 30-Apr 2, 2023
2. Ben-Israel D, Crawford EJ, Fisher C, Dea N, Spackman E, Rampersaud R, **Thomas KC**. Optimal timing of surgery for symptomatic single-level lumbar disc herniation: a cost effectiveness analysis. Presented by: **Thomas KC** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023
3. Dvorak MF, Evaniew N, Chen M, Waheed Z, Rotem-Kohavi N, Fallah N, Noonan VK, Fisher CG, Charest-Morin R, Dea N, Ailon T, Street J, Kwon BK. The impact of specialized versus nonspecialized acute hospital care on survival among patients with acute incomplete traumatic spinal cord injuries: a population-based observational study from British Columbia, Canada. Presented by: **Evaniew N** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023
4. **Evaniew N**, *Coyle M, Rampersaud YR, Bailey CS, **Jacobs WB**, **Cadotte DW**, **Thomas KC**, Attabib N, Paquet J, Nataraj A, Christie SD, Weber MH, Phan P, Charest-Morin R, Fisher CG, Hall H, McIntosh G, Dea N. Timing of recovery after surgery for patients with Degenerative Cervical Myelopathy: An observational study from the Canadian Spine Outcomes and Research Network. Presented by: **Evaniew N** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023
5. **Evaniew N**, *Burger LD, Dea N, **Cadotte DW**, Bailey CS, Christie SD, Fisher CG, Rampersaud YR, Paquet J, Singh S, Weber MH, Attabib N, Johnson MG, Manson N, Phan P, Nataraj A, Wilson JR, Hall H, McIntosh G, **Jacobs WB**. Deterioration



after surgery for patients with Degenerative Cervical Myelopathy: An observational study from the Canadian Spine Outcomes and Research Network. Presented by: **Evaniew N** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

6. Ludwig TE, Sridharan S, Frederick A, Edwards WB, Asmussen MJ, **Nicholls FH**: Analysis of the Implications of Cervical Spine Alignment on Lumbopelvic Alignment. (Poster) Global Spine Congress, Prague, Czech Republic, May 31- Jun 3, 2023
7. **Soroceanu A, Nicholls F, Thomas K, Evaniew N, Bouchard J, Salo P, Jacobs WB**. Effect of compensation claim status on perioperative outcomes in patients with degenerative spine conditions. Presented by: **Soroceanu A** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023
8. **Soroceanu A, Nicholls F, Thomas K, Evaniew N, Lewkonja P, Bouchard J, Jacobs WB**. Economic impact of wait time in degenerative lumbar stenosis surgery: association with time away from work, chronic persistent opioid use, and patient satisfaction. Presented by: **Soroceanu A** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023
9. **Soroceanu A, Nicholls F, Thomas K, Evaniew N, Salo P, Bouchard J, Jacobs WB**. National adverse event rates following cervical spine surgery for degenerative disorders, and impact on patient satisfaction. Presented by **Soroceanu A** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023
10. **Soroceanu A, Nicholls F, Thomas K, Evaniew N, Salo P, Bouchard J, Jacobs B**. Predictors of poor postoperative patient satisfaction in elective spine patients with preexisting compensation claims. (Poster) Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023
11. **Yang MH**, Far R, Sajobi T, Riva-Cambrin J, **Casha S**. Relationship between poor postoperative pain control and surgical outcomes after elective spine surgery. Presented by: **Yang MH** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023



12. **Yang MH**, Riva-Cambrin J, Cunningham J, **Casha S**. Preoperative insomnia on poor postoperative pain control after elective spine surgery and the Modified Calgary Postoperative Pain After Spine Surgery (CAPPS) score. Presented by: **Yang MH** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

2022

1. *Aldahamsheh O, *Burger LD, **Evaniew N, Swamy G, Jacobs WB, Thomas KC, Nicholls F**. Unexpected intraoperative positive culture (UIPC) in presumed aseptic revision spine surgery: A systematic review and meta-analysis. (Poster) 19th Annual AOSpine North America Fellows' Forum, Banff, AB, Mar 23-27, 2022
2. *Aldahamsheh O, *Burger LD, **Evaniew N, Swamy G, Jacobs WB, Thomas KC, Nicholls F**. Unexpected intraoperative positive culture (UIPC) in presumed aseptic revision spine surgery: A systematic review and meta-analysis. (Poster) Canadian Spine Society Annual Meeting, Virtual, April 2022
3. *Aldahamsheh O, *Burger LD, **Evaniew N, Swamy G, Jacobs WB, Thomas KC, Nicholls F**. Unexpected intraoperative positive culture (UIPC) in presumed aseptic revision spine surgery: A systematic review and meta-analysis. Presented by: *Osama Aldahamsheh (Podium). Global Spine Congress, Las Vegas, USA, June 1-4, 2022
4. *Cowley R, Ludwig T, *Coyle M, Asmussen M, Edwards B, **Nicholls F**: Application of the Ames-International Spine Study Group (AMES) Radiographic Modifiers to an asymptomatic population: Are the thresholds for 'normal' appropriate? Presented by: *Richard Cowley (Podium). Canadian Spine Society Annual Meeting, Virtual, April 2022. Winner: Best Paper from a trainee in Clinical Fellowship
5. *Cowley R, Ludwig T, *Coyle M, Asmussen M, Edwards B, **Nicholls F**: Application of the Ames-International Spine Study Group (AMES) Radiographic Modifiers to an asymptomatic population: Are the thresholds for 'normal' appropriate? Presented by: *Richard Cowley (Podium). Global Spine Congress, Las Vegas, USA, June 1-4, 2022



