



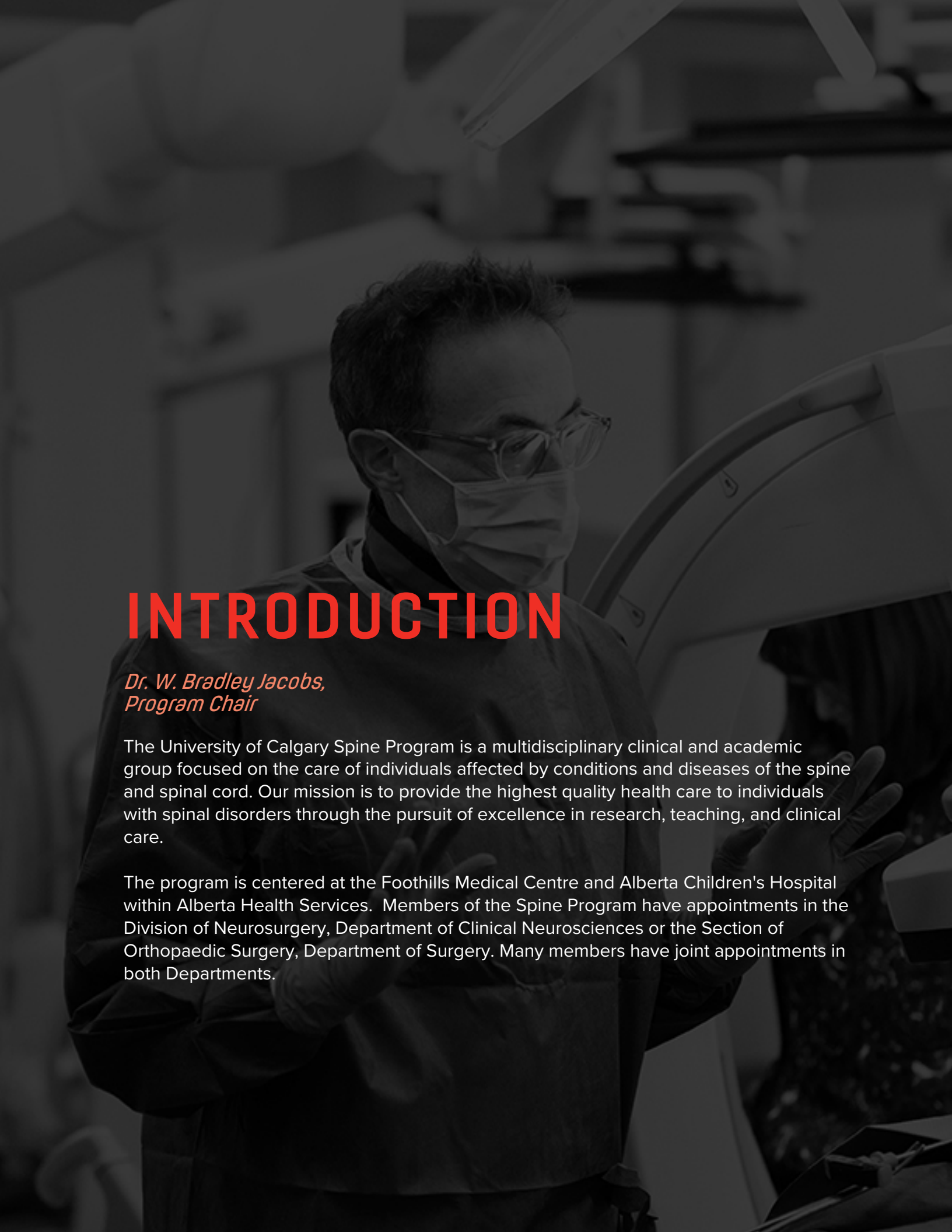
UNIVERSITY OF
CALGARY
SPINE PROGRAM

ANNUAL REPORT

2023-2024

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INTRODUCTION

*Dr. W. Bradley Jacobs,
Program Chair*

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.

Our fellowship is recognized as an AOSpine North America designated fellowship training site, one of only 4 such sites in Canada and 43 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 thoracolumbar approaches to are commonly employed in daily practice.

Dr. Nathan Evaniew leads our research program. There are 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 2023-2024 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, Research Director
- Dr. Peter Lewkonja
- Dr. Fred Nicholls, Fellowship Director
- Dr. Alex Soroceanu
- Dr. Ganesh Swamy
- Dr. Ken Thomas
- Dr. Michael Yang

• Allied Health

- Danielle Michaud, 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
- Erin Fischer, OR nurse clinician

• Nurse Practitioners

- Sadaf Abshar, Neurosurgery
- Ayesha Nurani, Neurosurgery
- Ron Prince, Neurosurgery
- Carla Dean, Orthopaedics
- Nicole Miller, Orthopaedics

• Clinical Surgical Assistants

- Dr. Khurram Khalid Elahi
- Dr. Abi Oseni
- 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
- Michelle Derevyansky, Research Coordinator

● Spine Fellows

- Dr. Abdullah AlDuwaisan
- Dr. Michael Craig
- Dr. Amit Parekh
- Dr. Remi Pelletier-Roy

● Neurosurgery Residents 2023-2024

- | | |
|--|-------------------------------|
| ○ Dr. Madeleine de Lotbiniere-Bassett (R6) | ○ Dr. Catherine Veilleux (R4) |
| ○ Dr. Matthew Eagles (R6) | ○ Dr. Rena Far (R3) |
| ○ Dr. Abdulrahman Albakr (R6) | ○ Dr. Runze Yang (R3) |
| ○ Dr. Jenna Mann (R5) | ○ Dr. Elizabeth Adam (R2) |
| ○ Dr. Branavan Manoranjan (R5) | ○ Dr. Heather Rossong (R2) |
| ○ Dr. Richard Yu (R5) | ○ Dr. Amy Chen (R1) |
| ○ Dr. Brij Karmur (R4) | ○ Dr. Matthew Skarsgard (R1) |

● Orthopaedic Residents 2023-2024

- | | |
|---------------------------------|----------------------------|
| ○ Dr. Annalise Abbott (R5) | Dr. Brodie Ritchie (R3) |
| ○ Dr. Christopher Flanagan (R5) | Dr. Gareth Ryan - Research |
| ○ Dr. Bryan Heard (R5) | Dr. Ethan Sanders (R3) |
| ○ Dr. Christopher Hewison (R5) | Dr. Stephanie Gibbon (R2) |
| ○ Dr. Taryn Ludwig (R5) | Dr. Timothy Lasswell (R2) |
| ○ Dr. Laurel Collings (R4) | Dr. Michael Leslie (R2) |
| ○ Dr. Erin Davison (R4) | Dr. Kaja Matovinovic (R2) |
| ○ Dr. Jarrett Moore (R4) | Dr. Meradith Stadnyk (R2) |
| ○ Dr. Laura Morrison (R4) | Dr. Alyssa Federico (R1) |
| ○ Dr. Julian Rizoz (R4) | Dr. Mallika Makkar (R1) |
| ○ Dr. Logan Woods (R4) | Dr. Reva Qui (R1) |
| ○ Dr. Manjot Birk (R3) | Dr. Colin Rey (R1) |
| ○ Dr. Anna-Lee Policicchio (R3) | Dr. Ben Wadja (R1) |

