



UNIVERSITY OF
CALGARY
SPINE PROGRAM

*Annual
Report*

2018/2019





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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 bedside clinical care.

The program is centered at the Foothills Hospital and Alberta Children's Hospital within Alberta Health Services. Members of the Spine Program have joint appointments in the Division of Neurosurgery, Department of Clinical Neurosciences and Division of Orthopedic Surgery, Department of Surgery.

The Spine Program provides care for patients with spinal 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, Orthopedic Surgery, Nursing, and Orthotics.



Dr. Brad Jacobs
Program Chair

Our program offers a comprehensive Spine Surgery Fellowship training under the leadership of Dr. Fred Nicholls. The spine Fellowship at the University of Calgary is a combined Orthopaedic and Neurosurgical clinical experience with the goal of training Orthopaedic and Neurosurgical surgeons in the diagnosis and surgical management of diseases of the entire spine. Trainees gain a breadth of experience with anterior and posterior approaches to all regions of the spine for both less-invasive and open procedures.

Dr. Ken Thomas leads our research program with current projects underway concerning topics ranging from spinal cord injury/regeneration to recent advancements in minimally invasive techniques. In addition, our program is participating in a Nation-wide spine surgery registry that allows Canadian centers to collect a common dataset and thus collaborate in pertinent national spine research and advocacy.

We are proud of the University of Calgary Spine Program and grateful to those surgeons, allied health providers, administrators and industry partners who paved the way for what it is today.

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. Fabio Ferri-de-Barros
- Dr. Richard Hu
- Dr. Peter Lewkonja
- Dr. Fred Nicholls, Fellowship Director
- Dr. David Parsons
- Dr. Paul Salo
- Dr. Alex Soroceanu
- Dr. Ganesh Swamy
- Dr. Ken Thomas, Research Director

- *Allied Health*

- Ken Moghadam, Certified Orthotist (CO) Cascade Orthotics
- Rob Cameron, CO Cascade Orthotics
- Drew Anholt, CO Cascade Orthotics
- Jeff Wright, CO Cascade Orthotics

- *Nursing Staff*

- Bruce Chatterton, OR nurse clinician
- Erin Fischer, OR nurse clinician

- *Nurse Practitioners*

- Patti Long, Neurosurgery
- Carla Dean, Neurosurgery
- Erin Villard, Neurosurgery
- Ron Prince, Neurosurgery

- Nicole Miller, Orthopedics

- *Research Staff*

- Tara Whittaker, Research Nurse
- Ish Bains, Research Coordinator
- Saswati Tripathy, Research Coordinator
- Ariana Frederick, Research Coordinator
- Lasantha Gunasekara, Research Associate

- *Spine Fellows*

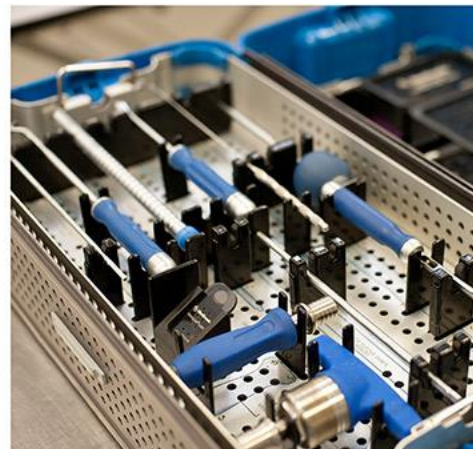
- Dr. Ahmed Aoude
- Dr. Sultan Aldebeyan
- Dr. Sasha Rogers
- Dr. Kedar Padhye (ACH)

- *Neurosurgery Residents 2018-2019*

- | | |
|----------------------------|--|
| ○ Ahmed Alaqeel (R6) | ○ Magalie Cadieux (R4) |
| ○ Michael Avery (R6) | ○ David Ben-Israel (R4) |
| ○ Michael Opoku-Darko (R6) | ○ Sandeep Muram (R3) |
| ○ Andrew Ryu (R6) | ○ Nicholas Sader (R3) |
| ○ Albert Isaacs (R5) | ○ Madeleine de Lotbiniere-Bassett (R2) |
| ○ Stevan Lang (R5) | ○ Matthew Eagles (R2) |
| ○ Rita Nguyen (R5) | ○ Abdulrahman Albakr (R1) |
| ○ Candice Poon (R5) | ○ Benjamin Beland (R1) |
| ○ Michael Yang (R5) | |