6. **Evaniew N**, *Burger L, Dea N, **Cadotte DW**, Bailey CS, Christie SD, Rampersaud YR, Paquet J, Singh S, Weber MH, Attabib N, Johnson MG, Manson N, Phan P, Nataraj A, Wilson JR, Hall H, McIntosh G, **Jacobs WB**. Early neurological deterioration after surgery for cervical spondylotic myelopathy: an observational study from CSORN. Presented by: *Lukas Burger (Podium). 19th Annual AOSpine North America Fellows' Forum, Banff, AB, Mar 24, 2022
7. **Evaniew N**, *Coyle MJ, Rampersaud YR, Bailey CS, **Jacobs WB**, **Cadotte DW**, **Thomas KC**, Attabib N, Paquet J, Nataraj A, Christie SD, Weber MG, Phan P, Charest-Morin R, Fisher CG, Hall H, McIntosh G, and Dea N. Timing of recovery after surgery for patients with cervical spondylotic myelopathy: An observational study from the Canadian Spine Outcomes and Research Network. Presented by: *Matthew Coyle (Podium). 19th Annual AOSpine North America Fellows' Forum, Banff, AB, Mar 24, 2022
8. Ludwig TE, Sridharan S, Frederick A, Edwards WB, Asmussen MJ, **Nicholls FH**. Analysis of the Implications of Cervical Spine Alignment on Lumbopelvic Alignment. (Podium) 50th Annual Cervical Spine Research Society Meeting 2022, San Diego, Nov 16-19, 2022
9. **Yang M**, Riva-Cambrin J, Cunningham J, **Casha S**. Impact of preoperative insomnia on poor postoperative pain control after spine surgery and the Modified Calgary Postoperative Pain after Spine Surgery Score. Presented by: **Yang M** (Podium). American Association of Neurological Surgery Conference, Philadelphia, Pennsylvania 5th Enhanced Recovery After Surgery (ERAS) USA Congress, Washington DC, Apr 29-May 2, 2022



Grants

1-Jul-2022 to 30-Jun-2023

Active Research Grants (Bold denotes Spine Program Faculty)

Cadotte D. Praxis Spinal Cord Institute Grant # G2023-18 Building an Image Bank/Repository Customized Portal Software for BIDs and DICOM Image Data Management with Data Collection Tool. April 2022 - March 2024. Amount \$40,000

Cadotte D. Alberta Spine Foundation, Calgary Chapter: Integrating clinical metrics of balance, gait and hand function with an advanced MRI protocol improves machine learning modeling of the natural history of mild degenerative cervical myelopathy. Principal Investigator. April 2023 - April 2025. Amount \$75,000

Cadotte D. Canadian Institutes of Health Research (CIHR) Project Grant: Defining the Natural History and Predictors of Disease Progression in Mild Degenerative Cervical Myelopathy: A Longitudinal Multicenter Prospective Cohort Study. Co-Principal Investigator (Lead: J.Wilson, University of Toronto). 2019-present. Amount \$700,000

Casha S, Cadotte D. Praxis Institute. Rick Hansen Spinal Cord Injury Registry Project 3.0 Revision. Principal Investigator. 2022-present. Amount \$50,000

Nicholls F. Analysis of the Implications of Lumbopelvic Alignment on the Alignment of the Cervical Spine:

- Fraternal Order of Eagles Spine Grant \$20,000
- McCaig Catalyst Grant \$30,000
- Division of Orthopaedic Surgery \$30,000
- Total Funding: \$80,000

Nicholls F. Normative Relationship of Spino-Pelvic Alignment to Femoral-Acetabular Orientation:

- Alberta Spine Foundation Grant \$20,000
- COREF Grant \$9,875
- Total Funding: \$29,875



Nicholls F. Robotic Assessment of Post-call Motor Function in Orthopaedic Residents: A Multi-centre Comparison of the Night Float Model and the Standard Call Model

- PARA Wellness Initiative Grant \$2,500
- Office of Health and Medical Education Scholarship \$10,000
- COREF Grant \$5,000
- Total Funding: \$17,500

Nicholls F. Validation of the Femorotibial Ratio using EOS imaging

- COREF Grant (7,400)
- Total Funding: \$7,400

Swamy G, Duncan N, Matyas J, **Salo P,** Hart D. Are Sex-Differences in Degenerative Spondylolisthesis and Degenerative Scoliosis Explainable by Mechanical Differences in the Post-Menopausal Intervertebral Disc? Amount \$65,000.

