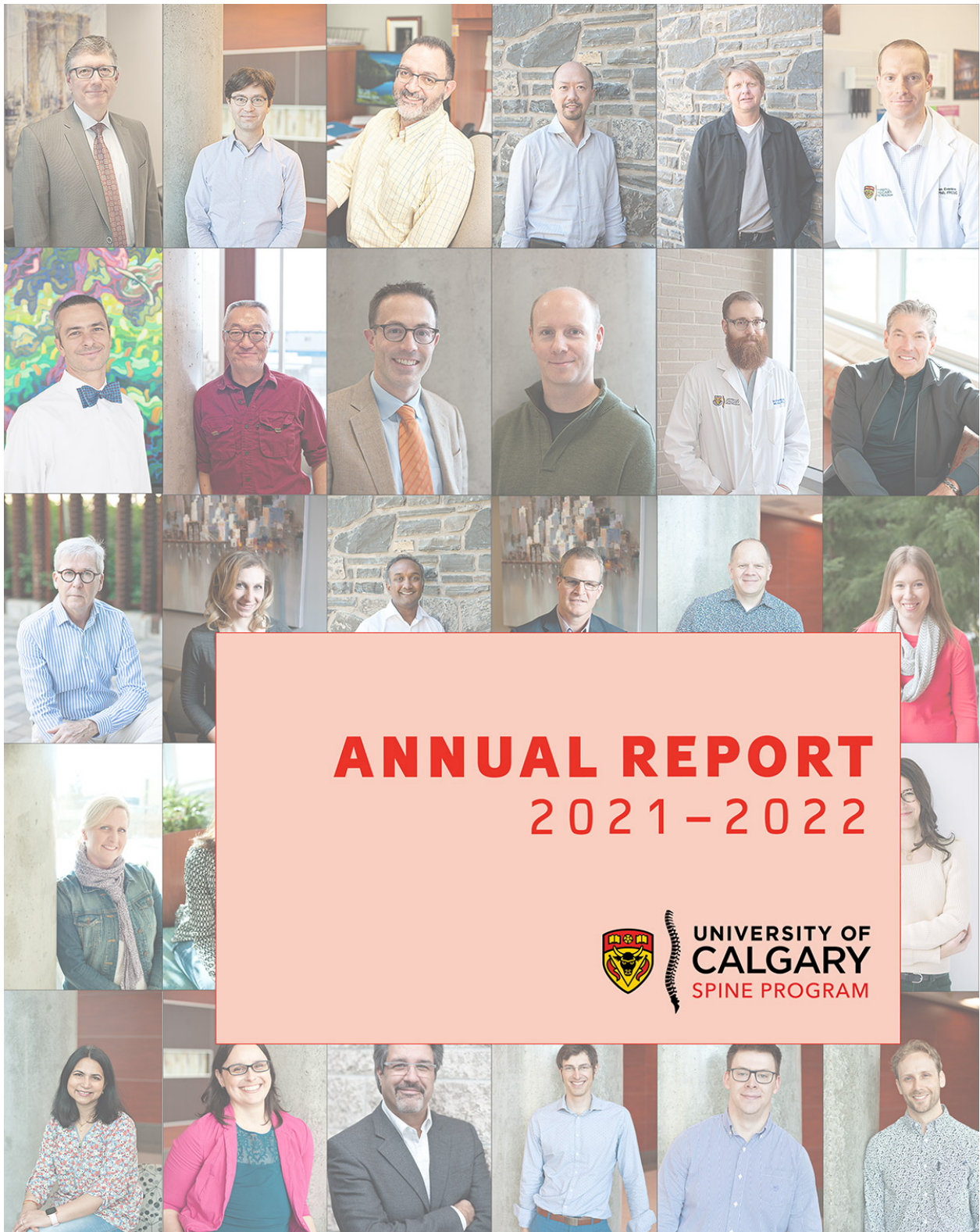


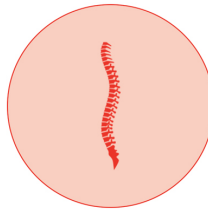


ANNUAL REPORT

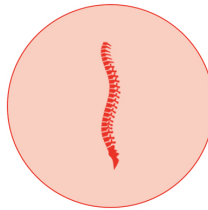
2021-2022



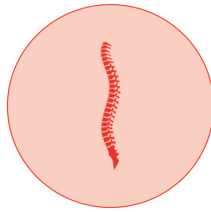
UNIVERSITY OF
CALGARY
SPINE PROGRAM



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INTRODUCTION

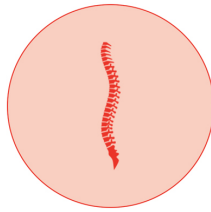
Dr. Bradley Jacobs
Program Chair



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.



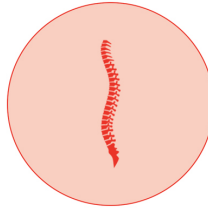
Active collaborations exist with physiatry and psychiatry. Our program has been able to achieve excellence across the spectrum of clinical care delivery, surgical education and research primarily because of the collaborative and collegial work environment that is well established within our combined 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 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 2021-22 academic year. Please enjoy!

Dr. W. Bradley Jacobs,
Program Chair



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 Lewkonia
- Dr. Fred Nicholls, Fellowship Director
- Dr. David Parsons
- Dr. Paul Salo
- Dr. Alex Soroceanu
- Dr. Ganesh Swamy
- Dr. Ken Thomas, Research Director

• Allied Health

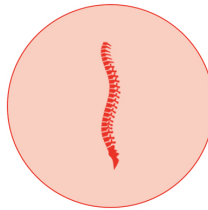
- Brooke Nowicki, Manager Clinical Neurosciences, Spine Program Operations Manager
- Ken Moghadam, Certified Orthotist (CO) Cascade Orthotics
- Rob Cameron, CO Cascade Orthotics
- Drew Anholt, CO Cascade Orthotics
- Jeff Wright, CO Cascade Orthotics

• Nursing Staff

- Chris Marsh, OR nurse clinician

• Nurse Practitioners

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



• Research Staff

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

• Spine Fellows

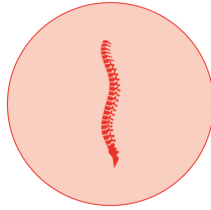
- Dr. Osama Aldahamsheh
- Dr. Lukas Burger
- Dr. Richard Cowley
- Dr. Matthew Coyle
- Dr. Marina Rosa Filezio (ACH)
- Dr. Vishwajeet Singh (ACH)

• Neurosurgery Residents 2021–2022

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

• Orthopaedic Residents 2021–2022

- | | |
|-----------------------------|-----------------------------|
| ○ Jennifer Purnell (R5) | ○ Christopher Hewison (R3) |
| ○ Michael James (R5) | ○ Erin Davison (R3) |
| ○ Brent Benavides (R4) | ○ Jarrett Moore (R2) |
| ○ Daniel You (R4) | ○ Julian Rizoz (R2) |
| ○ Jayd Lukenchuk (R4) | ○ Laura Collings (R2) |
| ○ Murray Wong (R4) | ○ Logan Woods (R2) |
| ○ Taryn Ludwig (R4) | ○ Anna-Lee Policicchio (R1) |
| ○ Laura Morrison (Research) | ○ Brodie Ritchie (R1) |
| ○ Annalise Abbott (R3) | ○ Ethan Sanders (R1) |
| ○ Bryan Heard (R3) | ○ Gareth Ryan (R1) |
| ○ Christopher Flanagan (R3) | ○ Manjot Birk (R1) |



CLINICAL ACTIVITY

Surgical Sites

Foothills Medical Centre

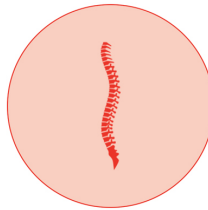
The Foothills Medical Centre is a level 1 trauma center serving more than two million people from the City of Calgary and the surrounding regions of southern Alberta, southeastern British Columbia and southern Saskatchewan. Approximately 1500 spinal procedures are performed per year at Foothills Medical 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 2021/2022 the paediatric spine team performed 78 spine surgeries.

Canadian Surgery Solutions

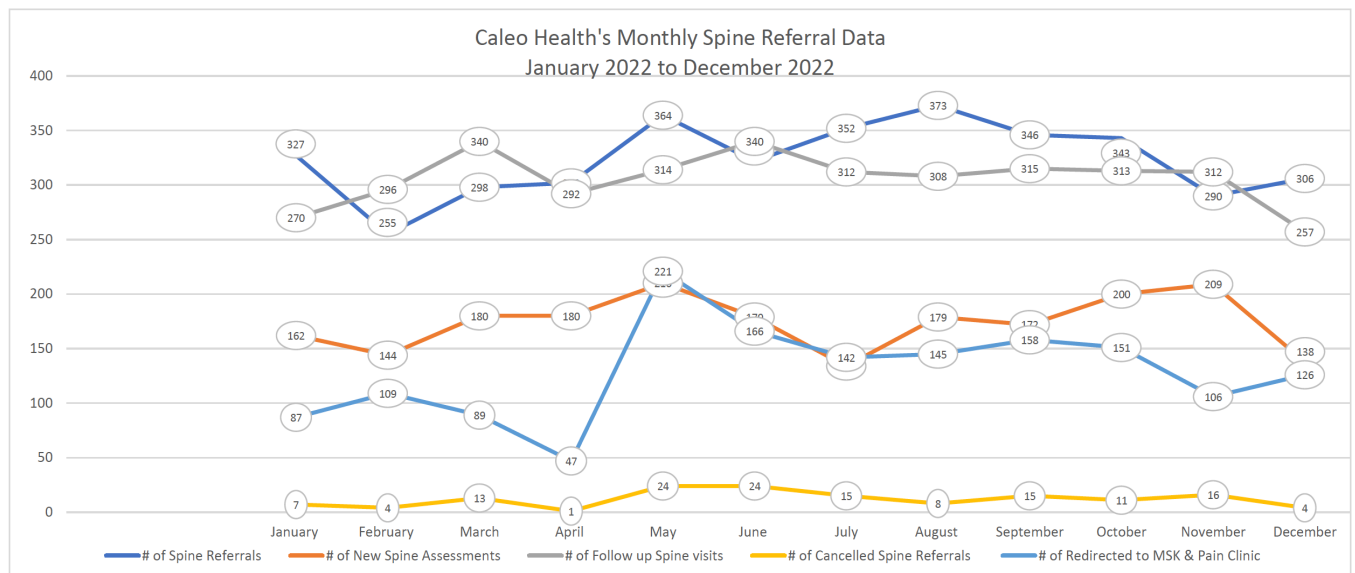
Canadian Surgical Solutions (CSS) is a non-hospital surgical facility equipped to perform a comprehensive range of orthopaedic surgical procedures, including total joint replacements and spinal procedures. Dr. Fred Nicholls, Dr. Roger Cho and Dr. Paul Salo perform spine cases at CSS for the Workers Compensation Board.