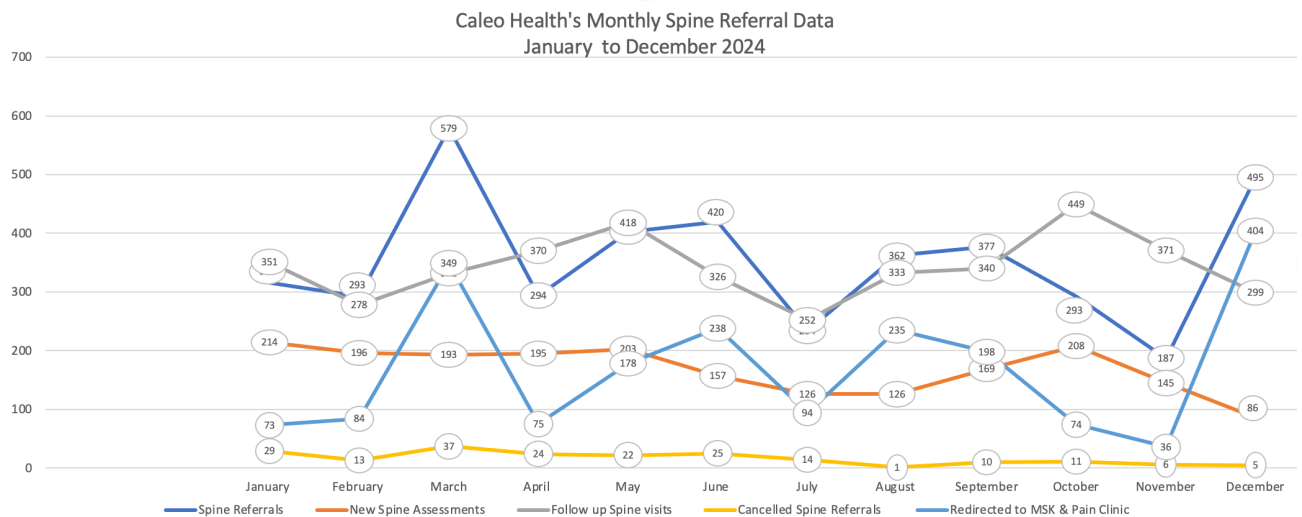


CLINICAL ACTIVITY

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. Lewkonia, Dr. Nicholls, Dr. Soroceanu, Dr. Swamy and Dr. Thomas.
- Spine Triage Physicians include Dr. Soumbasis, Dr. Eckenswiler, Dr. Meerholz and Dr. Fleck.
- Caleo received approximately 4600 referrals in 2024.
- The average wait time for spine assessment was approximately 3-4 months in 2024, consistent with 2023.
- In 2024, patients were provided their spine assessment appointment date within 5 -10 business days of completing the spine registration.
- In 2024, 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 2024 require further referral to a spine surgeon, a similar referral pattern to 2023. The other 50-55% received a referral for physical rehabilitation, pain management or other conservative treatment options.
- All spine patients are provided the option to follow up with the triage physician PRN until discharged from the spine clinic.

- In 2024, wait time from spine assessment to surgical consult was approximately 12–18 months, consistent with 2023.
- Pre-Spine Assessment Pain Management Education Sessions were delivered online, with approximately 15% of registered patients attending.
- For those patients unable to register for a spine assessment, access to the MSK & Pain Clinic was offered, along with treatment recommendations based on specialist document review and eConsultation.

*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 20 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 2 years, the clinic received approximately 8600 referrals from the community and other specialists. In that same period, the median wait time from referral to the initial appointment was 310 days and 4500 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. Physicians respond to enquiries for all Alberta Health Services hospitals including Calgary, Southern Alberta, Eastern British Columbia and Southwestern Saskatchewan.

Surgical Services

Foothills Medical Centre (FMC), Alberta Health Services

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.

Surgeries by procedure code from 1-Jul-2023 to 30-Jun-2024 listed for the following surgeons: Bouchard, Cadotte, Casha, Cho, du Plessis, Evaniew, Jacobs, Lewkonja, Nicholls, Salo, Soroceanu, Swamy, Thomas and Yang.

PROCEDURE GROUP	2023/2024
Cerv Anterior Procedures (corpectomy, arthroplasty, arthroplasty/fusion, ACDF)	226
Cerv fusion/combined approach ant/post	8
Cerv Postr Fusion/Inst	120
Cerv Postr Decompression (includes MIS)	86
Tho/Lum Ant Arthroplasty	16
Tho/Lum Ant Arthroplasty w/Fusion	8
Tho/Lum Ant Fusion	30
Tho/Lum Postr Decompression	424
Tho/Lum Postr Decompression MIS	294
Tho/Lum Postr Fusion MIS	56
Tho/Lum Postr Fusion/Inst 1-3 levels	208
Tho/Lum Postr Fusion/Inst 4+ levels	96
Tho/Lum Fusion Combined Ant & Post	6
Tho/Lum OLIF	45
Tho/Lum DLIF 1-3 levels	50
Tho/Lum DLIF 4+ levels	12
Hardware removal	11
I & D, Debridement	28
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)	46
TOTALS	1770

Clearpoint Health Network

Clearpoint is a non-hospital chartered surgical facility equipped to perform a comprehensive range of orthopaedic surgical procedures, including total joint replacements and spinal procedures

Between 1-Jul-2023 and 30-Jun-2024, several of our surgeons, including Dr. Bouchard, Dr. Cho, Dr. Nicholls, Dr. Salo and Dr. Thomas, completed cases at Clearpoint for various payors, including a small footprint of AHS cases.

PAYOR	2023/2024
AHS	10
WCB	28
RCMP	3
Horizon Surgical	42
TOTALS	83



Inpatient Spine Care

Unit 101 – Foothills Medical Centre

A Commitment to Excellence in Spine Care

Unit 101 at Foothills Medical Centre leads the provision of spine care for southern Alberta. This specialized unit is dedicated to delivering safe, consistent, and compassionate care to patients with spinal cord injuries and other spine-related conditions. The commitment to patient safety and high-quality care is evident in every aspect of the unit's operations, from the adoption of innovative technologies to the expertise and dedication of its staff.

Consistent Leadership

One of the cornerstones of Unit 101's success is its consistent leadership. Over the past year, the leadership team has remained stable, providing a strong foundation for the unit's ongoing initiatives and improvements. This consistency has fostered a sense of stability and trust among the staff, enabling them to focus on delivering the best possible care to their patients.

Staff Engagement and Support

101 staff members recently starred in a video aimed at supporting non-expert professionals in the care of persons with spinal cord injury. This initiative underscores the unit's commitment to education and collaborative care, ensuring that healthcare providers across the province are equipped with the knowledge and skills necessary to deliver exceptional care to this vulnerable patient population.

Innovative Implementations

Unit 101 has also been at the forefront of implementing new tools and products designed to enhance patient care. Among the recent additions are:

- **Nanosalv:** A cutting-edge wound device in the form of a gel designed in Alberta by Albertans, promoting healing and managing microbial load.
- **Vapro Plus Pocket:** An advanced catheter system that improves patient comfort and safety, making the catheterization process more efficient and less invasive.

- **Sage Comfort Bath:** A comprehensive bathing system that ensures patient hygiene and comfort, providing a soothing and thorough cleansing experience.
- **Vein Finder:** A device that assists healthcare professionals in locating veins more efficiently, improving the ease and success of IV insertions and reducing patient discomfort.

Unit 101 at Foothills Medical Centre continues to strive to improve, and to provide safe, consistent, and high-quality care. Through stable leadership, innovative implementations, and a strong commitment to staff engagement and education, the unit continues to set the standard for spine care. The dedication and hard work of the entire team ensure that patients receive the best possible care, fostering hope and healing for those with spinal cord injuries and other spine-related conditions.

*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 7th year, we continued multi-disciplinary rounds with spine surgeons, anesthesiologists, and pain management specialists. This year we also began to incorporate more consistent pre-op referrals to other specialties, including geriatrics and obesity management, with discussion of their assessments being included in our overall pre-op optimization and surgical planning process.

On the second Thursday of the month, we meet to discuss pre-operative patients, and review suitability for surgery. We have continued to notice a frequent change in plans after the meeting, or an increased level of confidence based on group consensus with the surgical plan. 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 79 pre-op patients and 80 post-op patients in the past 12 months. While many of these patients underwent surgical correction of their spinal deformity, some had underlying spinal deformities but underwent smaller operations (e.g., decompressions) initially; cumulatively, our volumes continue to be high.

The complex spine anesthesia service (CSAG) that was created in 2022, 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 continued to collaborate on in conjunction with this specialized team.

In addition to CSAG, we have continued to attempt to improve several other aspects of pre-operative optimization for 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 pre-op narcotics. In addition, they continue to focus on their Acceptance-Commitment Therapy process and pain teaching (before surgical intervention) in order to improve post-op outcomes by way of improving

psychological metrics of importance, such as catastrophizing, kinesiophobia, anxiety and depression, which play an integral role in post-op outcomes in this complex patient population. Surgery then results 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 completed and the process to publish the data in an academic journal is underway. A much larger prospective study is also on the horizon.

In an attempt to better coordinate our national efforts in the early stages of implementing the Adult Spinal Deformity sub-study of the CSORN national database, our site spearheaded a Modified Delphi procedure to assist in the decision-making process. This involved a 3-stage question formulation and consensus process with a subset of deformity spine surgeons from across the country, with a goal of streamlining the future research focus for the sub-study, and culminated in a small group meeting at the annual Canadian Spine Society conference in Whistler. The 4 major research themes that emerged from this process are now the focus of smaller subsets of surgeons, with specific interest in each of those research topics, and we are currently engaged in the process of updating the data we are collecting in an attempt to properly tackle those research questions that were deemed to be of most interest to the national group of deformity spine surgeons.

With the help of some of our surgical fellows this past year, we have also made progress on some of our several local research endeavors relating to better understanding adult spinal deformity, and eventually moving towards improved treatment options and better patient outcomes following surgical corrections.