- AO Discovery Grant (\$45,000 CHF) [2022]
- McCaig Institute Clinician-Scientist Grant (\$20,000) [2022]

Swamy G. Development of a Patient Decision Aide in Adult Spinal Deformity (\$20 000)

- Faculty Seed Grant Div Orthopaedics (\$20,000) [2022]

Swamy G. supervising Valerie Cates. Development of a Patient Decision Aide in Adult Spinal Deformity

- University of Calgary Division of Orthopaedics Faculty Seed Grant \$20,000

ADMINISTRATIVE CONTRIBUTIONS

Regional

Bouchard J. Ombudsman, University of Calgary Orthopaedic Surgery Residency Program (2021 to present)

Cadotte D. Spinal Cord Injury Advisory Committee, Alberta Health Services, Foothills Medical Centre (September 2020 to present)

Cadotte D. Alberta Spine Foundation, Member and Web communications advisor (Sept 2017 to present)

Cadotte D. Brain and Mental Health Research Committee, Hotchkiss Brain Institute, University of Calgary (2017 to present)

Casha S. Head, Division of Neurosurgery, Department of Clinical Neurosciences, University of Calgary (2020 to present)

Jacobs WB. Chairperson, University of Calgary Spine Program, Calgary, Alberta, Canada (2019 to present)

Jacobs WB. Organizing Committee, Chair, University of Calgary Spinal & Peripheral Nerve Anatomy and Surgery Annual National Residents Course (2009 to present)

Lewkonja P. Clinical co-lead, ERAS, Calgary spine program (2021 to present)

Lewkonja P. Ombudsperson. Calgary Anesthesia Fellowship Program, Alberta Health Services (2022-present)

Lewkonja P. Co-Chair Alberta Surgery Initiative (Calgary Zone, Orthopaedics) (2021-present)

Lewkonja P. Foothills Medical Centre Orthopaedics Quality Improvement Co-Lead (2020-present)

Lewkonja P. Orthopaedic Surgery Residency Assistant Program Director (2020 to present)



Lewkonja P. RCPSC Orthopaedic Surgery examiner (2019 to present)

Lewkonja P. Orthopaedic Surgery Residency Program Spine Education Lead (2018-2022)

Lewkonja P. Division of Spine Surgery Lead, Section of Orthopaedics (2018 to present)

Nicholls F. Fellowship Director, University of Calgary Spine Program, Calgary, Alberta, Canada (2018-present)

Soroceanu A. Orthopaedic Research Portfolio Committee – Spine representative (2014 to present)

Soroceanu A. Adult Spinal Deformity Committee, Foothills Medical Centre (2014 to present)

Thomas K. Chair of Spine Research, University of Calgary Spine Program (2018 to present)

Thomas K. University of Calgary Department of Surgery Peer Support Member (Oct 2020 to present)

Provincial

Jacobs WB. Chair, Alberta Spine Foundation (2022 to present)

Lewkonja P. Neuroscience, Rehabilitation and Vision Strategic Clinical Network QI Steering Committee member, Alberta Health Services (2021 to present)

Lewkonja P. Alberta Health Evidence and Review Panel (Back Pain), Alberta Health (2020 to present)

Lewkonja P. Orthopaedics Specialty Working Group (Connect Care), Alberta Health Services (2020-present)

Lewkonja P. Surgery Area Council, Connect Care, Alberta Health Services (2018 to present)

Lewkonja P. Alberta Pain Strategy Spine Representative, Alberta Health Services (2018 to present)



Thomas K. Low Back Pain Expert Advisory Group for Alberta Health (2020 to present)

Thomas K. Tri-lead of the Bone and Joint Health Strategic Clinical Network – MSK Transformation- Spine Health Work Group (2019 to present)

National

Cadotte D. National Technical Advisory Committee, Rick Hansen Institute (Praxis) and Canadian Spine Outcomes Research Network (2020 to present)

Casha S. CIHR Collaborative Health Research Projects – NSERC Partnered peer review panel member (2014 to present)

Jacobs WB. Member, Royal College of Physicians and Surgeons of Canada Spinal Surgery Area of Focused Competency Diploma Working Group, (2022 – present)

Jacobs WB. Examiner, Royal College of Physicians and Surgeons of Canada Neurosurgery Examination Board, (2021 – present)

Jacobs WB. Education Chair, Canadian Spine Society (2021 to present)

Lewkonja P. Examiner, RCPSC Orthopaedic Surgery (2019-present)