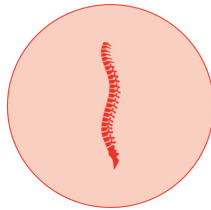


Consultation Services

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, Dr. Fleck & Dr. Magown.
- Caleo received approximately 3900 referrals in 2022 (down 2% from 2021).
- The average wait time for spine assessment was approximately 2-3 months in 2022, unchanged from 2021.
- In 2022, patients were provided their spine assessment appointment date within 5 -10 business days of completing the spine registration.
- In 2022, referring physicians/healthcare providers received a "Referral Received/Accepted Confirmation" within 2-4 weeks from the time the referral was received at Caleo Health.

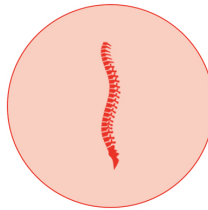




- Approximately 45-50% of the patients assessed in 2022 require further referral to a spine surgeon, a similar referral pattern to 2021. The other 50-55% received a referral for physical rehabilitation, pain management and/or conservative treatments.
- All spine patients are provided the option to follow up with the triage physician PRN, until discharged from the spine clinic.
- In 2022, wait time from spine assessment to surgical consult was approximately 12-16 months. Surgical consultation wait-times were down 20% compared to 2021.

Dr. Mark Lewis
Clinical Director, Caleo Health



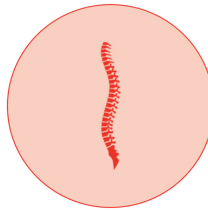


Spine Triage and Assessment Clinic (STAC)

The Spine Triage and Assessment Clinic (STAC) has now been operational for 18 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. From 1-Jul-2021 to 30-Jun-2022, the clinic received 2803 referrals from the community and other specialists.



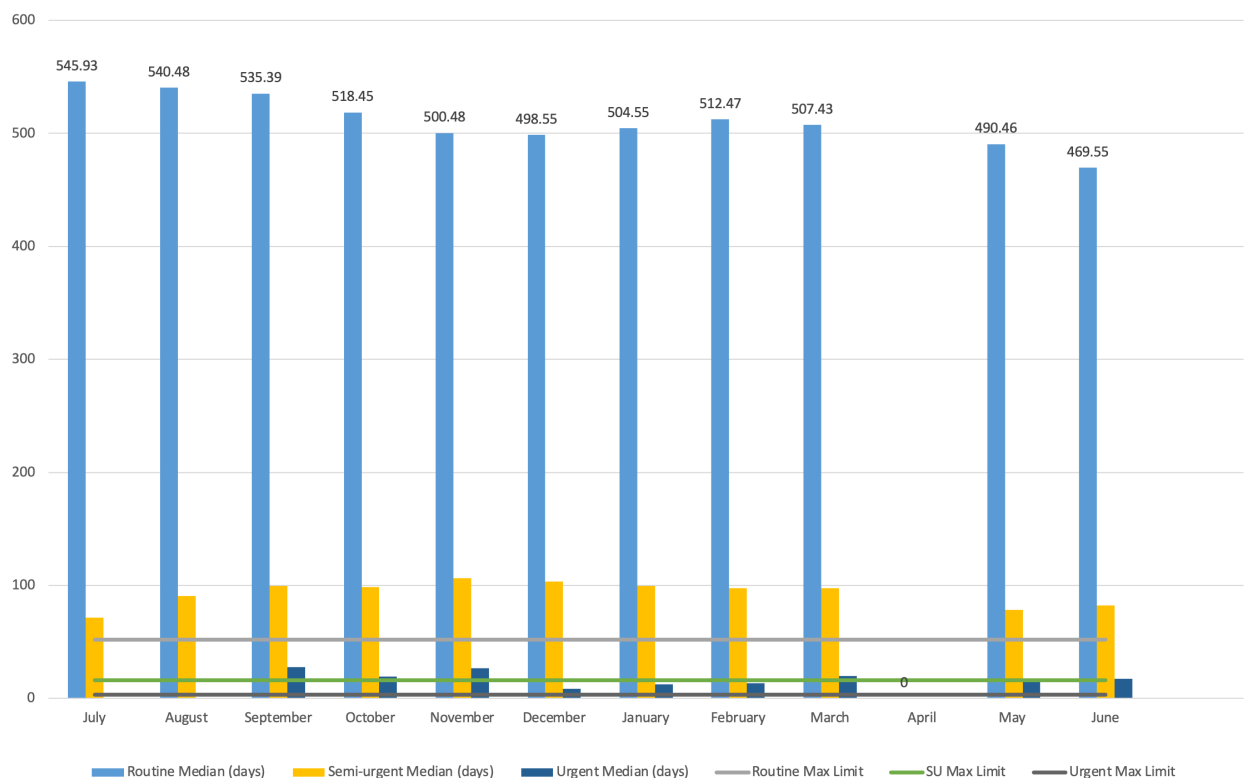


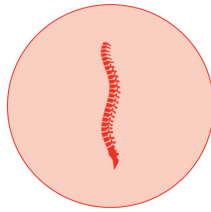
Educational initiatives about the indications for referral and diagnostic imaging requirements have been developed with community partners, and they attend onsite visits to STAC. In addition, residents in Physiatry are being exposed to STAC with plans to involve Family medicine and Emergency medicine 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.

STAC's success is undoubtedly due to Randi and Katie's motivated administrative efforts and dedication of the spine triage physicians, as well as 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

STAC Wait Times
July 2021 - June 2022



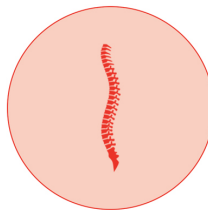


University of Calgary Outpatient Clinics

Several outpatient clinics take place at the University of Calgary including consultation and follow-up. It is also the site of basic science research, clinical research and many education activities provided by members of the spine program.

Urgent Consultations and Surgery

Patients presenting with neurologic deficits, fractures, dislocations and tumors are assessed and treated by a spine staff surgeon on call. Ten 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.

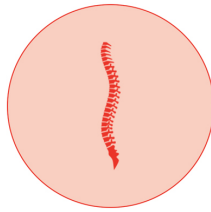


Surgical Activity

Alberta Health Services (FMC)

Surgeries by procedure code from 1-Jul-2021 to 30-Jun-2022 listed for the following surgeons: Aziz, Bouchard, Cadotte, Casha, Cho, du Plessis, Evaniew, Jacobs, Lewkonja, Nicholls, Salo, Soroceanu, Swamy and Thomas.

Procedure Group	2021/2022
Cerv Ant Decompression	3
Cerv Ant Arthroplasty	14
Cerv Ant Arthroplasty/Fusion	1
Cerv Ant Fusion/ACDF	182
Cerv Postr Fusion/Inst	106
Cerv Postr Decompression	28
Cerv Postr Decompression MIS	13
Cerv Postr Fusion/Laminoplasty	5
Cervical 2 Stage	18
Tho/Lum 2 Stage	65
Tho/Lum Ant Arthroplasty	8
Tho/Lum Ant Arthroplasty w/Fusion	8
Tho/Lum Ant Fusion	18
Tho/Lum Postr Decompression	399
Tho/Lum Postr Decompression MIS	239
Tho/Lum Postr Fusion MIS	57
Tho/Lum Postr Fusion/Inst	245
Tho/Lum 3 Stage	12
Tho/Lum Fusion DLIF short segment	4
Tho/Lum Fusion OLIF short segment	1
Tho/Lum Post Kyphoplasty	0
Tho/Lum Postr Fusion Combined Open/MIS	4
Misc Spine (includes spine tumor, neuro spine shunt, cranial halo application, spine cord tumor/excision lipoma, spine lum pos detether fatty filum terminale, spine lum pos pseudo meningo/cystocele repair, spine pos laminoplasty with rhizotomy 1-2 levels & spine pos laminoplasty with rhizotomy 3+ levels)	105
Totals	1535



Canadian Surgery Solutions

Between 1-Jul-2021 and 30-Jun-2022, three of our spine surgeons, Dr. Cho, Dr. Nicholls and Dr. Salo, completed a total of 73 lumbar cases at Canadian Surgery Solutions.

Inpatient Spine Care

Unit 101 – Foothills Medical Centre

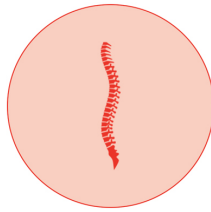
The 2021-2022 year saw a slow shift out of the pandemic operations, into a recovery period. With the post-pandemic surgical recovery, the demand for spine beds was higher than ever. Unit 101 also experienced nursing shortages, similar to what was seen nationally, and internationally. Summer 2022 saw some of our most severe shortages, and it was quite challenging for the morale of the team. However, the unit staff pulled together and used their established culture of teamwork and excellent to continue to provide best practice care for the spine patient population.