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 (Eckenswiller, 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*



A black and white photograph of a man with a full beard and glasses, wearing a white t-shirt. He is gesturing with both hands as if speaking or explaining something. The background is dark and out of focus.

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:

- Kalum Ost, MSc awarded 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

- Abdul Al-Shawwa, MSc awarded 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

Dr. Ganesh Swamy, Supervisor:

- Bader, Taylor. PhD. Biomedical Sciences 2023-2027. Proteomics, Degradomics and In-Situ Genomics to Explain Differences Between Annulus Fibrosus Mechanical Properties.
- Bangsbo, 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.



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 and academic experience with an overall goal of training surgeons in the diagnosis and management of diseases of the spine. The University of Calgary Spine program is proud to be an AO sponsored fellowship program; our fellows are fully engaged in the AO Spine Fellowship and Global Spine Diploma curriculae, gaining exposure to other global leaders in spine surgery and attending the annual AO Spine fellows' course and forum.

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, Minimally Invasive and Endoscopic 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

The Fellowship academic 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 over three OR days per week, along with once 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. Over 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.

*Dr. Fred Nicholls,
Fellowship Director*



Adult Spine Fellows 2023 – 2024

Dr. Abdullah AlDuwaisan

Dr. Michael Craig

Dr. Amit Parekh

Dr. Remi Pelletier-Roy



Fellowship Testimonial

The Calgary Spine Fellowship was a pivotal chapter in my professional development. Right from the start, it was clear that this program prioritized fellow training and education. It is designed to cultivate not just technical excellence, but also the confidence and judgment essential to becoming a truly independent spine surgeon. The case mix was comprehensive, with close to 400 surgical cases in just twelve months, incorporating open, minimally invasive, anterior, posterior, and lateral approaches. Call was a challenging variety of trauma, metastatic tumors and infection cases. This provided invaluable experience in managing acute spine pathology and navigating complex decision-making. It gave me a realistic and well-rounded understanding of what it takes to handle call at a high-volume academic center.

What stood out most was the balance between supervision and autonomy. The faculty trusted us to grow, providing just the right amount of guidance while encouraging leadership in the OR. This approach challenged me to refine my decision-making and surgical efficiency, while accelerating my growth by clearly highlighting areas where I needed to improve. The academic component of the program was equally robust, featuring resident teaching sessions, fellow discussion rounds, complex deformity case reviews, journal clubs, and strong support for research.

This program not only prepared me clinically - it played a defining role in shaping me as a spine surgeon and as a collaborative team member in the operating room. I'm proud and grateful to have had the opportunity to be part of the Calgary Spine Program, and I will carry the lessons learned from this fellowship with me throughout my career.

Dr. Remi Pelletier-Roy



RESEARCH

*DR. NATHAN EVANIEW,
RESEARCH DIRECTOR*

Our 2023-2024 academic year for the University of Calgary Spine Program was marked by continued research excellence. Faculty members authored 59 peer-reviewed publications, were principal investigators or collaborators on 8 externally funded research grants collectively worth over \$1,000,000, and led or contributed to 30 abstracts presented at national or international meetings. Our program supervised successful research projects for all four of our spine fellows, and also provided research experiences for many residents, medical students, undergraduate students, and graduate students.

During this period, Dr. Yang, Dr. Thomas, and team were awarded 8.2 million dollars from the Calgary Healthy Foundation to establish a Calgary Endoscopic Spine Surgery and Early Recovery After Surgery (ERAS) program. This program includes a major research component to formally study both endoscopy and ERAS, which allowed the expansion of our program to hire an additional research coordinator, Anand Masson.

We introduced semi-annual Faculty Research and Development nights, which are dinner meetings to foster collaboration, discussion, and engagement. Our Fall 2023 and Spring 2024 featured presentations by Dr. David Cadotte, Dr. Michael Yang, Dr. Richard Hu, and Dr. Ganesh Swamy. Fall of 2023 also saw the re-introduction of our research newsletter, which is used to communicate updates about our ongoing research activities and showcase our recent publications, presentations, and other outputs.

Members of the University of Calgary Spine Program continue to foster many important collaborations. Locally, these include relationships with basic scientists in musculoskeletal and neuroscience translational research through the McCaig Institute for Bone and Joint Health and the Hotchkiss Brain Institute at the University of Calgary. Nationally, they include participation in large national prospective observational studies via the Canadian Spine Outcomes and Research Network and the Praxis Spinal Cord Institute. Internationally, we contributed to the Deformity and Spinal Cord Injury Knowledge Forums of AO Spine.

As part of the Alberta Spine Foundation, the University of Calgary Spine Program also created and awarded a two-year Graduate Student Award, and continued to offer Summer Studentships, and funding for pilot and operating grants. None of this could ever be possible without the support of our outstanding team of research personnel (2023-2024): Saswati Tripathy, Victoria Smith, Michelle Derevyansky, Anand Masson, and Tara Whittaker (Research Manager). We are incredibly grateful for the expertise, creativity, dedication, and organization.



2023-2024 RESEARCH PROJECTS

Prospective Randomized Clinical Trials

Immunotherapy for Acute SCI (Abbvie)	Jacobs	In follow-up
Cerapedics: i-FACTOR Study	Jacobs	In follow-up

Clinical Studies – Observational

Cervical Myelopathy (CSORN)	Cadotte	Enrolling/data collection
Ant vs posterior surgery for lumbar isthmic spondy	Thomas	Enrolling/data collection
Indirect Decompression in the Surgical Treatment DLS	Thomas	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 DCM (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
Effects of obesity on outcomes after degen lumb spine surg	Evaniew	Analysis
Outcomes of anterior lumbar disc replacement	Bouchard/Ludwig	Enrolling/data collection
Imaging Biomarkers in spinal cord injury-Imaging library of acute traumatic SCI	Cadotte	Enrolling/data collection
Association between poor postoperative pain control and length of hospital stay	Yang/Casha	Under Review
Intradiscal hydrogel failure leading to neurological injury	Yang	
MCID for NDI	Evaniew	Under Review
How patients who have had their preoperative expectations met vs those that have not differ from one another	Thomas/Singh	Enrolling/data collection
Development of a patient Decision Aide in Adult Spinal Deformity	Swamy/Cates	Enrolling/data collection
CSORN Deformity Modified Delphi Research Question Planning Procedure	Smith/Swamy	Enrolling/data collection
Impact of an outpatient group pain education and psychotherapy program in spine surgery patients	Eckenswiler/Swamy	Enrolling/data collection

Interventions to Modify Maladaptive Psychological Traits in Patients Undergoing Spine Surgery: A Systematic Review	Skarsgard	Under Review
Mobilization – Lumbar Fusion surgery patients	Yang/Lewkonina	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		
Normative Sagittal Alignment of the Spine: Description of the Inflection Pelvic Angles in Asymptomatic Individuals	Pelletier-Roy/Nicholls	Manuscript prep
Automated MRI detection and prediction of clinical worsening in mild CSM patients	Craig/Cadotte	Edits
National adverse event rates after cervical spine surgery for degenerative disorders, and impact on patient satisfaction	Craig/Soroceanu	Manuscript prep
Effect of Forteo (Teriparatide) in reducing osteoporosis related complications in spine deformity patients	Parekh/Sanders/Nicholls	Manuscript prep
Acceptance and commitment therapy (ACT) for patients with degenerative spinal disorders: an observational study	Alduwaisan/Evaniew	Manuscript prep
Effectiveness of an MDT Driven Preoperative Weight Loss Program on Outcomes in Adult Spine Surgery	Alduwaisan/Nicholls	Ethics
Inter-rater reliability in KEOPS	Smith	Analysis
Microbial colonization of orthopedic and spinal implants	Nicholls/Ostertag	Enrolling/data collection
How does the Ames Cervical Deformity class. apply to the normal pop?	Cowley/Nicholls	Edits
Submitted to Ethics		
Calgary Endoscopic Spine Surgery: CSORN Registry Sub-Study	Yang/Thomas/Casha/du Plessis	Ethics
Effect of Childbearing on Spinopelvic Alignment (EChOS)	Nicholls	Ethics
Activity parameters in normative population and adult spine deformity patients	Nicholls	Ethics