Soroceanu A. Canadian Spine Society (CSS), Executive Committee – Member at large (2020 to present)

Soroceanu A. Canadian Spine Outcomes and Research Network (CSORN), Lead Data Quality Taskforce (2018 to present)

Soroceanu A. Canadian Spine Society, Scientific Program Committee (2016 to present)

Thomas K. Canadian Spine Society. President (2023 to 2025)



Thomas K. RCPSC Orthopaedic Surgery Speciality Committee, Member (2019 to present)

Thomas K. Canadian Spine Research Outcomes Network (CSORN), Board Member (2012 to present)

International

Cadotte D. FIENS, the Federation for International Education in Neurological Surgery Communications committee (March 2013 to present)

Evaniew N. Current member, AOSpine Knowledge Forum for Spinal Cord Injury.

Evaniew N. Chair, Systematic Review Committee and member of Steering Committee for 2022-2023 update (in progress) of Guidelines for the management of patients with acute traumatic spinal cord injuries.

Jacobs WB. Member, Primary Spinal Tumor & Metastasis Global Advisory Board, Cerapedics (2023 - present)

Jacobs WB. AOSpine North America Fellowship Committee, (2022 – present)

Jacobs WB. Chair, AOSpine Global Diploma Training Program Committee, (2023 – present)

Jacobs WB. Member, AOSpine North America Curriculum Planning Committee (2017 to present)

Lewkonja P. AO Spine North American Faculty (2018 to present)

Soroceanu, A. SRS/CSRS Cervical Deformity Task Force (2020 to present)

Soroceanu, A. International Spine Study Group (ISSG), University of Calgary site lead, (2017 to present)

Soroceanu, A. International Spine Study Group (ISSG), Complications Committee – member, Cervical Deformity Committee – member, Realignment Committee – member (2013 to present)

ALBERTA CHILDREN'S HOSPITAL

Dr. Fábio Ferri-de-Barros

It is with profound sorrow that we honour the memory of our colleague, Dr. Fábio Ferri-de-Barros.

Fábio is survived by his wife Natalia Marangoni Ferri de Barros, children Matteo (Maria Luiza), Giovanna, and Nicolas; sisters Marina of Oslo, Norway and Helena and Ana of Ilhabela, Brazil; and parents João and Maria Cecília Ferri de Barros of São Jose dos Campos, Brazil. He is lovingly remembered by many nieces, nephews, extended family, and friends across Canada, Brazil, Australia, USA, and Norway.

Fábio was born on November 3, 1971, in São Paulo, Brazil. He grew up skateboarding, surfing, playing rugby and spearfishing. He also enjoyed traveling around Brazil looking for ever better waves to catch. He met Natalia in 1993 and they continued the adventures ever since.



He obtained his MD from the Faculdade de Ciências Médicas da Santa Casa de São Paulo, then trained in orthopaedic surgery in Brazil. Following that he worked in Ilhabela for five years while enjoying surfing, spearfishing, and the tropical beauty; and where Matteo was born. Their small family embarked on a training journey that took them to various locales in the USA, Australia, and Switzerland. In 2006 Fábio and Natalia, now with Giovanna, headed north to Toronto where they started a new chapter in their lives in Canada.

Fábio completed a Pediatric Orthopaedics and Spine Surgery Fellowship at the Hospital for Sick Children at the University of Toronto, where he also completed a Masters degree. Their growing family, now three with Nicolas, then decamped to Calgary in 2010 where Fábio took a consultant position as one of 2 pediatric spine surgeons for the Calgary zone at the Alberta Children's Hospital.