We had two significant operational leadership changes this year. Karolina Herold left our team for an opportunity at the Rockyview General Hospital, and Lyndee Kehler came on as her replacement. Lyndee has a vast experience within private sector leadership-her expertise in clinical operations was a valuable asset gained. Julie Reader, the Clinical Nurse Educator, rejoined the team after the end of her temporary position with the Neuroscience Strategic Clinical Network.

The operational work for this year was focused on preparing for the launch of Connect Care in November 2022, and establishing the framework for the Enhanced Recovery After Surgery (ERAS) for the lumbar spine patient population.

As the healthcare system stabilizes, we hope that the worst of the pandemic is passed. Unit 101 continues to provide excellent, highly specialized care, and will endeavor to do so long past the time where the threat of COVID-19 has waned. Thank you, 101!

**Julie Reader
Brooke Nowicki**



Adult Spinal Deformity

With the resumption of normal operating schedules after the COVID pandemic, the spinal deformity section's activities continued. For the 5th year, we continued multi-disciplinary rounds with spine surgeons, anesthesiologists, and pain management specialists.

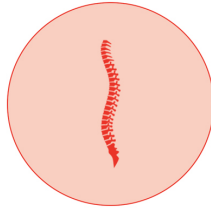
On the first Thursday of the month, we met to discuss pre-operative patients, and review suitability for surgery. We have noticed a frequent change in plans after the meeting and are planning a prospective study to measure how frequently this happens. Overall, we discussed 74 pre-op patients and 66 post-op 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 was created in 2022! After several years of asking, Drs. Rogan, Josh Wilson, Danae Krahn, Shean Stacey and Chris Dyte have joined forces to create this group. Shean has announced a retirement date, but we will extract as much work as possible prior to then. Having consistent anesthesiologists allows for investigations into outcomes and fluid management protocols, which we hope to compile this year.

The TOPPS program put through 62 patients last year, ensuring that no complex patients start 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 and suggest significant importance of such pain teaching to surgical outcomes. Look out for more research from this exciting dataset.

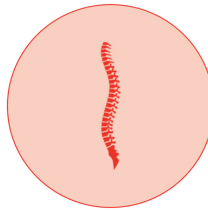
There are several deformity-based research projects ongoing. These include:

- Registry studies
 - ISSG (Soroceanu)
 - CSORN Deformity (Led by Dr. Soroceanu). We are enrolling most patients into this database.



- Pain Management and Pre-Operative Pain Teaching (Eckenswiler, Soumbasis, Evaniew, Soroceanu)
 - 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)
- Creation of a Patient Decision Aide (PtDA) to decrease decisional regret (Swamy PI, Valerie Cates M.Sc. student)

Dr. Ganesh Swamy



Rehabilitation:

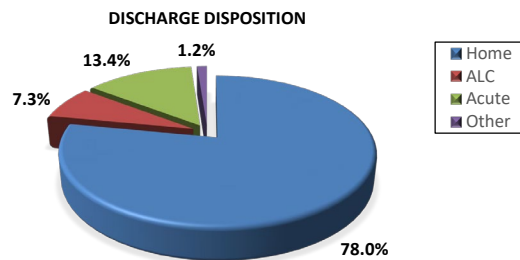
Calgary Spinal Cord Injury Program Data

(July 2021 - June 2022)

BASIC DEMOGRAPHICS	Traumatic	Non-Traumatic	Total
Total # of patients discharged	40	42	82
	49%	51%	

ADDITIONAL DEMOGRAPHICS	Traumatic	Non-Traumatic	Total
Average age (years)	46.8	57.9	52.5
Males	88%	69%	78%
Females	13%	31%	22%

AVERAGE LENGTH OF STAY (LOS) (in # of days)		Traumatic	Non-Traumatic	Total
Acute LOS (Onset Days)		30.6	30.4	30.5
Tertiary Neuro	Active LOS	49.4	49.8	49.6
Rehab Unit	Total LOS	54.7	57.0	56.0
Total In-patient LOS		85.3	87.5	86.5



Additional Notes re: Discharge Disposition

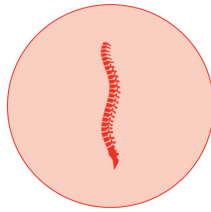
Home → Includes with and without additional health care services (i.e., home care)

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	74.3	77.5	75.9
Average Discharge FIM Score	97.4	99.1	98.3
Change in FIM Score	31.1%	27.5%	29.2%

Provided by Magda Mounieimne MScOT
Quality Lead, FMC Tertiary Neurorehabilitation Program



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.

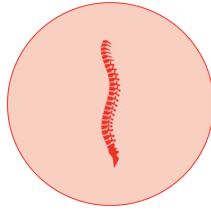
Postgraduate Resident

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. We did not have any postgraduate students this academic year.

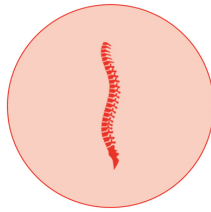


Rounds

Weekly Spine Rounds are typically held Wednesdays from 7-8 AM and in 2022, we transitioned back to in-person format. 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.





Dr. Fred Nicholls

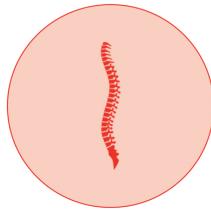
Fellowship Director



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 curriculum, 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.

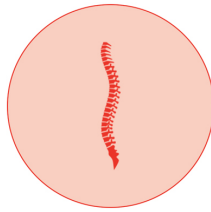
The Spine Fellowship year runs from July 1 to June 30 of the following year. Time is equally divided between four combined Orthopaedic and Neurosurgical services. Combined teaching conferences occur twice weekly with curriculum-based discussion and presentation of both recent and complex cases. Monthly mortality and morbidity rounds occur with the full attendance of Orthopaedic and Neurosurgical house staff and Spine Program attending staff. 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
2021-2022**

Dr. Osama Aldahamsheh
Dr. Lukas Burger
Dr. Richard Cowley
Dr. Matthew Coyle





Fellowship Testimonial

My name is Richard Joseph Cowley, I'm not Australian and I'm a proud Calgary Spine Fellow. The Calgary Spine Fellowship was the axis for a brilliant time for my family and I. What brought us there was a desire to work for and within a fantastic spine program. What we took away was so much more.

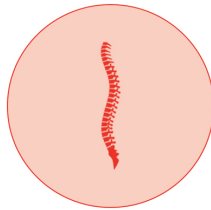
"It's the decision, not the incision that will be the most difficult and the most important."

Having now practiced for 6 months in New Zealand, there are many Canadian accents which I hear on a daily frequency. These mentor voices have an array of Alberrrrta twang, cowboy volume, passionate tone, enthused speed and passive aggression. They all speak with truth and come from experience. The decisions are now mine but I'm grateful for the voices guiding me towards sound clinical decision making and better choices in life.



"If you get a referral from a colleague, it's unlikely to be low lying fruit."

The Spine Surgeons of Calgary treat their fellows as colleagues. I felt empowered to lead, prepare and develop independence through appropriate autonomy and supervision. Working closely with an array of personalities and approaches I was able to save many quotes in a file labeled 'Spine Wisdom'. I was reminded of the above quote on my first referral in New Zealand being a Charcot spine! The high volume of 'work' (I loved it all) within an incredibly supportive and encouraging environment has provided a base of clinical experience to begin my career. Outside of this 'work' the well lubricated Journal Clubs, openly honest fellow rounds, shark tank resident rounds and supportive research environment shakes the pillars of your understanding until you eventually realize that consensus is a delusion, and you have to make a decision and get on with it! The fellowship continues to attract quality applicants, a testament to the vision and hard work of the leadership.



He aha te mea nui o te ao

What is the most important thing in the world?

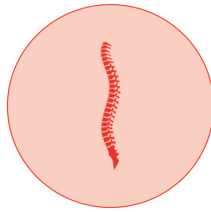
He tangata, he tangata, he tangata

It is the people, it is the people, it is the people

As a family we were warmly welcome by the Spine Community and the people of Calgary. Our children became so comfortable with their local group of friends they would run naked from house to house on 35th St NW! We created friendships with the families of my co-fellows and enjoyed everything the fellowship has to offer together. We look forward to nurturing all of these bonds on many returns to Western editions of Canadian Spine Society and would love to repay the hospitality if anyone was to venture to the South Pacific.

Love Always,
Rich





RESEARCH

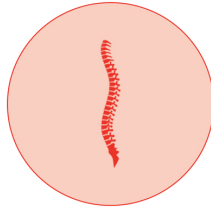
Dr. Ken Thomas
Research Director



Research Summary

The University of Calgary Spine Program had a very successful research year. Our faculty were principal investigators or collaborators on 13 externally funded research grants (worth over \$1 million). Faculty members authored 33 peer-reviewed publications. In addition, 10 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 CSORN sub-studies related to cervical spondylotic

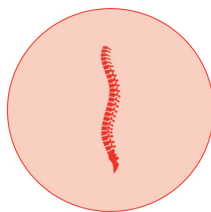


myelopathy, the surgical treatment of degenerative spondylolisthesis, isthmic spondylolisthesis and adult spinal deformity.

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.

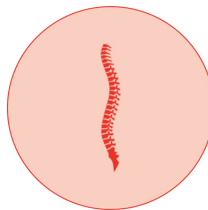
Finally, it is very important to note that all the recent research successes of the Calgary Spine Faculty are a direct result of our 4 excellent, efficient, and highly organized research associates: Tara Whittaker, Ish Bains, Saswati Tripathy and Victoria Smith.