Published Manuscripts

1-Jul-2023 to 30-Jun-2024

Peer-Reviewed Publications (Bold denotes Calgary Spine Program Faculty,

** denotes Calgary Spine Fellow):*

2024

1. *Aldahamsheh O, Alhammoud A, Halayqeh S, **Jacobs WB**, **Thomas KC**, **Nicholls F**, **Evaniew N**. Stand-Alone Anchored Spacer vs Anterior Plate Construct in the Management of Adjacent Segment Disease after Anterior Cervical Discectomy and Fusion: A Systematic Review and Meta-Analysis of Comparative Studies. *Global Spine J.* 2024 Apr;14(3):1038-1051. doi: 10.1177/21925682231201787. Epub 2023 Sep 13. PMID: [37705344](#); PMCID: PMC11192131.
2. Al-Shawwa A, *Craig M, Ost K, Tripathy S & **Cadotte D**. (2024). Machine learning based approach to improving the prediction of neurological deterioration in mild Degenerative Cervical Myelopathy. *Canadian Journal of Neurological Sciences / Journal Canadien des Sciences Neurologiques.* 51. [S46-S46](#). 10.1017/cjn.2024.212.
3. Al-Shawwa A, *Craig M, Ost K, Anderson D, **Jacobs WB**, **Evaniew N**, **Tripathy S**, **Bouchard J**, **Casha S**, **Cho R**, **du Plessis S**, **Lewkonja P**, **Nicholls F**, **Salo PT**, **Soroceanu A**, **Swamy G**, **Thomas KC**, **Yang MMH**, **Cadotte DW**. Focal compression of the cervical spinal cord alone does not indicate high risk of neurological deterioration in patients with a diagnosis of mild degenerative cervical myelopathy. *J Neurol Sci.* 2024 Jun 15;461:123042. doi: 10.1016/j.jns.2024.123042. Epub 2024 May 9. PMID: [38788286](#).
4. Al-Shawwa A, Ost K, Anderson D, *Cho N, **Evaniew N**, **Jacobs WB**, Martin AR, Gaekwad R, Tripathy S, **Bouchard J**, **Casha S**, **Cho R**, **du Plessis S**, **Lewkonja P**, **Nicholls F**, **Salo PT**, **Soroceanu A**, **Swamy G**, **Thomas KC**, **Yang MMH**, Cohen-Adad J, **Cadotte DW**. Advanced MRI metrics improve the prediction of baseline disease severity for individuals with degenerative cervical myelopathy. *Spine J.* 2024 Sep;24(9):1605-1614. doi: 10.1016/j.spinee.2024.04.028. Epub 2024 Apr 26. PMID: [38679077](#).
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6. Alvi MA, Kwon BK, Hejrati N, Tetreault LA, **Evaniew N**, Skelly AC, Fehlings MG. Accuracy of Intraoperative Neuromonitoring in the Diagnosis of Intraoperative Neurological Decline in the

Setting of Spinal Surgery–A Systematic Review and Meta–Analysis. *Global Spine J.* 2024 Mar;14(3_suppl):105S–149S. doi: 10.1177/21925682231196514. PMID: [38632716](#); PMCID: PMC10964897.

7. Ani F, Ayres EW, **Soroceanu A**, Mundis GM, Smith JS, Gum JL, Daniels AH, Klineberg EO, Ames CP, Bess S, Shaffrey CI, Schwab FJ, Lafage V, Protosaltis TS; International Spine Study Group. Functional Alignment Within the Fusion in Adult Spinal Deformity (ASD) Improves Outcomes and Minimizes Mechanical Failures. *Spine (Phila Pa 1976)*. 2024 Mar 15;49(6):405–411. doi: 10.1097/BRS.0000000000004828. Epub 2023 Sep 12. PMID: [37698284](#).
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12. Chan V, Shumilak G, Jafari M, Fehlings MG, **Yang MMH**, Skaggs DL. Risk stratification for early postoperative infection in Pediatric spinal deformity correction: development and validation of the Pediatric scoliosis infection risk score (PSIR score). *Eur Spine J*. 2024 Jun 10. doi: 10.1007/s00586-024-08359-7. Epub ahead of print. PMID: [38858267](#).
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41. **Yang MMH**, Far R, Riva-Cambrin J, Sajobi TT, **Casha S**. Poor postoperative pain control is associated with poor long-term patient-reported outcomes after elective spine surgery: an observational cohort study. *Spine J.* 2024 Sep;24(9):1615-1624. doi: 10.1016/j.spinee.2024.04.019. Epub 2024 Apr 28. PMID: [38685277](#).

1. Ajoku U, Johnson MG, McIntosh G, **Thomas K**, Bailey CS, Hall H, Fisher CG, Manson N, Rampersaud YR, Dea N, Christie S, Abraham E, Weber MH, Charest-Morin R, Attabib N, le Roux A, Phan P, Paquet J, **Lewkonja P**, Goytan M. Temporal analysis of complication rates of cervical spine surgery for degenerative spine disease between younger and older cohorts using the CSORN registry: Is age just a number? *Eur Spine J*. 2023 Oct;32(10):3583-3590. doi: 10.1007/s00586-023-07882-3. Epub 2023 Aug 18. PMID: [37596474](#).
2. Ayling OG, Ailon T, Craig M, Dea N, McIntosh G, Abraham E, Jacobs WB, Johnson MG, Paquet J, Yee A, Hall H, Bailey C, Manson N, Rampersaud YR, Thomas K, Fisher CG. Patient-Reported Outcomes Following Surgery for Lumbar Disc Herniation: Comparison of a Universal and Multitier Health Care System. *Global Spine J*. 2023 Sep;13(7):1695-1702. doi: 10.1177/21925682211046961. Epub 2021 Sep 25. PMID: [34569331](#); PMCID: PMC10556920.
3. Banaszek D, McIntosh G, Charest-Morin R, Abraham E, Manson N, Johnson MG, Bailey CS, Rampersaud YR, Glennie RA, Paquet J, Nataraj A, Weber MH, Christie S, Attabib N, **Soroceanu A**, Kelly A, Hall H, **Thomas K**, Fisher C, Dea N. Practice Variation between Salaried and Fee-for-Service Surgeons for Lumbar Surgery. *Can J Neurol Sci*. 2023 Jul;50(4):604-611. doi: 10.1017/cjn.2022.259. Epub 2022 Jun 16. PMID: [35705195](#).
4. Bourget-Murray J, Piroozfar S, Smith C, Ellison J, Bansal R, Sharma R, **Evaniew N**, Johnson A, Powell JN. Annual incidence and assessment of risk factors for early-onset deep surgical site infection following primary total knee arthroplasty in osteoarthritis. *Bone Joint J*. 2023 Sep 1;105-B(9):971-976. doi: 10.1302/0301-620X.105B9.BJJ-2022-1293.R1. PMID: [37654121](#).
5. Diebo BG, Tataryn Z, Alsoof D, Lafage R, Hart RA, Passias PG, Ames CP, Scheer JK, Lewis SJ, Shaffrey CI, Burton DC, Deviren V, Line BG, **Soroceanu A**, Hamilton DK, Klineberg EO, Mundis GM, Kim HJ, Gum JL, Smith JS, Uribe JS, Kelly MP, Kebaish KM, Gupta MC, Nunley PD, Eastlack RK, Hostin R, Protopsaltis TS, Lenke LG, Schwab FJ, Bess S, Lafage V, Daniels AH; the International Spine Study Group. Height Gain Following Correction of Adult Spinal Deformity. *J Bone Joint Surg Am*. 2023 Sep 20;105(18):1410-1419. doi: 10.2106/JBJS.23.00031. Epub 2023 Jul 21. PMID: [37478308](#).
6. Dvorak MF, **Evaniew N**, Chen M, Waheed Z, Rotem-Kohavi N, Fallah N, Noonan VK, Fisher C, Charest-Morin R, Dea N, Ailon T, Street J, Kwon BK. Impact of Specialized Versus Non-Specialized Acute Hospital Care on Survival Among Patients With Acute Incomplete Traumatic Spinal Cord Injuries: A Population-Based Observational Study from British Columbia, Canada. *J Neurotrauma*. 2023 Dec;40(23-24):2638-2647. doi: 10.1089/neu.2022.0496. Epub 2023 Aug 16. PMID: [37294210](#); PMCID: PMC10698776.

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8. Hathi K, Bigney E, Richardson E, Alugo T, El-Mughayyar D, Vandewint A, Manson N, Abraham E, Small C, **Thomas K**, Fisher CG, Rampersaud YR, Hall H, McIntosh G, Johnson MG, Bailey CS, Weber MH, Paquet J, Kingwell S, Nataraj A, Finkelstein J, Kelly A, Attabib N. Minimally Invasive vs. Open Surgery for Lumbar Spinal Stenosis in Patients with Diabetes – A Canadian Spine Outcomes and Research Network Study. *Global Spine J*. 2023 Jul;13(6):1602–1611. doi: 10.1177/21925682211042576. Epub 2021 Aug 31. PMID: [34463136](#); PMCID: PMC10448101.