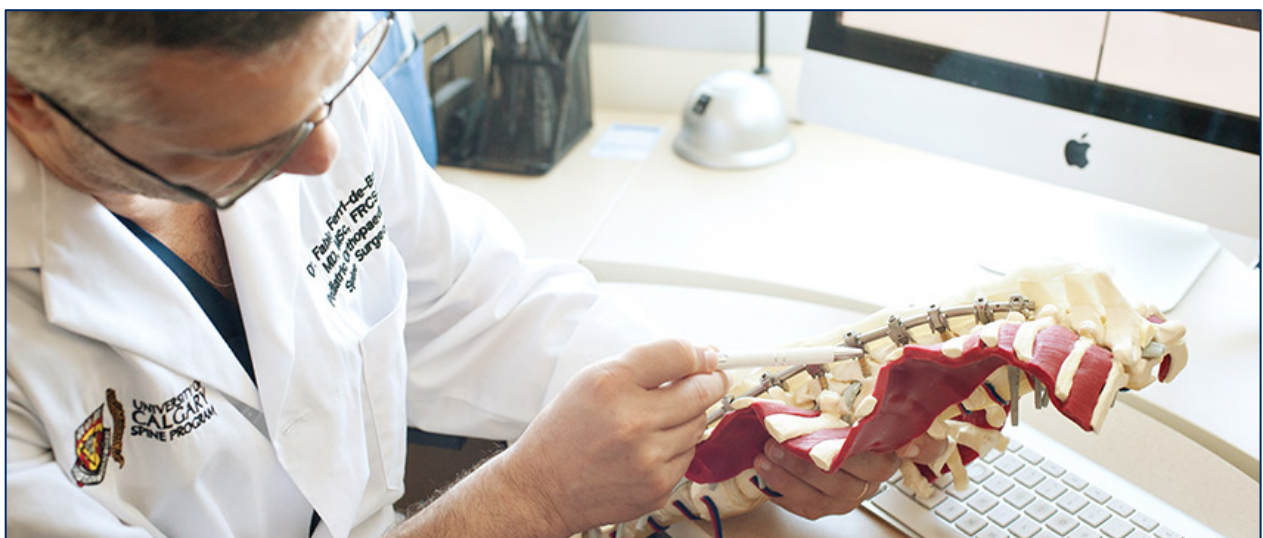


Professionally, Fábio cared deeply for his patients, and worked tirelessly to improve procedures and care for young people with scoliosis. As part of this work, he took on roles which would allow him to do that both in Canada and internationally. Amongst other positions, he was Clinical Professor of Surgery at the Cummings School of Medicine (University of Calgary), and President of the Canadian Pediatric Spine Society. As recognition of his care and integrity, he received numerous awards, and was made Honorary Fellow of the Brazilian Society of Pediatric Orthopaedics.

Fábio was a man of many passions, which included music, surfing, capoeira, snowboarding, cross country skiing, and paddling. He loved doing these things with his family and friends, and he and Natalia enjoyed outrigger canoe races in the UK and Brazil in the last 2 years. Fabio particularly enjoyed being part of the Calgary Canoe Club, who were like family to him. Never one to do anything by half measures, Fábio's team took Silver at the World Sprints in 2022 for the Master's 50+ age division in V12 outrigger canoes, as well as other medals in Brazil.

In the last months of his life, Fábio suffered from an incurable depression, where he was unable to see the love and hope that surrounded him. He was taken by a tragic complication of this severe disease. The family feels it is important to break down the stigma associated with mental health disorders, and would like to encourage anyone in distress to seek help just as they would for any other health issue.

Fábio's passing reminds us of the importance of mental health and well-being within our profession. We must prioritize taking care of ourselves and our colleagues.



EVENTS & INITIATIVES

Canadian Spine Society

In 2023, we finally returned to the in-person format and gathered in Quebec City at the Fairmont Le Château Frontenac. Some of the highlights included:

- Rousing debates that were both educational and highly entertaining.
- Opportunities for renewing connections within the spine community.
- The Canadian Spine Research & Education Foundation (CSREF) held the inaugural Throw Back fundraiser and our own Dr. Bouchard and Dr. Thomas were declared champions!





We were pleased to have several Faculty Members represent the program:

Ben-Israel D, Crawford EJ, Fisher C, Dea N, Spackman E, Rampersaud R, **Thomas KC**. Optimal timing of surgery for symptomatic single-level lumbar disc herniation: a cost effectiveness analysis. Presented by: **Thomas KC** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

Dvorak MF, Evaniew N, Chen M, Waheed Z, Rotem-Kohavi N, Fallah N, Noonan VK, Fisher CG, Charest-Morin R, Dea N, Ailon T, Street J, Kwon BK. The impact of specialized versus nonspecialized acute hospital care on survival among patients with acute incomplete traumatic spinal cord injuries: a population-based observational study from British Columbia, Canada. Presented by: **Evaniew N** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

Evaniew N, *Coyle M, Rampersaud YR, Bailey CS, **Jacobs WB**, **Cadotte DW**, **Thomas KC**, Attabib N, Paquet J, Nataraj A, Christie SD, Weber MH, Phan P, Charest-Morin R, Fisher CG, Hall H, McIntosh G, Dea N. Timing of recovery after surgery for patients with Degenerative Cervical Myelopathy: An observational study from the Canadian Spine Outcomes and Research Network. Presented by: **Evaniew N** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

Evaniew N, *Burger LD, Dea N, **Cadotte DW**, Bailey CS, Christie SD, Fisher CG, Rampersaud YR, Paquet J, Singh S, Weber MH, Attabib N, Johnson MG, Manson N, Phan P, Nataraj A, Wilson JR, Hall H, McIntosh G, **Jacobs WB**. Deterioration after surgery for patients with Degenerative Cervical Myelopathy: An observational study from the Canadian Spine Outcomes and Research Network. Presented by: **Evaniew N** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

Soroceanu A, **Nicholls F**, **Thomas K**, **Evaniew N**, **Bouchard J**, **Salo P**, **Jacobs WB**. Effect of compensation claim status on perioperative outcomes in patients with degenerative spine conditions. Presented by: **Soroceanu A** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023