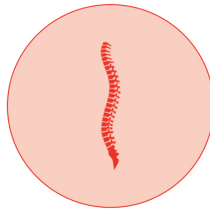


2021-2022 RESEARCH PROJECTS

Prospective RCTs enrolling	PI	Status
Minocycline (MASC)	Casha	Enrolling/data collection
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	Under Review
Epidural Stimulation in Cervical SCI (HEMO STIM)	Casha/Girgis/Phillips	Enrolling/data collection
Cerapedics: i-FACTOR Study	Jacobs	Enrolling/data collection
Prehab for Patients with Lumbar Spinal Stenosis	Thomas/Gross	Enrolling/data collection
Prospective Randomized Clinical Trials in follow-up		
INSTRuCT-SCI Study	Casha	In follow-up
Clinical Studies - Observational		
Cervical Myelopathy (CSORN)	Cadotte	Enrolling/data collection
Degenerative Spondy Cohort Study (CSORN)	Fisher/Casha/Thomas	Enrolling/data collection
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	Analysis
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	Enrolling/data collection
Effects of obesity on outcomes after degen lumb spine surg	Evaniew	Analysis
AOSpine Acute SCI Guidelines update	Evaniew/Kwon/Fehlings/Tetreault	Enrolling/data collection
Effects of specialized hospital care on 1 yr mortality among patients with acute SCI	Evaniew/Kwon/Dvorak/Praxis	Manuscript Prep
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



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		
Early neurological deterioration after surgery for CSM: an observational study CSORN	Burger/Evaniew/Jacobs	Enrolling/data collection
Timing of recovery after surgery for cervical spondylotic myelopathy	Coyle/Evaniew	Manuscript Prep
Analysis of the Implications of lumbopelvic alignment on the alignment of the cervical spine	Coyle/Nicholls/Swamy	Analysis
New Global Spinal Balance Classification in Patients with ASD: Validity & Clinical Applicability Study	Aldahamsheh/Nicholls	Ethics
Unexpected + Culture in Presumed Aseptic Revision Spine Surg: Systematic Review & Meta-Analysis.	Aldahamsheh/Burger/Evaniew/Nicholls	Manuscript Prep
Clinical & Rad Outcomes of Adj Segment Disease Treatment after ACDF: Systematic Review & Meta-Analysis	Aldahamsheh	Manuscript Prep
How does the Ames Cervical Deformity class. Apply to the normal pop?	Cowley/Nicholls	Manuscript Prep
Multicenter retrospective review of sub axial cervical spine fracture dislocation surgery	Cowley/Casha/Evaniew	Enrolling/data collection
Evaluation of the Ability of Lateral Interbody Cages to Correct Adult Spinal Deformities	Singh/Swamy	Edits
Robotic Assessment of Cervical Myelopathy	Kassam/Cadotte/Dukelow	Ethics
Ageism: is age an independent predictor of outcome after lumbar spine surgery	Bond/Aldebeyan/Nares/Thomas	Under Review
Is the incidence of PJF & PJK declining over time? A 10 yr study of the Calgary Deformity Database	Singh/Swamy	Enrolling/data collection
Pull-out force of 8 different pedicle screw designs in 3 porcine bone densities	Oppermann/Swamy	Enrolling/data collection

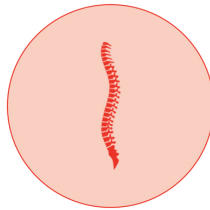


Published Manuscripts *1-Jul-2021 to 30-Jun-2022*

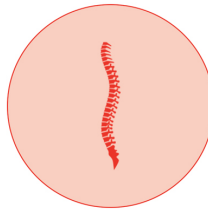
*Peer-Reviewed Publications (Bold denotes Calgary Spine Program Faculty,
* denotes Calgary Spine Fellow):*

2022

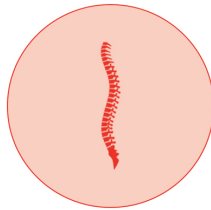
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2. Banaszek D, McIntosh G, Charest-Morin R, Abraham E, Manson N, Johnson MG, Bailey CS, Rampersaud YR, Glennie RA, Paquet J, Nataraj A, Weber MH, Christie S, Attabib N, **Soroceanu A**, Kelly A, Hall H, **Thomas K**, Fisher C, Dea N. Practice Variation between Salaried and Fee-for-Service Surgeons for Lumbar Surgery. Can J Neurol Sci. Jun 16, 2022;1-8. DOI: [10.1017/cjn.2022.259](https://doi.org/10.1017/cjn.2022.259). Online ahead of print.
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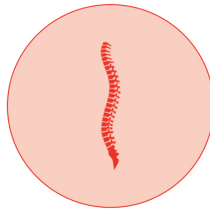
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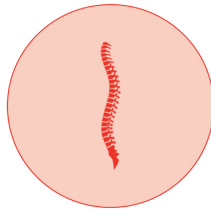


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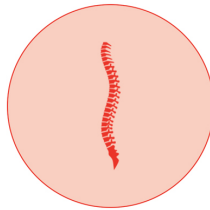


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7. Iorio-Morin C, Fisher CG, Abraham E, Nataraj A, Attabib N, Paquet J, Hogan TG, Bailey CS, Ahn H, Johnson M, Richardson EA, Manson N, **Thomas K**, Rampersaud YR, Hall H, Dea N. Low-back pain after lumbar discectomy for disc herniation: what can you tell your patient? *J Neurosurg Spine*. Aug 27, 2021;35(6):715-721. DOI: [10.3171/2021.2.SPINE201625](https://doi.org/10.3171/2021.2.SPINE201625)
8. Jentzsch T, **Cadotte DW**, Wilson JR, Jiang F, Badhiwala JH, Akbar MA, Rocos B, Grossman RG, Aarabi B, Harrop JS, Fehlings MG. Spinal Cord Signal Change on Magnetic Resonance Imaging May Predict Worse Clinical In- and Outpatient Outcomes in Patients with Spinal Cord Injury: A Prospective Multicenter Study in 459 Patients. *J Clin Med*. 2021 Oct 18;10(20):4778. doi: [10.3390/jcm10204778](https://doi.org/10.3390/jcm10204778)
9. Karim SM, **Cadotte DW**, Wilson JR, Kwon BK, **Jacobs WB**, Johnson MG, Paquet J, Bailey CS, Christie SD, Nataraj A, Attabib N, Phan P, McIntosh G, Hall H, Rampersaud YR, Manson N, **Thomas KC**, Fisher CG, Dea N: Effectiveness of Surgical Decompression in Patients with Degenerative Cervical Myelopathy: Results of the Canadian Prospective Multicenter Study. *Neurosurgery*. Oct 13, 2021;89(5):844-851. DOI: [10.1093/neuros/nyab295](https://doi.org/10.1093/neuros/nyab295)
10. Kendal J, **Evaniew N**, Swamy G. Uremic Tumoral Calcinosis of the Cervical Spine. *CMAJ*. 2020 Sep 28;192(39):E1133. DOI: [10.1503/cmaj.200104](https://doi.org/10.1503/cmaj.200104)
11. Singh S, Ailon T, McIntosh G, Dea N, Paquet J, Abraham E, Bailey CS, Weber MH, Johnson MG, Nataraj A, Glennie RA, Attabib N, Kelly A, Hall H, Rampersaud YR, Manson N, Phan P, **Thomas K**, Fisher CG, Charest-Morin R. Time to return to work after elective lumbar spine surgery. *J Neurosurg Spine*. Sep 24, 2021;1-9. DOI: [10.3171/2021.2.SPINE202051](https://doi.org/10.3171/2021.2.SPINE202051). Epub ahead of print.



Published Book Chapters

1-Jul-2021 to 30-Jun-2022

*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. Ludwig T, Ben-Israel D, **Nicholls F**: Chapter 16: Spine. Oxford Handbook of Sport and Exercise Medicine, Third Edition

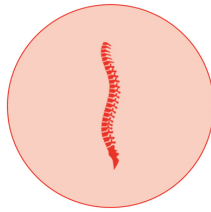
Presentations

1-Jul-2021 to 30-Jun-2022

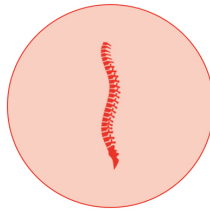
*(Bold denotes Calgary Spine Program Faculty, * denotes Calgary Spine Fellow)*

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. Presented by: Osama Aldahamsheh (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. Presented by: Osama Aldahamsheh (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. Heard B, **Salo P**, Krawetz R, Hart D, Bains I, **Swamy R**. Expression of Blood Serum Cytokines in the Presentation of Acute Sciatica. (Poster), Canadian Spine Society Annual Meeting - Virtual, April 2022.

2021

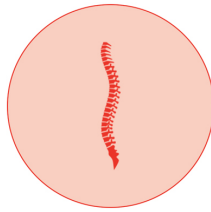
1. **Evaniew N, Swamy G, Jacobs WB, Bouchard J, Cho R**, Manson N, Rampersaud R, Paquet J, Bailey C, Johnson M, Attabib N, Fisher C, McIntosh G, **Thomas K**. Lumbar fusion surgery for patients with back pain and degenerative disc disease: observational study from the Canadian Spine Outcomes and Research. Global Spine Congress AOSpine Annual Meeting (Virtual/Hybrid), Paris, France, November 3, 2021.
2. Karmur BS, Cunningham J, **Lewkonja P, Casha S, Yang M**. Postoperative urinary retention after elective spine surgery: systematic review and meta-analysis. 37th Annual Meeting of the Section on Disorders of Spine & Peripheral Nerves, San Diego, USA, Jul 28-31, 2021.
3. Karmur BS, Cunningham J, **Lewkonja P, Casha S, Yang M**. Postoperative urinary retention after elective spine surgery: systematic review and meta-analysis. Enhanced Recovery After Surgery (ERAS) USA Meeting, New Orleans, USA, Nov 10-12, 2021.