9. Lafage R, Smith JS, **Soroceanu A**, Ames C, Passias P, Shaffrey C, Mundis G, Alshabab BS, Protopsaltis T, Klineberg E, Elysee J, Kim HJ, Bess S, Schwab F, Lafage V; International Spine Study Group (ISSG). Predicting Mechanical Failure Following Cervical Deformity Surgery: A Composite Score Integrating Age-Adjusted Cervical Alignment Targets. *Global Spine J*. 2023 Oct;13(8):2432–2438. doi: 10.1177/21925682221086535. Epub 2022 Mar 29. PMID: [35350922](#); PMCID: PMC10538337.

10. Passias PG, Williamson TK, Mir JM, Smith JS, Lafage V, Lafage R, Line B, Daniels AH, Gum JL, Schoenfeld AJ, Hamilton DK, **Soroceanu A**, Scheer JK, Eastlack R, Mundis GM, Diebo B, Kebaish KM, Hostin RA Jr, Gupta MC, Kim HJ, Klineberg EO, Ames CP, Hart RA, Burton DC, Schwab FJ, Shaffrey CI, Bess S, On Behalf Of The International Spine Study Group. Are We Focused on the Wrong Early Postoperative Quality Metrics? Optimal Realignment Outweighs Perioperative Risk in Adult Spinal Deformity Surgery. *J Clin Med*. 2023 Aug 26;12(17):5565. doi: 10.3390/jcm12175565. PMID: [37685633](#); PMCID: PMC10488913.

11. Power JD, Perruccio AV, Canizares M, McIntosh G, Abraham E, Attabib N, Bailey CS, Charest-Morin R, Dea N, Finkelstein J, Fisher C, Glennie RA, Hall H, Johnson MG, Kelly AM, Kingwell S, Manson N, Nataraj A, Paquet J, Singh S, **Soroceanu A**, **Thomas KC**, Weber MH, Rampersaud YR. Determining minimal clinically important difference estimates following surgery for degenerative conditions of the lumbar spine: analysis of the Canadian Spine Outcomes and Research Network (CSORN) registry. *Spine J*. 2023 Sep;23(9):1323–1333. doi: 10.1016/j.spinee.2023.05.001. Epub 2023 May 7. PMID: [37160168](#).

12. Protopsaltis TS, Ani F, **Soroceanu A**, Lafage R, Kim HJ, Balouch E, Norris Z, Smith JS, Daniels AH, Klineberg EO, Ames CP, Hart R, Bess S, Shaffrey CI, Schwab FJ, Lenke LG, Lafage V, Gupta MC. Clinical outcomes and proximal junctional failure in adult spinal deformity patients corrected to normative alignment versus functional alignment. *J Neurosurg Spine*. 2023 Jul 21;39(6):757–764. doi: 10.3171/2023.5.SPINE221266. PMID: [37503890](#).

13. Rosa Filezio M, Peiro-Garcia A, Parsons DL, **Thomas K**, Ferri-de-Barros F. Accuracy of imaging grading in comparison to open laminectomy to evaluate pedicle screws positioning.

Ann Med Surg (Lond). 2023 Nov 17;86(1):199–206. doi: 10.1097/MS9.0000000000001515. PMID: [38222761](#); PMCID: PMC10783280.

14. *Singh V, *Oppermann M, **Evaniew N**, **Soroceanu A**, **Nicholls F**, **Jacobs WB**, **Thomas K**, **Swamy G**. L5–S1 Pseudoarthrosis Rate with ALIF Versus TLIF in Adult Spinal Deformity Surgeries: A Retrospective Analysis of 100 Patients. *World Neurosurg*. 2023 Jul;175:e1265–e1276. doi: 10.1016/j.wneu.2023.04.113. Epub 2023 May 3. PMID: [37146876](#).
15. Smith JS, Kelly MP, Buell TJ, Ben-Israel D, Diebo B, Scheer JK, Line B, Lafage V, Lafage R, Klineberg E, Kim HJ, Passias P, Gum JL, Kebaish K, Mullin JP, Eastlack R, Daniels A, **Soroceanu A**, Mundis G, Hostin R, Protosaltis TS, Hamilton DK, Gupta M, Lewis SJ, Schwab FJ, Lenke LG, Shaffrey CI, Burton D, Ames CP, Bess S; International Spine Study Group. Adult Cervical Deformity Patients Have Higher Baseline Frailty, Disability, and Comorbidities Compared With Complex Adult Thoracolumbar Deformity Patients: A Comparative Cohort Study of 616 Patients. *Global Spine J*. 2023 Nov 10:21925682231214059. doi: 10.1177/21925682231214059. Epub ahead of print. PMID: [37948666](#).
16. **Yang MMH**, Riva-Cambrin J, Cunningham J, **Casha S**. Impact of preoperative insomnia on poor postoperative pain control after elective spine surgery and the modified Calgary postoperative pain after spine surgery (MCAPPS) score. *N Am Spine Soc J*. 2023 Aug 6;16:100261. doi: 10.1016/j.xnsj.2023.100261. PMID: [37753373](#); PMCID: PMC10518606.
17. **Yang MMH**, 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*. 2023 Sep;50(5):687–693. doi: 10.1017/cjn.2022.305. Epub 2022 Oct 24. PMID: [36278829](#).
18. Ye J, Gupta S, Farooqi AS, Yin T, **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. Predictive role of global spinopelvic alignment and upper instrumented vertebra level in symptomatic proximal junctional kyphosis in adult spinal deformity. *J Neurosurg Spine*. 2023 Aug 4;39(6):774–784. doi: 10.3171/2023.6.SPINE23383. PMID: [37542446](#).

Presentations

1-Jul-2023 to 30-Jun-2024

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

2024

1. Amin P, Raj A, McIntosh G, Neilsen C, **Swamy G**, Rampersaud R (poster). The impact of concurrent deformity on patient reported outcome following 1-3 level lumbar surgery no aimed at deformity correction. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
2. Bader T, Dhiman M, Hart D, Duncan N, **Salo P, Swamy G** (poster). Structure-Function Relationships of Degenerative and Degenerative Scoliosis Annulus Fibrosus – a Possible Etiological Factor in Adult Deformities. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
3. Birk M, *Pelletier-Roy R, Ludwig T, **Evaniew N, Lewkonja P, Thomas K, Swamy G, Jacobs WB, Nicholls F** (poster). Inter-rater reliability of partially automated segmentation of spinal radiographs in adult spinal deformity patients using KEOPS. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
4. *Craig M, Al-Shawwa A, Ost K, Tripathy S, **Evaniew N, Jacobs WB, Cadotte D**. Presented by: Craig M (podium). Automated magnetic resonance imaging risk stratification of clinical deterioration in mild cervical myelopathy. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
5. *Craig M, Al-Shawwa A, Ost K, Tripathy S, **Evaniew N, Jacobs WB, Cadotte D**. Presented by: Craig M (podium). Automated magnetic resonance imaging risk stratification of clinical deterioration in mild cervical myelopathy. AO Fellows Forum, Banff, AB, April 11-14, 2024.
6. *Craig M, Guenther M, Valosek J, Bouthillier M, Karthik Enamundram N, Rotem-Kohavi N, Humphreys S, Christie S, Fehlings M, Kwon B, Mac-Thiong JM, Phan P, Paquet J, Guay-Paquet M, Cohen-Adad J, **Cadotte D** (poster). Standardizing a magnetic resonance imaging library of acute traumatic spinal cord injury in Canada. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.

7. Dhiman M, Bader T, Hart D, **Swamy G**, Duncan N (poster). Measuring Differences between Interlamellar Properties of the Annulus Fibrosus from Degenerative Disc Disease and Non-Diseased Young Donor Patients. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
8. Dhiman M, Bader T, Ponjevic D, Matyas J, Hart D, **Swamy G**, Duncan N (poster). Assessing Collagen Damage in Annulus Fibrosus from Degenerative Disc Disease Patients using a Collagen Hybridizing Peptide. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
9. **Evaniew N**, Bailey C, Rampersaud R, **Jacobs WB**, Phan P, Nataraj A, **Cadotte D**, Weber M, **Thomas KC**, Manson N, Attabib N, Paquet J, Christie S, Wilson J, Hall H, Fisher C, McIntosh G, Dea N. Presented by: Evaniew N (podium). Anterior versus posterior surgery for patients with Degenerative Cervical Myelopathy: An observational study from the Canadian Spine Outcomes and Research Network. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
10. Far R, **Casha S**, Riva-Cambrin J, **Yang M**. Effect of poor postoperative pain control on length of hospital stay after elective spine surgery. 2nd Annual NeuroSpine Research Forum, Virtual, 2024
11. Far R, **Casha S**, Riva-Cambrin J, **Yang M**. Effect of poor postoperative pain control on length of hospital stay after elective spine surgery. American Association of Neurological Surgeon Annual Conference, Chicago, USA, 2024
12. Far R, **Casha S**, Riva-Cambrin J, **Yang M**. Effect of poor postoperative pain control on length of hospital stay after elective spine surgery. Congress of Neurological Science Federation, Toronto, Canada, 2024
13. Gopalakrishnan, S, Veilleux C, Far R, **Yang M**. Intradiscal hydrogel causing neurological injury: a case report. 2nd Annual NeuroSpine Research Forum, Virtual, 2024
14. **Jacobs WB**, Mariscal G, Witiw C, Harrop J, Essa A (poster). Meta-analysis of the effects of diabetes mellitus on fusion rates and patient-related outcomes in spinal fusion surgery. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
15. **Jacobs WB**, Witiw CD, Essa A, Harrop JS, Mariscal G (poster). Impact of tobacco on non-union rate and patient-reported outcomes in spinal fusion surgery: A systemic review and meta-analysis. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.