Soroceanu A, Nicholls F, Thomas K, Evaniew N, Lewkonja P, Bouchard J, Jacobs WB. Economic impact of wait time in degenerative lumbar stenosis surgery: association with time away from work, chronic persistent opioid use, and patient satisfaction. Presented by: **Soroceanu A** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

Soroceanu A, Nicholls F, Thomas K, Evaniew N, Salo P, Bouchard J, Jacobs WB. National adverse event rates following cervical spine surgery for degenerative disorders, and impact on patient satisfaction. Presented by **Soroceanu A** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

Soroceanu A, Nicholls F, Thomas K, Evaniew N, Salo P, Bouchard J, Jacobs B. Predictors of poor postoperative patient satisfaction in elective spine patients with preexisting compensation claims. (Poster) Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

Yang MH, Far R, Sajobi T, Riva-Cambrin J, **Casha S.** Relationship between poor postoperative pain control and surgical outcomes after elective spine surgery. Presented by: **Yang MH** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023

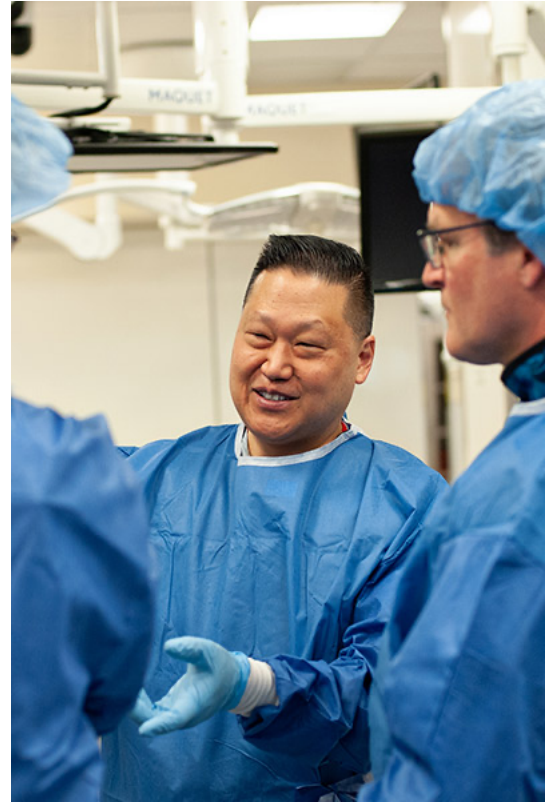
Yang MH, Riva-Cambrin J, Cunningham J, **Casha S.** Preoperative insomnia on poor postoperative pain control after elective spine surgery and the Modified Calgary Postoperative Pain After Spine Surgery (CAPPS) score. Presented by: **Yang MH** (podium). Canadian Spine Society Annual Meeting, Quebec City, QC, March 1-4, 2023



2023 Calgary Spine Program Visiting Professor

We had the pleasure of hosting **Dr. Michael Wang** from the University of Miami as the Calgary Spine Program's 2023 Visiting Professor. Dr. Wang is a pioneer in ultra-minimally invasive spine surgery and developed one of the first Enhanced Recovery After Surgery (ERAS) programs in spinal surgery in North America.

Dr. Wang led an innovative hands-on endoscopic cadaver lab that was attended by spine faculty, fellows, and residents. He delivered two engaging presentations on the "Future of Minimally Invasive Spine Surgery" and "Developing an ERAS Program in Spinal Surgery".





Alberta Spine Foundation

The Alberta Spine Foundation (ASF) is a non-profit organization that was established by the members of the University of Calgary Spine Program and the members of the University of Alberta Spine Program. The objective of the ASF is to advance the delivery of spine care in Alberta through innovative clinical care, focused education, academic research and advocacy.

The ASF is committed to appropriate high-quality spine care and patient advocacy through the development of innovative patient care and spinal surgery referral models. Through our fellowship positions, we offer newly qualified orthopaedic surgeons and neurosurgeons, the opportunity to develop advanced management of complex spine disorders. Finally, the ASF is actively involved in the support of clinical and basic science spinal surgery research via an annual research grant competition.

*Dr. W. Bradley Jacobs
Chair, Alberta Spine Foundation*

Canadian Spine Outcomes Research Network (CSORN)

Under the guidance of Local PI, Dr. Alex Soroceanu, the program continues to contribute to the Canadian Spine Outcomes Research Network (CSORN), the national spine registry of the Canadian Spine Society. CSORN now contains 15,399 enrolments with 1422 added in 2023. Enrollments increased by 20% over last year. The Network contains a variety of spine diagnoses and surgical procedures and reflects a predominantly stenotic cohort of patients. There were 219 enrollments added to the prospective studies in 2023. Our cervical spondylotic myelopathy study is now the largest single CSM dataset in the world.