Grants

1-Jul-2021 to 30-Jun-2022

Active Research Grants (Bold denotes Spine Program Faculty)

Cadotte D. Alberta Spine Foundation, Calgary Chapter: Delivering Precision Medicine to Patients with Degenerative Cervical Myelopathy. Principal Investigator. 2021. Amount \$25,000.00.



Cadotte D. Alberta Graduate Excellence Scholarships (AGES) - Master's Research, Tri-Council Canada Scholarship (NSERC, SSHRC, CIHR) Scholarship. Administered by the Faculty of Graduate Studies, University of Calgary. Student: K. Ost. 2021.

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. Rick Hansen Spinal Cord Injury Registry Project. Principal Investigator. 2017-2020. Amount \$60-72,000/yr renewable

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

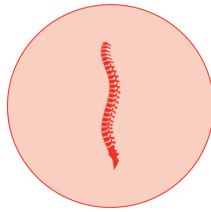
- Fraternal Order of Eagles Spine Grant \$20,000.00
- McCaig Catalyst Grant \$30,000.00
- Division of Orthopaedic Surgery \$30,000.00
- Total Funding: \$80,000.00

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

- Alberta Spine Foundation Grant \$20,000.00
- COREF Grant \$9,875.00
- Total Funding: \$29,875.00

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 \$235,000.

- Fraternal Order of Eagles Grant (\$20 000) [2021]
- Pathways to Success, Dept of Surgery, U of Calgary (\$150 000) [2021]
- AO Discovery Grant (45 000 CHF) [2022]
- McCaig Institute Clinician-Scientist Grant (\$20 000) [2022]



Swamy G. M6 vs Prodisc-C Kinematics

- Alberta Spine Foundation (\$20 000) [2021]

Swamy G & Salo P. Can Systemic Inflammatory Profiles predict natural history of lumbar disc herniations?

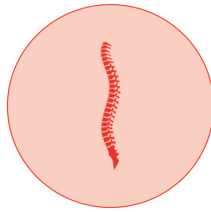
- Alberta Spine Foundation (\$20 000) [2021]

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)

Bouchard J. Faculty advisor University of Calgary (2001 to 2021)

Bouchard J. Medical student Appeals Committee (2009 to present)

Bouchard J. Postgraduate Medical Education Committee (2019 to 2021)

Bouchard J. Surgical Foundations Competence Committee (2018 to 2021)

Bouchard J. Orthopaedic Surgery Competence Committee (2018 to 2021)

Bouchard J. Competency by Design Lead, Section Orthopaedic Surgery, Department of Surgery, 2017 to 2021.

Bouchard J. Orthopaedic Surgery Residency Training Committee (2018 to 2021)

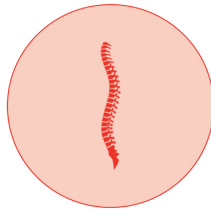
Bouchard J. Surgical Foundations Faculty Advisor (2018 to present)

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. 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)

Salo P. Site Chief, Section of Orthopaedics, Foothills Medical Centre (2011 to present)

Salo P. Chair, McCaig Institute Research Committee (2018 to present)

Salo P. Faculty Research Director, Section of Orthopaedics (2014 to 2022)

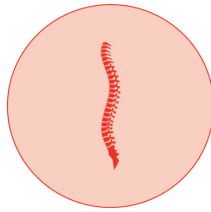
Salo P. Co-Chair Research Portfolio, Section of Orthopaedics, Foothills Medical Centre

Salo P. Member, Operations Committee, Section of Orthopaedics, Foothills Medical Centre

Salo P. Member, Clinical Investigator Program Residency Training Committee (2015 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. 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. Clinical Systems Design Clinical Lead, Connect Care (Orthopaedics), Alberta Health Services (2018 to 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)

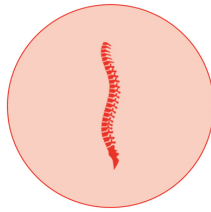
Thomas K. Tri-lead of the Bone and Joint Health Strategic Clinical Network – MSK Transformation-Spine Health Work Group (2019 to present)

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. 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 Secretary/Treasurer (2020 to 2022)

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

Bouchard J. Member, Research Committee, SAS (Society for the Advancement of Spine, Spine Arthroplasty Society).

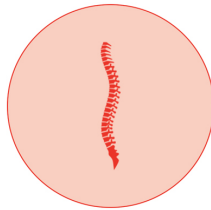
Bouchard J. Member, International Competency Based Medical Education study group.

Bouchard J. Continuing Medical Development Committee, North American Spine Society.

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

Casha S. AANS and CNS joint guidelines committee member (2011 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. Chair, AOSpine Global Diploma Training Program Cervical Degeneration Learning Module (2021)

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

Jacobs WB. Chair, AOSpine Global Diploma Training Program Cervical Degeneration Learning Module, (2021)

Jacobs WB. Member, AOSpine Global Diploma Training Program Committee, (2018 – present)

Jacobs WB. Member, Research & Awards Committee, AANS/CNS Section of Disorders of the Spine and Peripheral Nerves (2018 to 2021)

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

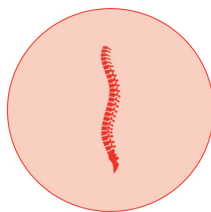
Jacobs WB. Member, Executive Committee, AANS/CNS Section of Disorders of the Spine and Peripheral Nerves (2015 to 2021)

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

ACH Research Highlight

Radiographic reporting in adolescent idiopathic scoliosis: is there a discrepancy comparing radiologists' reports and surgeons' assessments?

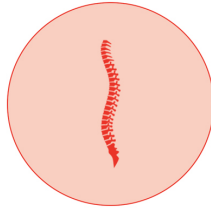
Miss Karamjot Sidhu, Dr Marina Filezio, Dr Vishwajeet Singh, Dr Fabio Ferri-de-Barros
University of Calgary, Calgary, Alberta, Canada

Objectives

Cobb angle measurement is the standard method for quantification of scoliosis in adolescent idiopathic scoliosis (AIS), which guides decision-making for treatment. Primary care physicians rely on radiology reports to follow guidelines provided by specialists to facilitate priority setting of referrals. Accurate clinical and radiographic assessments are key to ensure timely tertiary care referrals for patients who are eligible for bracing, which is a time sensitive evidence-based intervention. This study investigated the agreement of Cobb angle measurements between radiologists and treating spine surgeons.

Method

We performed a retrospective audit of 40 randomly selected spinal radiographs of patients with AIS. Cobb angle, Risser stage, and "end vertebrae" were recorded from the radiographic reports. Two spine surgeons (blinded to the reports) provided the same measurements on the same set of radiographs, prospectively. We compared measurements by radiologists and spine surgeons. To assess inter-rater reliability, interclass correlation coefficients (ICC) with 95% confidence intervals (95%CI) were computed. ICC <0.70, 0.70-0.79, 0.80-89, and 0.90-0.99 were considered poor, fair, good, and excellent reliability, respectively.



Results

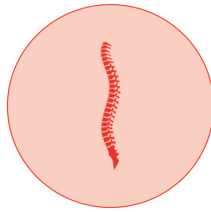
The agreement of Cobb angle between spine surgeons was excellent (ICC 0.96, 95%CI 0.93-0.98). The agreement of Cobb angle between spine surgeons and radiologists was good (ICC 0.83, 95%CI 0.13-0.97). The agreement of Cobb angle between spine surgeons and community radiologists and paediatric radiologists was good (ICC 0.88, 95%CI -0.13-0.97) and excellent (ICC 0.90, 95%CI 0.55-0.97), respectively. However, 15 out of 37 radiographs performed at community level did not meet the standard requisite criteria.

Risser stage was not reported in 21 of the 37 radiology reports. Agreement between spine surgeons and radiologists for Risser stage was poor (ICC 0.42, 95%CI -0.59-0.79). There was a 25% agreement between radiologists and spine surgeons for end vertebrae identification. Overall, every 1 in 4 referral was inappropriate as a result of these discrepancies.

Conclusions

This study demonstrated a significant disagreement in scoliosis measurements between radiologists and spine surgeons. This may have a negative impact on timely and appropriate referrals to tertiary care for AIS.





PEDIATRIC SPINE FELLOWS 2021-2022

Dr. Marina Rosa Filezio
Dr. Vishwajeet Singh



Manuscripts in progress 1-Jul-2021 to 30-Jun-2022

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

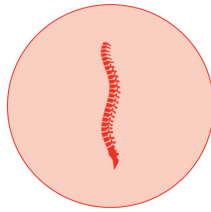
*Filezio MR, Peiro-Garcia A, **Parsons DL, Thomas K, Ferri-de-Barros F**. Accuracy of radiographic and computed tomography grading in comparison to open laminectomy to evaluate thoracic pedicle screws positioning in simulation models of adolescent idiopathic scoliosis.



Sidhu K, *Filezio M, Abouassaly M, & **Ferri-de-Barros F**. Arthrodiastasis for the treatment of avascular necrosis in pediatric patient following a traumatic femoral neck fracture.

Sidhu K, *Filezio M, *Singh V, Birk M, & **Ferri-de-Barros F**. Examining the reliability of Cobb angle measurements in adolescent idiopathic scoliosis.

*Singh V, *Filezio M, **Parsons D, & Ferri-de-Barros F**. Pedicle screw malposition rate and 'time-to-instrument' for pedicle screw instrumentation techniques in an on-site simulation experiment model.



ACH Presentations

1-Jul-2021 to 30-Jun-2022

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

2022

*Filezio M. The use of multimedia resources to assist guardian understanding of surgical consent prior to spinal surgery in pediatric patients - a quasi-experimental study. Fellows Research Symposium, May 2022.