16. Lasswell T, **Hu R**, Bailey C, Siddiqi F, Rasoulinejad P (poster). Cost Savings Analysis Through a Direct-to-Hospital Sales Model for Interbody Cages. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
17. Malhotra A, **Evaniew N**, Dea N, CSORN Investigators, McIntosh G, Wilson J (podium). The effects of perioperative adverse events on clinical and patient-reported outcomes after surgery for degenerative cervical myelopathy: an observational cohort study from the Canadian Spine Outcomes and Research Network. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
18. Ost K, Al-Shawwa A, Anderson D, **Evaniew N**, **Jacobs WB**, **Lewkonja P**, **Nicholls F**, **Salo T**, **Thomas K**, **Yang M**, **Cadotte D** (poster). Can Classical Machine Learning Models Predict Long-Term Degenerative Cervical Myelopathy Outcomes? Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
19. *Parekh A, Sanders E, Birk M, **Nicholls F** (poster). Effect of Forteo (Teriparatide) in reducing osteoporosis related complications in spine deformity patients. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
20. *Parekh A, Sanders E, Birk M, **Nicholls F** (poster). Effect of Forteo (Teriparatide) in reducing osteoporosis related complications in spine deformity patients. AO Fellows Forum, Banff, AB, April 11-14, 2024.
21. *Pelletier-Roy R, Asmussen RM, Birk M, Ludwig T, **Nicholls F**. Presented by: Pelletier-Roy R (podium). T1 Pelvic and Lumbar Pelvic Angles Normative Values: A Prospective Cohort Study of 496 Asymptomatic Volunteers. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
22. *Pelletier-Roy R, Asmussen RM, Birk M, Ludwig T, **Nicholls F**. Presented by: Pelletier-Roy R (podium). T1 Pelvic and Lumbar Pelvic Angles Normative Values: A Prospective Cohort Study of 496 Asymptomatic Volunteers. AO Fellows Forum, Banff, AB, April 11-14, 2024.
23. Rotem-Kohavi N, Dvorak M, Xu J, Fallah N, Waheed Z, Chen M, Dea N, **Evaniew N**, Noonan V, Kwon B (podium). Specialized care is associated with reduced risk for unplanned readmissions following traumatic incomplete spinal cord injury. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
24. Sarraj M, Rajapaksege N, Dea N, **Evaniew N**, McIntosh G, Guha D, Pahuta M (poster). The Relative Importance of Cervical Myelopathy Treatment Outcomes to Spine Surgeons and Family Physicians in Canada; A Discrete-Choice Experiment. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.

25. Shakil H, CSORN Investigators, **Evaniew N**, Wilson J, Dea N (podium). Predictors associated with achieving the minimal clinically important difference in patient-reported outcomes after surgery for degenerative cervical myelopathy: a national multicentre cohort analysis from the Canadian Spine Outcomes and Research Network. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
26. Witiw CD, Harrop JS, **Jacobs WB**, Mariscal G, Essa A (poster). The economic burden of diabetes in spinal fusion surgery: A systematic review and meta-analysis. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
27. Witiw C, Harrop C, **Jacobs WB**, Mariscal G, Essa A (poster). The influence of obesity on spinal nonunion: a systematic review and meta-analysis. Canadian Spine Society Annual Meeting, Whistler, BC, March 1-4, 2024.
28. **Yang MH**, Far R, Sajobi T, Riva-Cambrin J, **Casha S**. Presented by: Yang MH (podium). Relationship between poor postoperative pain control and surgical outcomes after elective spine surgery. International Society for the Advancement of Spine Surgery, Miami, FL, 2024

2023

1. **Soroceanu A, Nicholls F, Thomas K, Evaniew N, Salo P, Bouchard J, Jacobs WB** (podium). Longer wait times for degenerative lumbar surgery are associated with increased time away from work, worse postoperative satisfaction, and higher chronic persistent opioid use. North American Spine Society Annual Meeting, Los Angeles, CA, October 18-21, 2023
2. **Soroceanu A, Nicholls F, Thomas K, Evaniew N, Salo P, Bouchard J, Jacobs B** (podium). Predictors of poor postoperative patient satisfaction in elective spine patients with preexisting compensation claims. North American Spine Society Annual Meeting, Los Angeles, CA, October 18-21, 2023

Grants

1-Jul-2023 to 30-Jun-2024

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. 2023 - 2024. Amount \$44,000

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. 20017-present. Amount \$60,000 renewed annually

Nicholls F (PI). 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 (PI). 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 (Co-PI). Effects of Childbearing On Spinopelvic Alignment (EChOS)

- SPARC Ignite Grant (20,000.00)

Nicholls F (Co-PI). Developing a Machine Learning Model of the Spine for Clinical Applications from Computed Tomography

- Alberta Spine Foundation Grant (75,000.00)

Nicholls F (Co-PI). 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 (Co-PI). Validation of the Femorotibial Ratio using EOS imaging

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

Nicholls F (Co-PI). ACTIVATION: Activity Capture To Investigate Voluntary Activity in Oncology and Normal populations

- SPARC Ignite Grant (20,000.00)

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]

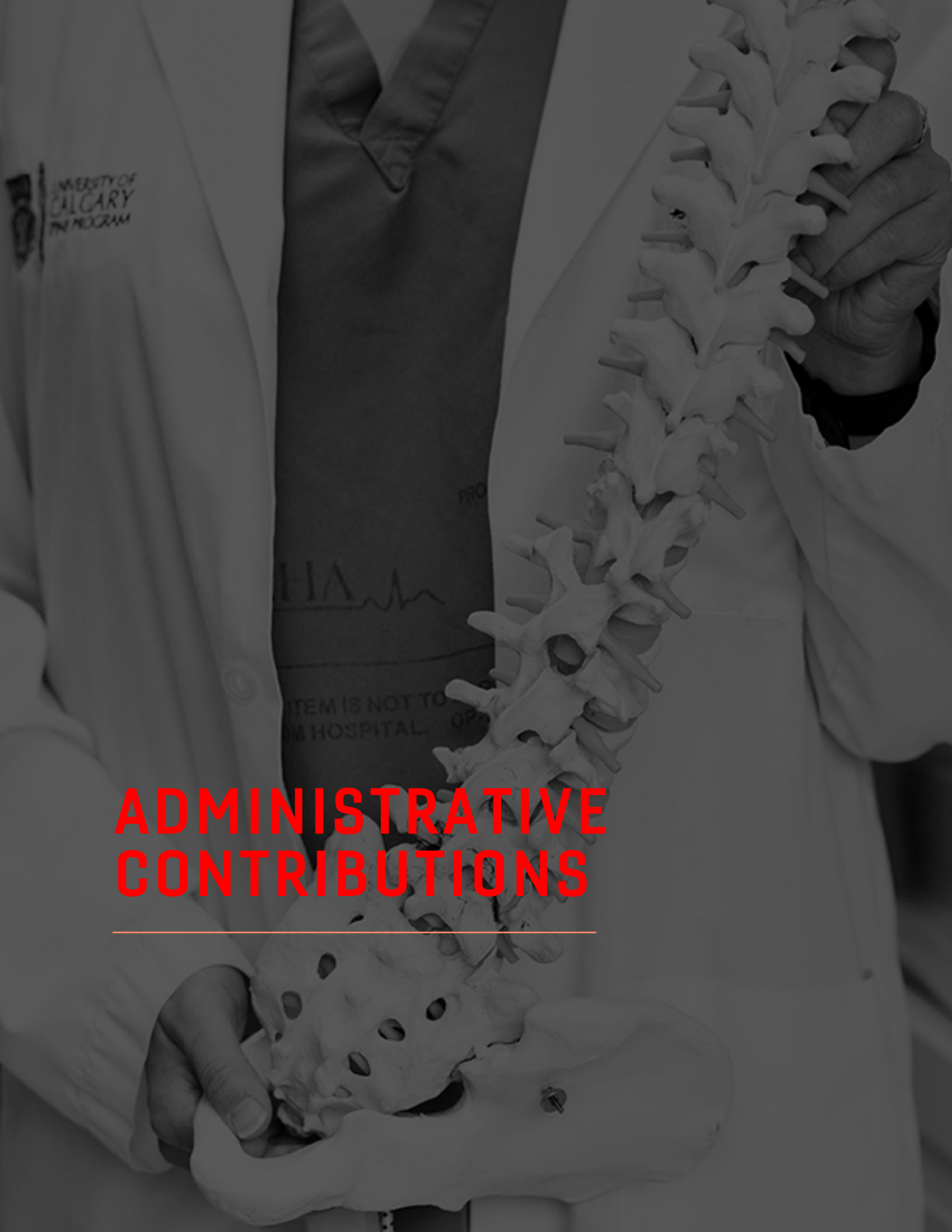
Swamy G. Development of a Patient Decision Aide in Adult Spinal Deformity (\$20 000)