- *Orthopaedic Residents 2018-2019*

- | | |
|--------------------------------|-------------------------|
| ○ Sahil Kooner (R5) | ○ Sarup Sridharan (R3) |
| ○ Jeremy Kubik (R5) | ○ Daniel You (Research) |
| ○ Cory Kwong (R5) | ○ Michael James (R2) |
| ○ Alexander Meldrum (R5) | ○ Taryn Ludwig (R2) |
| ○ Spencer Montgomery (R5) | ○ Jennifer Purnell (R2) |
| ○ Jonathan Bourget-Murray (R4) | ○ Murray Wong (R2) |
| ○ Eva Gusnowski (R4) | ○ Annalise Abbott (R1) |
| ○ Kate Thomas (R4) | ○ Brent Benavides (R1) |
| ○ Lee Fruson (R3) | ○ Jayd Lukenchuk (R1) |
| ○ Joseph Kendal (R3) | ○ Laura Morrison (R1) |
| ○ Madison Litowski (R3) | |





clinical activity

Surgical Sites:

Foothills Medical Centre

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

Alberta Children's Hospital

Alberta Children's Hospital provides tertiary and quaternary care dedicated to pediatric spine surgery patients and their families. On average, 35,000 children per year attend our multidisciplinary orthopaedic clinics and over 1,000 orthopaedic operative procedures are performed each year. 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 2018/2019 the paediatric spine team performed 85 spine surgeries.

Canadian Surgery Solutions

Canadian Surgical Solutions 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 for the Workers Compensation Board.

Consultation Services:

Spine Triage and Assessment Clinic (STAC)

The Spine Triage and Assessment Clinic (STAC) has now been operational for 15 years. Working out of the 12th floor at the Foothills Medical Center as a DCNS clinic-the primary function of STAC is to provide triage and assessment to residents of Southern Alberta; and to determine if patients are surgical candidates (probable and possible). Early identification of both surgical and non-surgical candidates facilitates the management of both surgical and non-surgical patients and leads to greater efficiency of care.

Educational initiatives about the indications for referral and diagnostic imaging requirements have been developed with community partners. General Practitioners, Physiotherapists and Chiropractors can attend onsite visits to STAC and educational sessions have been scheduled in the community. In addition, Residents in Physiatry are being exposed to STAC with future plans to involve Family medicine and Emergency medicine residents as well. Training and education in the management of patients with spine-related problems should decrease the number of unnecessary referrals, decrease wait times and improve overall satisfaction.

From July 1, 2018 to June 30, 2019 the clinic received a total of 3498 referrals from the community and other specialists. This is a 22% increase from 2017/2018; the increased volume has been a challenge, but has been managed successfully by the motivated administrative team and the clinical assistants: Randi, Katie, and Drs. Gaekwad, Shao and Kandil. As clinic time and space resources have not increased the team has worked in collaboration with the medical leads to refine the acceptance criteria to ensure that patients seen in clinic are appropriate and that services rendered are effectively and efficiently distributed. The total number of new patients seen during this same time was 1741. The STAC team is grateful for our Physiatry partners from Kinesis and the ongoing support of the whole team committed to improving spine care in Alberta.

Dr. Stephan du Plessis

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. Nine 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. There has been excellent collaboration from all Neurosurgeons, Orthopaedic Surgeons and Emergency physicians in referring the appropriate patients in a timely fashion.

Overall Surgical Wait Times

The wait time that elective surgical patients experience from initial referral by their primary care physician through until the surgical date is a difficult metric to quantify. Considering patient wait lists for triage, surgical consultation as well as surgical waitlists the estimated patient wait time is up to 22 months.



Surgical Activity:

Alberta Health Services (all sites)