*Filezio M. The use of multimedia resources to assist guardian understanding of surgical consent prior to spinal surgery in pediatric patients - a quasi-experimental study. 40th Annual Surgeons' Research Day, June 2022.

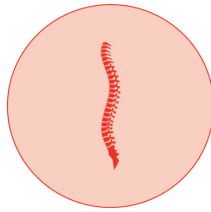
Sidhu K, *Filezio M, Abouassaly M, & **Ferri-de-Barros F**. Arthrodiastasis for the treatment of avascular necrosis as a complication following femoral neck fracture in children: a case report and systematic review. International Perthes Study Group Annual Meeting (Podium) June 2022.

Sidhu K, *Filezio M, *Singh V, & **Ferri-de-Barros F**. Radiographic reporting in adolescent idiopathic scoliosis: is there a discrepancy comparing radiologists' reports and surgeons' assessments? Canadian Spine Society Annual Meeting. Virtual (Podium), April 2022.

*Singh V, *Filezio M, **Parsons D**, & **Ferri-de-Barros F**. Pedicle screw malposition rate and 'time-to-instrument' for pedicle screw instrumentation techniques in an on-site simulation experiment model. First prize, Fellows Research Symposium, May 2022.

2021

Sidhu K, *Filezio M, Abouassaly M, & **Ferri-de-Barros F**. Arthrodiastasis for the treatment of avascular necrosis in pediatric patient following a traumatic femoral neck fracture. Leaders in Medicine Research Symposium, Virtual (Poster), Nov 2021.



ACH Grants

1-Jul-2021 to 30-Jun-2022

Active Research Grants (Bold denotes Spine Program Faculty)

Marcos de Almeida Matos (PI), **Ferri-de-Barros F** (International consultant, Co-I), et al. Critical approach about the waiting line for Adolescent Idiopathic scoliosis surgery in the Brazilian Health System. R\$ 228,000 Brazilian Ministry of Health, Brazilian Ministry of Science and Technology, Brazilian National Council of Research (CNPq), Brazilian Spine Society (SBC).

Meves R, MD, PhD (PI), Marcos de Almeida Matos, MD, PhD (national consultant) **Ferri-de-Barros F** (International consultant-Co-I), et al. National registry of scoliosis in children (Brazil). R\$ 240,000 Medtronic. Brazilian Spine Society

Ferri-de Barros F (CO-PI), Thull-Freedman J, Thompson, B. Improving Patient-Centred Care and Value in the Management of Low-Risk Fractures by Incorporating a Shared Decision Making Model at the Alberta Children's Hospital. Alberta Health Services CAD\$ 21,439

ACH Administrative Contributions

Regional

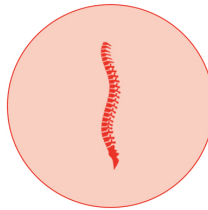
Ferri-de-Barros F. Executive Committee, Centre for Global Surgery, Department of Surgery, University of Calgary

Ferri-de-Barros F. Department of Pediatric Surgery, University of Calgary: Child Health Quality Committee (January 2015-present)

Ferri-de-Barros F. Division of Paediatric Surgery Quality and Safety Lead August (2019-2022)

Ferri-de-Barros F. Pediatric spine fellowship director, Alberta Children's Hospital, University of Calgary (2011 to present)

Ferri-de-Barros F. Safest Together and SSI prevention initiative (2018-present)



National

Ferri-de-Barros F. Canadian Pediatric Spine Society, President (2019 to 2021)

Ferri-de-Barros F. Member of the subcommittee of the Canadian Pediatric Spine Study Group for the pediatric spine registry initiative (March 2014 to present)

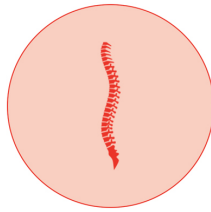
International

Ferri-de-Barros F. Member of the POSNA Paediatric Orthopaedics Global Outreach committee (2020 to present)

Alberta Health Services (ACH)

Surgeries by procedure code from 1-Jul-2021 to 30-Jun-2022 listed for Dr. Ferri-de-Barros and Dr. Parsons.

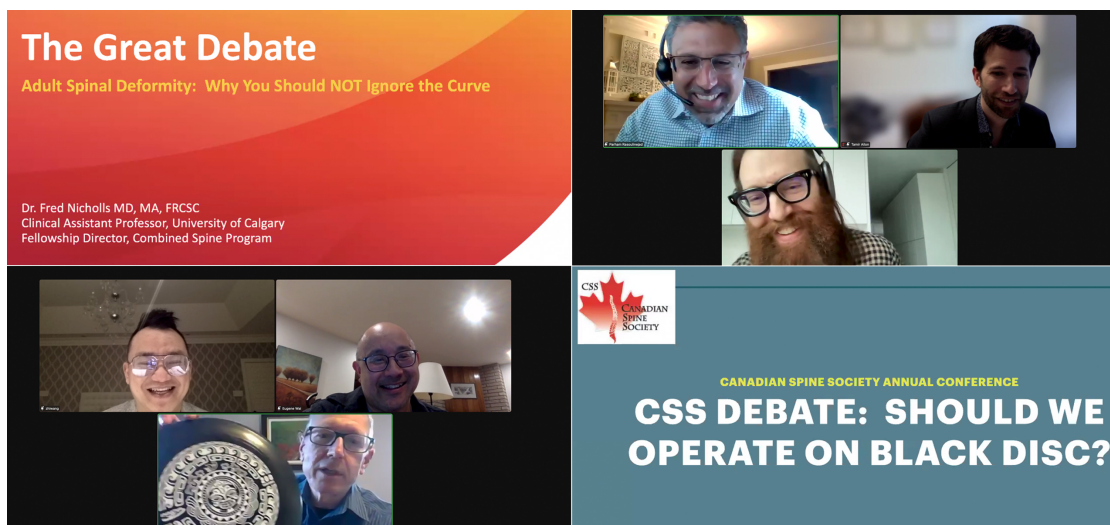
Procedure Group	2021/2022
Spine ACH only	57
Misc Spine (includes spine tumor, neuro spine shunt, cranial halo application, spine cord tumor/excision lipoma, spine lum pos detether fatty filum terminale, spine lum pos pseudo meningo/cystocele repair, spine pos laminoplasty with rhizotomy 1-2 levels & spine pos laminoplasty with rhizotomy 3+ levels)	21
Totals	78



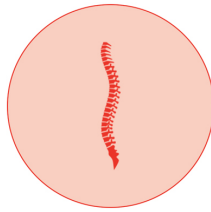
EVENTS & INITIATIVES

Canadian Spine Society

For the second year, the Canadian Spine Society (CSS) meeting was held in a virtual format due to the ongoing COVID-19 pandemic. Sessions took place on a series of Wednesday evenings throughout the month of April and included live podium presentations, symposiums, debates, and virtual exhibits. In fine CSS tradition, each evening began with a virtual tour of Canada's Wine Making regions guided Master Sommelier, Veronique Rivest.



The evenings were highlighted by rousing debates amongst Canadian Spine experts, including our own Dr. Fred Nicholls and Dr. Jacques Bouchard. Debates were moderated by peers and topped off with an online vote. These light-hearted yet highly informative sessions gave us a taste of the collegiality we hope to experience in-person next year.



We were pleased to have several Faculty Members, Residents, Fellows, and Students represent the program including:

*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.

*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

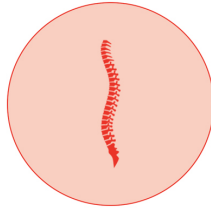
Heard B, **Salo P**, Krawetz R, Hart D, Bains I, **Swamy R**. Expression of Blood Serum Cytokines in the Presentation of Acute Sciatica. (Poster), Canadian Spine Society Annual Meeting - Virtual, April 2022.

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



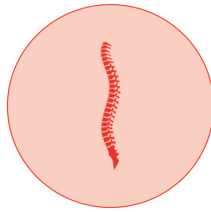
Canadian Spine Outcomes Research Network (CSORN)

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 13,977 enrolments with 1188 added in 2022. Enrollments were down 24% over last year. The Network contains a variety of spine diagnoses and surgical procedures and reflects a predominantly stenotic cohort of patients. There were 177 enrollments added to the prospective studies in 2022. Our cervical spondylotic myelopathy study is now the largest single CSM dataset in the world.

There were 10 studies published in peer-review medical journals this year; an average of one publication every 5 weeks is tremendous productivity. In total, we have produced 40 in-print/in-press publications. The CSORN website is now live: csorncss.ca

Our site enrolled 465 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, 73% of our CSORN patients were enrolled from Caleo health, a multi-disciplinary clinic in the Northwest. 27% 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:

- 6-18-week follow-up 93%
- 1-year follow-up 94%
- 2-year follow-up 95%

In addition to our participation in national CSORN sub-studies (cervical myelopathy, degenerative spondylolisthesis, and adult spinal deformity), several local prospective and retrospective studies are also underway/completed including:

- Natural History of Mild Degenerative Cervical Myelopathy: an observational study.

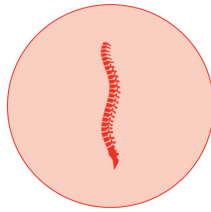
Dr. David Cadotte

- Personalized decision making after a diagnosis of cervical myelopathy: quantitative MRI within an artificial intelligence framework.

Dr. David Cadotte

- Midterm outcomes of anterior lumbar disc replacement: a comparison between stand-alone disc replacement and hybrid anterior fusion and disc replacement.