- 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 [2022]
- Clinical Research Fund (CRF) Grant (\$25 000) [2024]

Swamy G. The Mrs. Geraldine and Dr. Samuel Shachnowich Chair in Spinal Disorders Research (\$87 500/pa)



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 2023)

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

Evaniew N. Research Director, University of Calgary Spine Program, Calgary, Alberta (2023 to present)

Evaniew N. Orthopaedic Research Portfolio Committee, University of Calgary Division of Orthopaedic Surgery (2023 to present)

Jacobs WB. Chairperson, University of Calgary Spine Program, Calgary, Alberta (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, Enhanced Recovery After Surgery (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)

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

Lewkonia P. Division of Spine Surgery Lead, Section of Orthopaedics (2018 to 2023)

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

Nicholls F. McCaig Institute for Bone & Joint Health Education Committee (2024 to present)

Nicholls F. Orthopaedic Surgery Residency Program Committee (2023 to present)

Nicholls F. University of Calgary Department of Surgery Fellowship Committee (2019 to 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. University of Calgary Department of Surgery Peer Support Member (Oct 2020 to Sep 2023)

Yang M. Member, DCNS Wellness Committee, University of Calgary (2024 to present)

Yang M. Director, Calgary Endoscopic Spine Surgery, Research and Advancement (CESSRA) Program (2023 to present)

Yang M. Director, Social media, Division of Neurosurgery and Calgary Spine Program, University of Calgary (2023 to present)

Yang M. Member, Connect Care Opioid Optimization Working Group, University of Calgary (2023 to present)

Yang M. Clinical co-lead, Enhanced Recovery After Surgery (ERAS)(2019 to present)

Yang M. Enhanced Recovery After Surgery for Cranial Surgery (2022 to present)

Yang M. Perioperative Pain Management Working Group (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)

Cadotte D. Canadian Spine Outcomes Research Committee. A national consortium of spine surgeons collectively capturing data to improve outcomes for patients with spinal disorders (2017 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 – 2024)

Jacobs WB. Examiner, Royal College of Physicians and Surgeons of Canada
Neurosurgery Oral Examination Development Committee (2024 to present)

Jacobs WB. Examiner, Royal College of Physicians and Surgeons of Canada Spinal
Surgery Area of Focused Competency Diploma Working Group (2022-2024)

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

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

Jacobs WB. Member, Executive Committee, Canadian Spine Society (2013 to present)

Lewkonja P. Canadian Journal of Surgery, Editorial Board, Spine Surgery (2023 to
present)

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

Nicholls F. Program Review Committee – Canadian Spine Society Annual Meeting (2020
to 2024)

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

Casha S. AANS and CNS joint guidelines committee member (2011 to present)

Evaniew N. Teaching Faculty Member – Provisional. AO Spine North America (2023 to present)

Evaniew N. Global Spine Diploma Program Preceptor – Trauma Module. AO Spine North America (2023 to present)

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

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

Jacobs WB. Chair, AOSpine North America Global Spine Diploma 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)

Nicholls F. AO spine North America Education Committee (2024 to present)

Nicholls F. AO spine North America Knowledge Forum, Deformity (2024 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)

EVENTS & INITIATIVES



Canadian Spine Society

The 24th Annual Scientific Conference of the Canadian Spine Society was held at Fairmont Chateau Whistler from February 28 to March 2, 2024. Our trainees presented many abstracts as podium and poster presentations. Our faculty also contributed by leading and moderating multiple sessions.

The Great Debates were of special interest this year as both Dr. Lewkonja and Dr. Evaniew “won” their respective debates on anterior column reconstruction in oncological surgery for spinal metastases and laminectomy alone for Degenerative Cervical Myelopathy.

Dr. Nicholls hosted an informal gathering of past and present Calgary Fellows. What a treat to see so many familiar faces!



Podium 60	Pelletier-Roy, R	T1 Pelvic and Lumbar Pelvic Angles Normative Values: A Prospective Cohort Study of 496 Asymptomatic Volunteers
Podium 61	Craig, Michael	Automated MRI detection and prediction of clinical worsening in mild cervical myelopathy
Podium 11	Evaniew, Nathan	Anterior versus posterior surgery for patients with Degenerative Cervical Myelopathy: An observational study from the Canadian Spine Outcomes and Research Network
P-67	Ost K, Al-Shawwa A, Anderson D, Evaniew N, Jacobs WB, Lewkonja P, Nicholls F, Salo T, Thomas K, Yang M, Cadotte D	Can Classical Machine Learning Models Predict Long-Term Degenerative Cervical Myelopathy Outcomes?
P-68	Sarraj M, Rajapaksege N, Dea N, Evaniew N, McIntosh G, Guha D, Pahuta M	The Relative Importance of Cervical Myelopathy Treatment Outcomes to Spine Surgeons and Family Physicians in Canada; A Discrete-Choice Experiment
P-77	Parekh A, Sanders E, Birk M, Nicholls F	Effect of Forteo (Teriparatide) in reducing osteoporosis related complications in spine deformity patients
P-82	Birk M, Pelletier-Roy R, Ludwig T, Evaniew N, Lewkonja P, Thomas K, Swamy G, Jacobs WB, Nicholls F	Inter-rater reliability of partially automated segmentation of spinal radiographs in adult spinal deformity patients using KEOPS
P-87	Bader T, Dhiman M, Hart D, Duncan N, Salo P, Swamy G	Structure-Function Relationships of Degenerative and Degenerative Scoliosis

		Annulus Fibrosus – a Possible Etiological Factor in Adult Deformities
P-102	Amin P, Raj A, McIntosh G, Neilsen C, Swamy G , Rampersaud R	The impact of concurrent deformity on patient reported outcome following 1-3 level lumbar surgery no aimed at deformity correction
P-105	Dhiman M, Bader T, Hart D, Swamy G , Duncan N	Measuring Differences between Interlamellar Properties of the Annulus Fibrosus from Degenerative Disc Disease and Non-Diseased Young Donor Patients
P-106	Dhiman M, Bader T, Ponjevic D, Matyas J, Hart D, Swamy G , Duncan N	Assessing Collagen Damage in Annulus Fibrosus from Degenerative Disc Disease Patients using a Collagen Hybridizing Peptide
P-141	Jacobs WB , Witiw CD, Essa A, Harrop JS, Mariscal G	Impact of tobacco on non-union rate and patient-reported outcomes in spinal fusion surgery: A systemic review and meta-analysis
P-142	Witiw CD, Jacobs WB , Essa A, Harrop JS, Mariscal G	The economic burden of diabetes in spinal fusion surgery: A systematic review and meta-analysis
P-155	Witiw CD, Harrop JS, Jacobs WB , Mariscal G, Essa A	The economic burden of diabetes in spinal fusion surgery: A systematic review and meta-analysis
P-156	Jacobs WB , Witiw CD, Essa A, Harrop JS, Mariscal G	Meta-analysis of the effects of diabetes mellitus on fusion rates and patient-related outcomes in spinal fusion surgery
P-158	Lasswell T, Hu R , Bailey C, Siddiqi F, Rasoulinejad P	Cost Savings Analysis Through a Direct-to-Hospital Sales Model for Interbody Cages



Dr. Bouchard & Dr. Thomas continued their winning streak and were once again declared champions of the Spine Research & Education Foundation (CSREF) Throw Back fundraiser.



Networking with spine colleagues from across the country and around the world remains a highlight of this annual gathering.

2024 Calgary Spine Program

Visiting Professor

We had the pleasure of hosting **Dr. Nicol s Dea** from the University of British Columbia on June 21, 2024. Dr. Dea is the recipient of multiple national and international awards for his work in oncology and degenerative conditions of the spine. He has authored more than 120 peer-reviewed publications and participated in many textbooks in the field of neurosurgery and spinal surgery.