There were 12 studies published in peer-reviewed medical journals this year; 2 manuscripts have been accepted and are in press. In total, the CSORN group produced 59 in-print/in-press publications. Updates can be found on the [CSORN website](#).



Key future endeavors over the next 12-18 months include:

- Implementation of streamlined surgeon assessment and procedure data collection forms
- Transition from the Global Research Platform (GRP) to Praxis Connect, registry technology that will improve data collection and reporting
- Pursuing large team grants for prospective studies and attain regional grants and bursaries.

Our site enrolled 547 patients into CSORN over the last year with 13 surgeons enrolling consecutive patients. Some are enrolling all eligible surgical patients and others for specific diagnoses only (i.e., CSM). Last year, 62% of our CSORN patients were enrolled from Caleo Health, a multi-disciplinary clinic in the Northwest. 38% of our CSORN patients were enrolled from clinics at Foothills Medical Centre or University of Calgary.

We continue to focus on collecting high-quality data, prioritizing form completion and ongoing patient follow-up with good results. Our completion rates are as follows:

3 mo f/u: 91% End of Study (EOS) 3%
12 mo f/u: 92% EOS 4%
24 mo f/u: 87% EOS 7%



Rick Hansen Spinal Cord Injury Registry

The University of Calgary combined spine program has been an active participant in the Rick Hansen Spinal Cord Injury Registry (RHSCIR) since 2014. Eight hundred and twenty-five new patients have been enrolled through this site, contributing data on acute care and rehabilitation metrics and outcomes. Our program is also an active participant in multi-site sub-study collaborations within the registry, recruiting patients specifically to these initiatives and collecting additional data for those research questions. Recent and on-going projects include Gastrointestinal and Urinary Tract Microbiome after Spinal Cord Injury, Acceptance and Empowerment after Spinal Cord Injury, Liberation from Mechanical Ventilation and implementation of registry collected key performance indicators in spinal cord injury care in Alberta. In addition, the Calgary program has undertaken new studies and innovations in this patient population including: the phase III Minocycline in Acute Spinal Cord Injury (MASC) clinical trial, and the creation of a cerebrospinal fluid and serum tissue bank for the study of biomarkers. Current new activities in this initiative include participation in a multicenter study examining the use of Nerve Transfers to Improve Upper Extremity Function and Quality of Life in Tetraplegic Patients and application of epidural stimulation to restore hemodynamic stability following spinal cord injury.

Dr. Steve Casha

The University of Calgary Spine Program is leading an exciting imaging initiative through the Rick Hansen Spinal Cord Injury Network. Together with collaborators from the Institute of Biomedical Engineering, Ecole Polytechnique de Montréal we are building an MRI library of traumatic spinal cord injury. This national project involves sixteen academic spine centres across Canada and uses some of the most sophisticated data science technology to curate and share imaging data. This library will help researchers understand the pattern of damage to the human cervical spinal cord and will aid in the development of imaging biomarkers to classify patients according to the extent of injured spinal tracts. For example, our incoming Spine Fellow, Dr. Newton Cho (2024-2025 fellowship year) will use this library along with novel imaging analytical techniques to determine what spinal pathways are spared from traumatic injury. We will then determine if single patients may be eligible for novel neurorestorative interventions such deep brain stimulation or bioelectronic implants.

Dr. David Cadotte



Calgary Spinal Cord Injury Program Data

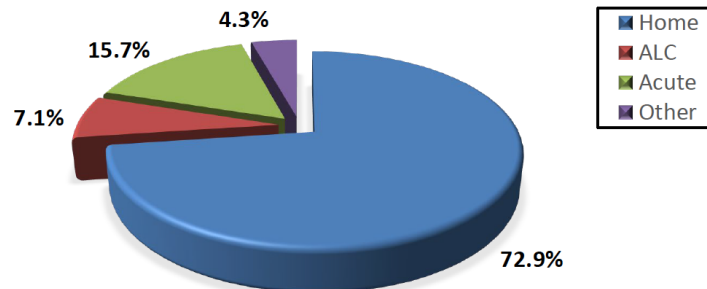
(July 2022 - June 2023)

BASIC DEMOGRAPHICS	Traumatic	Non-Traumatic	Total
Total # of patients discharged	23	47	70
	33%	67%	

ADDITIONAL DEMOGRAPHICS	Traumatic	Non-Traumatic	Total
Average age (years)	48.5	61	56.9
Males	74%	77%	76%
Females	26%	23%	24%

AVERAGE LENGTH OF STAY (LOS) (in # of days)		Traumatic	Non-Traumatic	Total
Acute LOS (Onset Days)		45.1	34.7	39
Tertiary Neuro Rehab Unit	Active LOS	79.2	47	60.3
	Total LOS	91.9	51.5	68.2
Total In-patient LOS		137	86.2	107.2

DISCHARGE DISPOSITION



Additional Notes re: Discharge Disposition

Home → Includes with and without additional health care services (i.e., home care)

ALC (Alternative Level of Care) → Includes long-term care, assisted living, personal care home, etc.