Dr. Jacques Bouchard



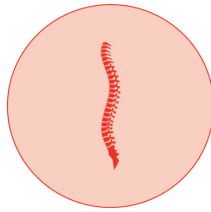
Rick Hansen Spinal Cord Injury Registry

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



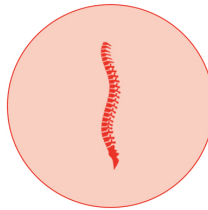
Innovations

Studying Normative Spinal Alignment

Assessment of overall alignment is crucial to appropriate clinical decision making in spine surgery. A considerable amount of effort has been expended in trying to define normal alignment of the thoracolumbar spine. This knowledge has expanded over the last decades beyond simple average values for basic anatomic parameters to more personalized data dependent on age and pelvic morphology. This understanding has helped spine surgeons in evaluating deformity and planning surgical intervention. Despite these efforts, alignment remains incompletely understood, and mechanical complications after deformity correction remain commonplace.

To this end, our group has amassed the largest database in the world of normative radiographs in young, healthy volunteers. We have collected biplanar stereoradiographic images of the entire skeleton using the EOS system, and then segmented these images into coordinate data using a semi-automated analysis software to help future-proof our data and promote ongoing analysis and collaboration. Our group initially set out to define patterns in alignment of the cervical spine and relate these to lumbopelvic alignment and previously described patterns of thoracolumbar alignment. We are using machine-learning algorithms to help define and categorize this complex relationship, showing promising results with up to a 90% rate of successful prediction.

The facility with which our data can be reapplied to other studies has allowed for projects validating previous expert opinion classification systems such as the AMES-ISSG classification of cervical spinal deformity and independent verification of Roussouly's morphotypic classification. Collaboration with our colleagues in trauma surgery has allowed us to validate their previous work on the femorotibial ratio, while collaborative efforts with Orthopaedic surgeons devoted to hip preservation surgery has yielded improved definition of the anatomic relationship between lumbopelvic and femoroacetabular alignment. To date, this project has produced presentations nationally and internationally for 3 residents and 5 fellows, with 2 publications currently in submission and 2 more in preparation.



We are now working to more clearly define patterns of degeneration and the development of adult spinal deformity through both comparative cohort analyses with international partners and through longitudinal study of our own cohort. While this study is clearly a long-term undertaking, our hope is that it will set a new standard for understanding alignment and aging, helping to redefine how we provide surgical care.

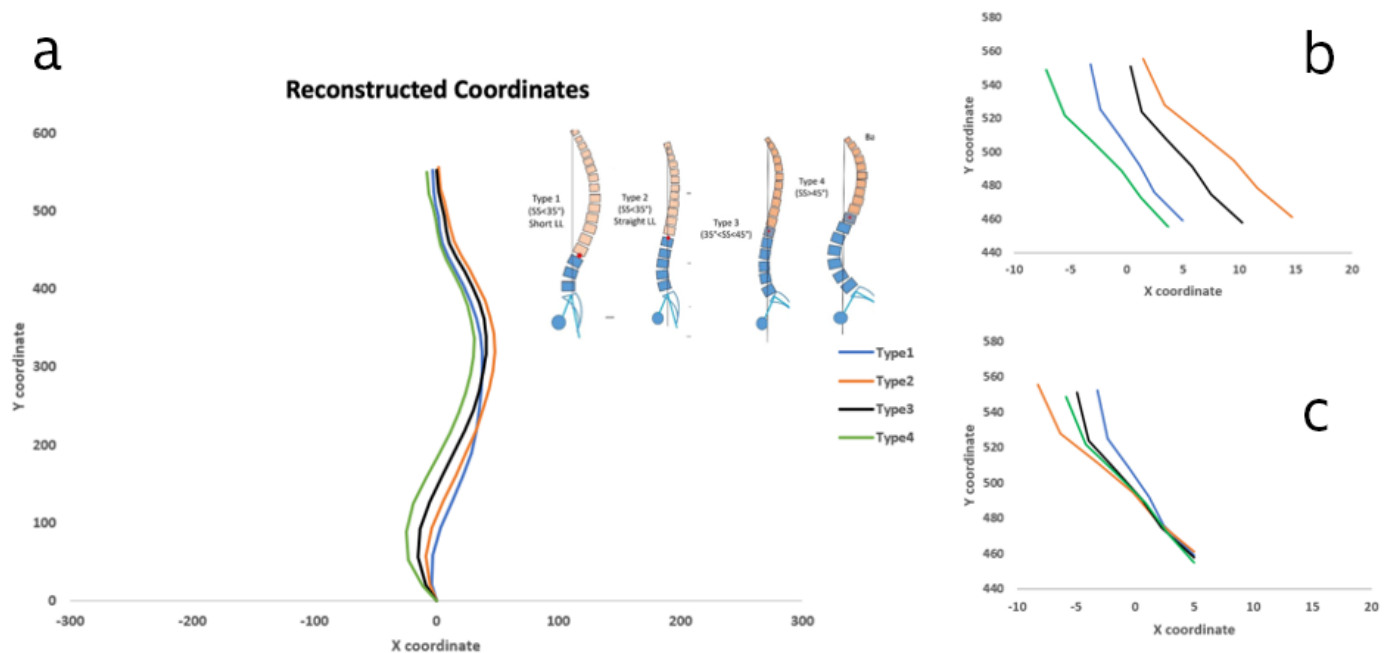


Figure 1
Reconstructed mean coordinate data demonstrating Roussouly morphotypes 1-4, with extension into the cervical spine. Data are shown with x-axis origin uniformly adjusted to the mid-point of the superior end plate of S1 (a & b) and of T1 (c).

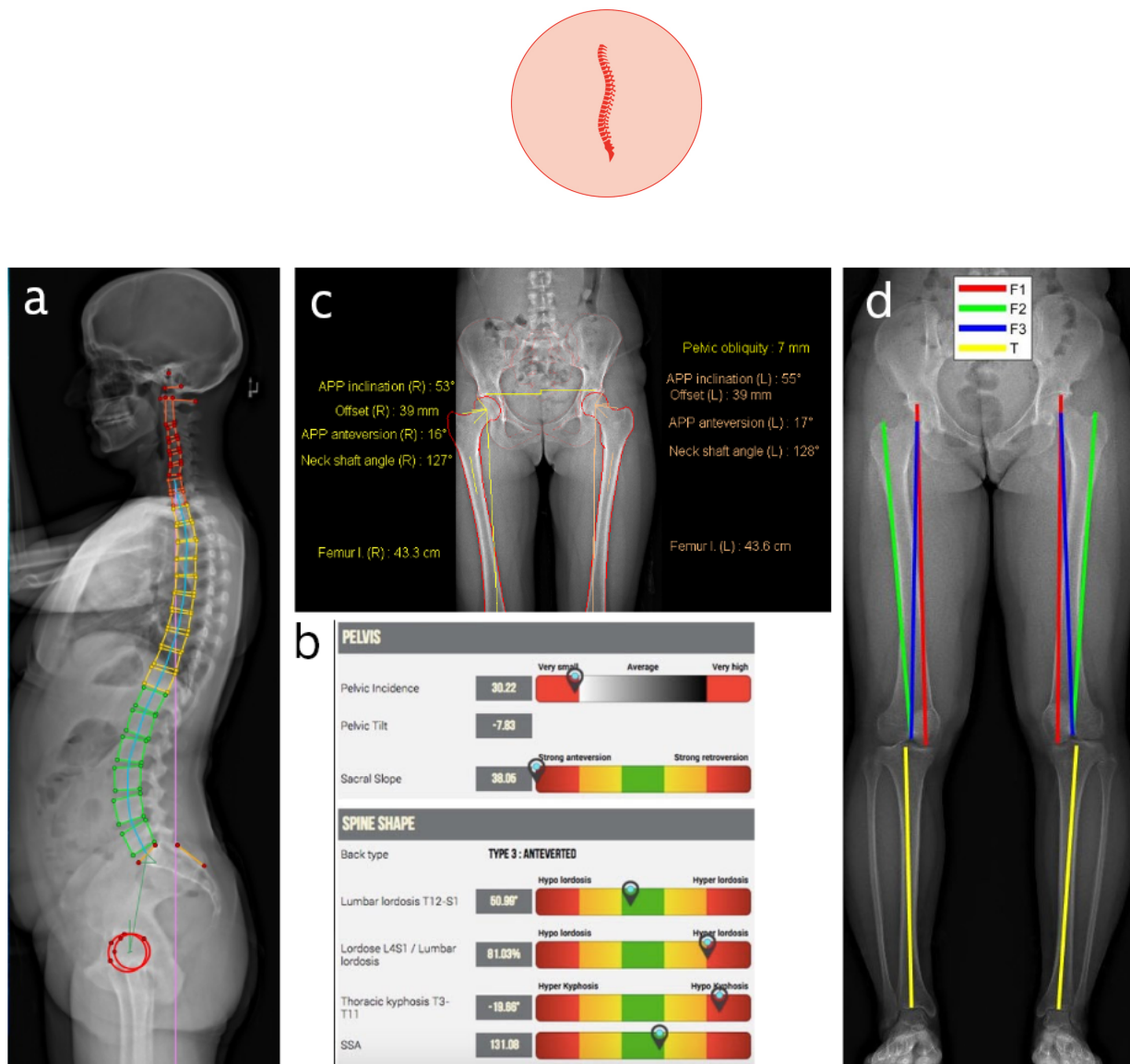
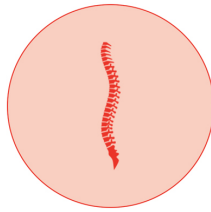


Figure 2
Sample output images of (a) spinopelvic segmentation with basic output (b), femoroacetabular alignment obtained through 3D reconstruction (c), and 2D lower extremity measurements (d).

Dr. Fred Nicholls



Transitional Outpatient Pain Program (TOPPS) Update: Acceptance Commitment Therapy for Spine Pain

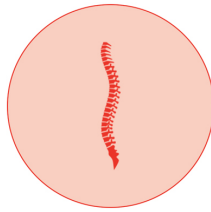
The Transitional Outpatient Pain Program for Spine Surgery (TOPPS) is an interdisciplinary outpatient transitional pain program based at Caleo Health in Calgary. Patient centered individual care is provided through a team-based model involving pain physicians, surgeons, addiction medicine specialists, psychiatrists, nurse practitioners, physiotherapists, and kinesiologists. Where possible the program is started prior to elective surgery and has pre-operative and post-operative components.