Dr. Dea's presentations that day included:

- Management of primary spine tumors: Surgery is still the best option
- How to avoid failure as an early career academic surgeon



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 17,863 enrolments, with 1653 added in 2024. Enrollments increased by 5% over last year. The Network contains a variety of spine diagnoses and surgical procedures and reflects a predominantly stenotic cohort of patients. There were 223 enrollments added to the prospective studies in 2024. The CSORN degenerative cervical myelopathy (DCM) study is now the largest single DCM dataset in the world.

There were 10 studies published in peer-reviewed medical journals this year; 4 manuscripts have been accepted and are in press. In total, the CSORN group produced 72 in-print/in-press publications. Updates can be found on the [CSORN website](#).

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

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

Our site enrolled 524 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., DCM). Last year, 63% of our CSORN patients were enrolled from Caleo Health, a multi-disciplinary clinic in the Northwest. 37% 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: 92%, EOS 0.2%

12 mo f/u: 86%, EOS 5%

24 mo f/u: 86%, EOS 9%

EOS (withdrew, LTFU, died, surgery cancelled, new surgery different indication etc.)

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 as deep brain stimulation or bioelectronic implants.

Dr. David Cadotte

Calgary Spinal Cord Injury Neuro Rehab Program Data

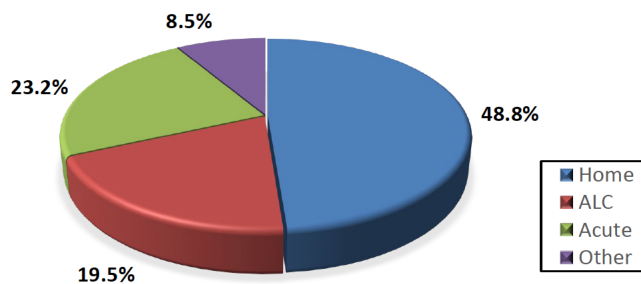
(July 2023 - June 2024)

BASIC DEMOGRAPHICS	Traumatic	Non-Traumatic	Total
Total # of patients discharged	35	47	82
	43%	57%	

ADDITIONAL DEMOGRAPHICS	Traumatic	Non-Traumatic	Total
Average age (years)	45.1	63.7	55.7
Males	66%	64%	65%
Females	34%	36%	35%

AVERAGE LENGTH OF STAY (LOS) (in # of days)	Traumatic	Non-Traumatic	Total
Acute LOS (Onset Days)	46.2	49.1	48.1
Tertiary Neuro			
Rehab Unit			
Active LOS	59.5	44.5	49.4
Total LOS	74.7	53.8	60.6
Total In-patient LOS	120.8	102.9	108.7

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 Functional Independence Measure ® FIM)	Traumatic	Non-Traumatic	Total
Average Admit FIM Score	66.3	77	72.5
Average Discharge FIM Score	86.3	96.7	92
Change in FIM Score	29.0%	25.2%	26.6%

Innovations

Calgary Endoscopic Spine Surgery, Research, and Advancement (CESSRA)

Dr. Michael Yang and Dr. Ken Thomas were successful in winning a transformational 8.2 million dollar award from the Calgary Spine Foundation to build the *Calgary Endoscopic Spine Surgery, Research, and Advancement (CESSRA) Program*. This award will be used to build Alberta's first endoscopic spine surgery program.

Spine endoscopy is an ultra-minimally invasive surgery technique that can address the pathology at hand without destroying surrounding normal anatomy, thus facilitating patient recovery. Surgeries that traditionally required 20mm-100mm incisions can now be done with a 7-10mm incision. Drs. Michael Yang, Ken Thomas, Steven Casha, and Dr. Stephan Du Plessis will receive specialized training in order to offer this innovative surgery to Southern Albertans.

Further, this funding will allow us to create a comprehensive Enhanced Recovery After Surgery (ERAS) Program for spinal surgery. The goal of ERAS is to optimize and standardize patients' care before and after surgery in order to enhance patient recovery, reduce complications, and length of hospital stay. A research program will be developed so we can evaluate the program's impact on patient care and patient outcomes.



Dr. Michael Yang



Anand Oliveira Masson, PhD

We are thrilled to welcome Anand Oliveira Masson, PhD, as CESSRA's dedicated research coordinator. With her expertise and passion for spinal research, Anand will facilitate our clinical research initiatives, driving innovation and excellence in spine care.

Sierra Simms, RN

We are also pleased to introduce Sierra Simms, RN, as our patient nurse navigator. Sierra will play a crucial role in guiding patients through their treatment journey, providing support, education, and personalized care to ensure a seamless and positive experience.





STAFF UPDATES



Patti Sullivan Retires

I met Patti on my first day with the Spine Program in 2002. Little did I know that over the next 22 years, I would visit her cubicle hundreds of times to arrange study visits, seek advice, pick up a paycheck and steal a chocolate from her basket of treats. With her vast experience and many connections, Patti truly became an institution on the 12th floor and in the spine community.

When Dr. John Hurlbert and Dr. Rick Hu founded the University of Calgary Spine Program in 1997, Patti was there. When the Canadian Spine Society was formed in 2000 and began hosting annual Scientific Meetings, Patti was there. When the Alberta Spine Foundation (ASF) was established in 2010, Patti was there to promptly become the Foundation Administrator. After a long and successful career, Patti retired from her roles as the Calgary Spine Program and Alberta Spine Foundation Administrator in June of 2024.

When I sat down to write this tribute to Patti, two things quickly came to mind:

1. Her loyalty. Over her time with the foundation, Patti saw many changes and adapted to very different leadership styles. As staff surgeons cycled through the roles of Program Chair, Research Director and Fellowship Director, Patti supported and guided their efforts. She witnessed both tremendous growth and serious challenges. I specifically appreciated her support when I transitioned into the role of Research Manager. I knew Patti would always have my back. Through it all, Patti's goal was always to support and improve the program.
2. Her attention to detail. Patti kept meticulous records, which I've been thankful for after her departure. She pushed us all to be accurate and complete and she wasn't afraid to point it out if we were off the mark. She always aimed for excellence.

Patti, we congratulate you on your well-deserved retirement. We appreciate your countless contributions to spinal surgery in Alberta. You leave a strong foundation on which we will continue to build.

Enjoy your retirement!
Tara Whittaker

Ken Moghadam Retires

The end of the 2023-24 academic year for the Calgary Spine Program saw the retirement of the longest serving continuous member of the program – Ken Moghadam. Ken provided expert orthotics consultation to the surgeons of the Calgary Spine Program and exceptional orthotics care delivery to our patients over the nearly 30 years since the inception of the program in 1996.



To say that Ken was an expert orthotist, while absolutely true, is a profound understatement when considered against the weight of his true role within the fabric of the Calgary Spine Program. Ken, through his many years of expert care delivery, has been as integral a part of the Calgary Spine Program as any surgeon member. Over the years, Ken applied thousands of halo orthosis, cervical collars and thoracolumbar braces and spend countless hours in the operating theatre assisting surgeons with reductions of complex fractures and deformities. Ken trained a generation of expert orthotists through his leadership of Cascade Orthotics and, through leadership by example, passed on an exceptionally high bar for professional orthotic care delivery to his mentees. Ken's model of highly accessible and reliable orthotics care delivery allowed spinal surgeons in Calgary to successfully treat spinal column fractures with orthotic immobilization and avoid higher risk surgical interventions that would have been required without his expertise. Multiple generations of spinal surgery fellows benefited from Ken's wisdom on the nuances of closed reduction techniques and halo application and, in turn, brought these lessons back to their home institutions across the globe. Ken's impact, without hyperbole, has been global.

Beyond his orthotics expertise, Ken has been a vital part of the social fabric of the spine program. Ken's exceptionally welcoming and friendly nature has been central to countless Spine Program social events over the years. His annual Cascade Christmas Party was considered a holiday staple social gathering for the Calgary spine surgeons.

As Ken begins the next life chapter in retirement, the members of the Calgary Spine Program wish him every ounce of relaxation and enjoyment that this stage will bring and trust that he understands the immense role he has played in shaping our Program over the last thirty years and the enduring legacy that he built as a valued member of our group.

Happy Retirement!!
Dr. Bradley Jacobs



SOCIAL EVENTS

We had plenty to celebrate this academic year. The ASF Holiday Party took place at Fortuna's Row on December 3, 2023. On June 21, 2024, we toasted the graduation of our spine fellows at Bridgette Bar. Congratulations to Dr. Abdullah AlDuwaisan, Dr. Michael Craig, Dr. Amit Parekh and Dr. Remi Pelletier-Roy.