Acute → Includes acute medical units AND transitional units (urban or rural/home hospitals)

FUNCTION SCORES	Traumatic	Non-Traumatic	Total
Functional Independence Measure ® FIM)			
Average Admit FIM Score	65.7	78.2	74.1
Average Discharge FIM Score	87.2	97.8	94.3
Change in FIM Score	32.7%	25.1%	27.3%



Innovations

Enhanced Recovery After Surgery

Dr. Michael Yang and Dr. Peter Lewkonja are developing the first Enhanced Recovery After Surgery (ERAS) Program based on the ERAS Society guidelines for lumbar fusion surgery at the Foothills Medical Center. The goals are to provide standardized evidence-based pre-, intra-, and post-operative care after lumbar fusion surgery to facilitate patient recovery, reduce complications, and the length of hospital stay. We have developed an audit system that can automatically extract clinical information from Connect Care to reduce our reliance on manual data collection. Baseline patient data have been collected between January to June 2023. We anticipate launching our ERAS Program for lumbar fusion patients on July 1st, 2023. This program is also supported by Erin Barrett (QI Specialist), Danielle Michaud (Spine Operational Manager), and our anesthesiology champion, Dr. Kyle Rogan.

Dr. Michael Yang

Researching Degenerative Cervical Myelopathy

Degenerative Cervical Myelopathy (DCM) is the most common cause of spinal cord impairment worldwide, and it is associated with substantial morbidity, social burden, and economic impact. Patients with DCM can experience a variety of neurological symptoms, which range in severity from mild and bothersome to severe and disabling. In appropriately selected patients, surgery reliably halts disease progression and substantially improves quality of life, but many aspects of diagnosis and management remain poorly understood.

The Canadian Spine Outcomes and Research Network (CSORN) runs a nationwide prospective cohort study for patients with DCM, and the CSORN DCM investigators are a highly collaborative group of spine surgeons and researchers from across the country. The CSORN DCM investigators have enrolled more than 1000 patients and published 15 manuscripts since 2015. The University of Calgary Spine Program is the largest enrolling site nationwide, and Drs. Jacobs and Cadotte serve as local Principal Investigators while Dr. Evaniew serves as a national study co-Principal Investigator.



Among the group's recent publications was a study about the timing of recovery that patient's experience after surgery, led by Dr. Evaniew. This paper was featured as an 'Editor's Choice' in the journal *Neurosurgery*, and was presented from the podium at the annual meeting of the Canadian Spine Society in Quebec City and at the international Global Spine Congress in Prague.

Evaniew N, Coyle MJ, Rampersaud YR, Bailey CS, Jacobs WB, Cadotte DW, Thomas KC, Attabib N, Paquet J, Nataraj A, Christie SD, Weber MG, Phan P, Charest-Morin R, Fisher CG, Hall H, McIntosh G, and Dea N. Timing of recovery after surgery for patients with cervical spondylotic myelopathy: An observational study from the Canadian Spine Outcomes and Research Network. *Neurosurgery*. 2023 Feb 1;92(2):271-282.

Dr. Nathan Evaniew



STAFF UPDATES

Welcome to Michael Yang

Dr. Michael Yang obtained his MD from the University of British Columbia. After graduating from medical school in 2014, he completed his neurosurgery residency at the University of Calgary. He obtained a Masters of Science in Health Services Research from the Department of Community Health Sciences at the University of Calgary under the direction of Dr. Jay Riva-Cambrin and Dr. Steven Casha. Following residency, Dr. Yang completed a clinical fellowship in complex and minimally invasive spine surgery at the University of Miami. Dr. Yang joined the Department of Clinical Neurosciences in 2022. Dr. Yang is a full member in the O'Brien Institute of Public Health and is affiliated with the Department of Community Health Sciences.

Dr. Yang's clinical interest in spine surgery include using minimally invasive and endoscopic techniques to treat spinal pathologies. He is leading the development of an Enhanced Recovery After Surgery (ERAS) program in Calgary with the goal of improving postoperative outcomes after spinal and cranial neurosurgery. He is a member of the Enhanced Recovery After Surgery Society and was instrumental in the development of the first ERAS guideline for lumbar fusion surgery. His research interests include efforts to optimize peri-operative outcomes and improving acute pain control after spinal surgery. For his work, he has won numerous international accolades and awards.



DR.
MICHAEL
YANG

SOCIAL EVENTS

The ASF Holiday Party took place at Pasquales on December 3, 2022. A Spring celebration for the graduation of our spine fellows was held June 17, 2023, at Modern Steak. We wish all the best to Dr. Alysa Almojuela, Dr. Martin Gagliardi, Dr. Addison Wood and Dr. James Wu.





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