The pre-operative phase is 12 to 24 weeks in duration, and includes an educational session and 4 weeks of Acceptance and Commitment Therapy (ACT) with the following goals:

1. Opioid tapering (reduction or cessation)
2. Reduction of pain behaviors
3. Reduction of kinesiophobia
4. Treatment of Psychiatric Co-morbidities

Acceptance Commitment Therapy (ACT) is a relational frame form of cognitive behavioral therapy that aims at changing an individual's relationship with their thoughts by flexibly engaging in values-based behaviors to establish a meaningful life in the presence of painful experiences (1). A number of programs are utilizing ACT as a psychotherapeutic treatment approach for chronic pain. In fact, a randomized control study by Dindo et al (2018) supported a moderating positive effect of a one-day ACT workshop on post-operative pain and opioid cessation in veterans undergoing joint arthroplasty (2).

Locally, TOPPS was developed as a pilot project for degenerative spine patients undergoing decompressions and short-segment fusions. Analysis of our local data prior to implementation of the TOPPS program showed that chronic opioid use was prevalent among adult spinal deformity patients, with 64.3% of patients being on opioid analgesia prior to surgical intervention (average dose 125.6 MED). Chronic opioid use had a negative impact in spine surgery patients and was associated with more frequent involvement of the acute pain service, more frequent use of lidocaine and ketamine infusions, higher post-operative opioid use, and a higher incidence of peri-operative complications. Two years



after surgery, 59% of patients who were on chronic opioids prior to surgical intervention were still relying on opioid analgesia.

These results have shown that adult spinal deformity patients are a group that is often on high doses of opioid analgesia prior to surgery. Thus, spine surgery patients were identified as a high priority population in whom to implement a pre-operative opioid tapering program. As a result, TOPPS has now been implemented as standard of care for many selected patients undergoing surgery at the Foothills Hospital. More recently, Tanguay et al. (2020) have also shown a significant reduction in post-operative opioid use, pain disability, and pain catastrophizing in post-operative spine patients who engage in a transitional pain program where ACT is a component (3).

Evolution of ACT for Spine Pain TOPPS

2018-2020

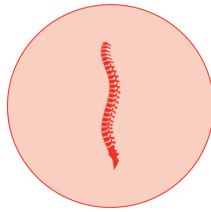
- 8 weekly in-person sessions
- Psychiatrist/Physician/Psychologist led.
- Attended supported by pain and addiction physicians, psychologists and kinesiologists.
- Issues - attrition, scheduling pressures, remote patients

2020

- Modified - 1 week education, 4 weekly sessions.
- Delivery – online, reduced attrition, improved access
- Currently limited to priority, surgical spine patients pre-operatively, with risk factors for poor outcomes

2021

- Dr. Ganesh Swamy, Dr. Alex Soroceanu, Dr. Denise Eckenswiler, Dr. Robert Tanguay and Dr. Elias Soumbasis are planning a prospective observational study to begin in 2022. The study aim is to evaluate the TOPPS program, including a 5-week ACT group therapy program, implemented prior to elective spine surgery, and specifically assess its impact on improving psychosocial measures, patient reported pain and disability outcomes, and peri-operative resource utilization.
- Hypothesis: A multi-disciplinary Transitional Outpatient Pain Program, including psychoeducational ACT group therapy sessions, will decrease opioid use pre-



operatively, leading to decreased peri-operative resource utilization in spine surgery patients, along with decreased post-operative pain scores, improved patient outcome measures, and significant cost savings.

2022

- In 2022 47 patients completed the pre-operative component of the program, and 4 patients of those 47 have completed the post-operative component. They have been discharged from TOPPs.
- All patients who completed the program and were discharged from TOPPs have reduced daily opioid use to 0.
- The remaining 43 patients either remain on pre-operative waiting lists or are in the post-operative follow-up and tapering phase of the program.
- Data collection from self reports measures were collected pre-operatively prior to starting the TOPPs program. Post-ACT and post-operative self report data collection is ongoing. We are currently developing and implementing team-based procedures to reduce attrition and enhance longitudinal data collection.
- Data analysis is ongoing as we await post-ACT and post-operative measures. In 2023, the program will be continued with the same structure. Emphasis will be on collecting and analyzing data.

1. Dindo L, Zimmerman MB, et al. Acceptance and commitment therapy for prevention of chronic post-surgical pain and opioid use in at-risk veterans: a pilot randomized control study. *J Pain* 2018; 19(10): 1211-1221.
2. Azam MA, Weinrib AZ, et al. Acceptance and commitment therapy to manage pain and opioid use after major surgery: Preliminary outcomes from Toronto General Hospital Transitional Pain Service. *Canadian Journal of Pain*. 2017; 1:37-49.
3. Tanguay RT, Eckenswiler DM, et al. A QI/QA assessment of the Transitional Outpatient Program for Spine (TOPPS) to improve spine surgery outcomes. Submitted. 2020.

Dr. Denise Eckenswiler

STAFF UPDATES

DR. PAUL SALO RETIRES

“an integral part to creating our world class spine surgery presence”



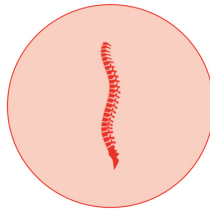
It is my pleasure to honour and thank Dr. Paul Salo, MD, FRCSC, Professor of Surgery, for his friendship and leadership personally and to the University of Calgary Spine Program.

Paul is a unique individual whom I met during the first years of my residency at the University of Alberta in 1985. At that time there was an intense rivalry between the two residency programs, most clearly presented at the Annual Alberta Resident's Research Day. This, like all “Battles of Alberta” usually ended with each program alternating in bringing home 2 of the 3 annual prizes.

It was at this venue and others between the two Alberta programs that I became aware of Dr. Salo. Always soft spoken, well dressed, knowledgeable, no nonsense and frequently quite acerbic in wit. It was hard not to take notice of Dr. Salo. Over the years, these characteristics have not changed, and he remains THE individual who has the best turn of a phrase, and the most insightful observations, usually with the most economy of words.



In 1998, shortly after I arrived in Calgary, it was obvious that creating and growing a Spine Program is a team sport, and we needed to bring hitting power to the team. Paul's successful recruitment back to Calgary was an integral part to creating our world class spine surgery presence. It's my impression that Paul has always had a strong vision of what life should be like:



- Provide the best care possible to patients. This means knowing when to operate, but often knowing when not to operate.
- Teach others to be the best that they can be.
- Further knowledge through research in the field of musculoskeletal injury and disease.
- Be an active participant in the University, the Hospital and the Community.
- Never turn away a good meal, or a good glass of wine.
- See the world and enjoy what it has to offer.
- And... see continuous improvement in his golf game.

Paul's clarity of vision has been demonstrated by positions and accolades received over his career which include:

- Tenured Professor of Surgery, University of Calgary
- Grant reviewer of CIHR and the Arthritis Society
- Journal reviewer for multiple journals
- Membership in professional societies
- Chief of the Section of Orthopaedics 2011- 2019
- Chair McCaig Institute Research Committee 2018 – present
- Faculty Research Director, Section of Orthopaedics 2014 – 2022
- Alberta Heritage Foundation for Medical Research, Clinical Investigator Award, Scholar Award and Senior Scholar Award 1998 – 2015
- Clerkship Teaching award Class of 2000
- North American Spine Society AME Travelling Fellowship 1993
- Arthritis Society Basic Science Fellowship 1990 – 1992
- R. S. McLaughlin Fellowship 1989
- N. Tait McPhedran Award 1987
- Basic Science Prize, Resident research day 1985
- Graduate Student supervision MSc/PhD – total of 14
- Peer reviewed publications - 81
- Book chapters – 3

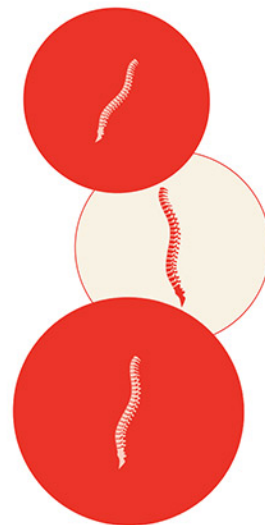
I suspect that all these positions and accolades have been rewarding, however, I somehow feel that Paul is the happiest when he is sitting down to a meal with Karen savouring a glass of wine, perhaps after a great day on the links, or after a day of slow cooking some ribs or a brisket on his wood pellet smoker or after touring an exotic new locale. I also suspect that Paul will continue to be involved in the Spine Program in some capacity, and I hope to see as much or more of him in the future.

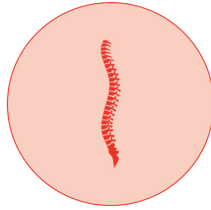
With deepest gratitude, Thank You!

Dr. Richard Hu

SOCIAL EVENTS

We were finally able to raise a glass together in person for the ASF Holiday Party, held December 4, 2021, at Pasquales. We took the opportunity to celebrate and honor the retirement of Lerry Hubbs, long-time representative for Medtronic.





A Spring celebration for the graduation of our spine fellows was held June 18, 2022, at Modern Steak. Dr. Cowley surprised the group by performing a Haka, a traditional Māori dance, representing a tribe's pride, strength and unity. We wish all the best to Dr. Osama Aldahamsheh, Dr. Lukas Burger, Dr. Richard Cowley and Dr. Matthew Coyle as they embark on careers in spinal surgery.





Images courtesy of Tara Whittaker Photography
www.tarawhittaker.com