Overall by Procedure Code

Surgeries from 1-Jul-2018 to 30-Jun-2019

<i>Level</i>	<i>Procedure Group</i>	<i>Case Count</i>	<i>Category Totals</i>
Cervical	Cerv Ant Arthroplasty	15	
Cervical	Cerv Ant Arthroplasty w/Fusion	8	
Cervical	Cerv Ant Fusion/ACDF	184	
Cervical	Cerv Postr Fusion/Inst	67	
Cervical	Cerv Postr Decompression	24	
Cervical	Cerv Postr Decompression MIS	25	
Cervical	Cerv Postr Fusion/Laminoplasty	6	
Cervical	Cervical 2 Stage	12	341
Thoraco-lumbar	Tho/Lum 2 Stage	98	
Thoraco-lumbar	Tho/Lum Ant Arthroplasty	16	
Thoraco-lumbar	Tho/Lum Ant Arthroplasty w/Fusion	10	
Thoraco-lumbar	Tho/Lum Ant Fusion	20	
Thoraco-lumbar	Tho/Lum Postr Decompression	418	
Thoraco-lumbar	Tho/Lum Postr Decompression MIS	326	
Thoraco-lumbar	Tho/Lum Postr Fusion MIS	96	
Thoraco-lumbar	Tho/Lum Postr Fusion/Inst	367	
Thoraco-lumbar	Tho/Lum 3 Stage	5	
Thoraco-lumbar	Tho/Lum Fusion DLIF short segment	6	
Thoraco-lumbar	Tho/Lum Fusion OLIF short segment	2	
Thoraco-lumbar	Tho/Lum Postr Fusion Combined Open/MIS	3	1367
Misc Spine *	Misc Spine	118	118
ACH	ACH Only Spine Codes	85	85
<i>Grand Total**</i>		1911	1911

For the 1911 cases, the total cases minutes were 439894, whereas the skin-to-skin (surgical) time was 280392 minutes or 64% of total case time.

* 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.

** Cases listed above for the following surgeons: Benour, Bouchard, Cadotte, Casha, Cho, Cundal, du Plessis, Ferri-de-Barros, Gallagher, Hu, Jacobs, Lewkonja, Nicholls, Parsons, Salo, Soroceanu, Swamy, Thomas.

Canadian Surgical Services (CSS) Surgeries from 1-Jul-2018 to 30-Jun-2019

Dr. Nicholls, Dr. Cho and Dr. Salo completed a total of 64 lumbar cases at CSS during 2018/2019.

Inpatient Spine Care: Unit 101



2018-2019 has been a year of transition for Unit 101. Brooke Nowicki was promoted to Manager of Units 101 and 112 in June of 2019, and managed both areas without the assistance of a unit manager. Dr. Steve Casha has taken the role of Division Head for the Division of Neurosurgery and Dr. Brad Jacobs is now Chair of the University of Calgary Spine Program. Erika Reinartz has taken the role of Nurse Clinician for spinal cord injury on Unit 58 Neuro Rehab and Christine Stables is starting a Masters of Nursing program on her way to becoming a Nurse Practitioner.

The Unit 101 Quality Council participated in many successful improvements this year, including:

- Development and implementation of a care pathway for lumbar decompression patients
- ADOD – Anticipated Date of Discharge – was implemented in October of 2018 and since implementation, the length of stay on Unit 101 has decreased by half a day (refer to graphic below).
- The 10th Floor Space Optimization Project – you might have noticed that patients, families and staff have more space to maneuver in the corridors of the 10th floor, and that the public elevator bay is clear of clinical equipment.
- Participated in a project-focused on early identification of post-operative urinary retention

Nurses from Unit 101 participated in a novel one-day workshop entitled *Neuro for Non-neuro Nurses*, sharing their expertise in care of spine patients as part of a day aimed at expanding basic neuro knowledge in nurses who are experts in other areas. *Neuro for Non-Neuro Nurses* will now be held as an annual event.

*Julie Reader
Nursing Education
Unit 101*

101 YEAR IN REVIEW

ADOD IN 2019



Orders

HOW MANY PATIENTS HAD ADOD ORDERS ENTERED?

Consistently high, now 100%!



Whiteboard

HOW MANY PATIENTS HAD THE CORRECT ADOD ON THEIR BOARD?

Has improved over time, now consistently over 80%!



Communication

DO PATIENTS AND FAMILIES KNOW ABOUT ADOD?

Consistently improving, now over 75%!



Length of Stay

DID ADOD GET PATIENTS HOME SOONER?

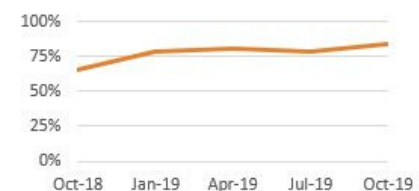
Yes, by half a day!



ADOD Accuracy

DID WE DISCHARGE THE PATIENT ON OR NEAR THEIR ADOD?

Yes, more than 80% of the time!



YOU DID IT!

Adult Spinal Deformity

The Calgary Spine Program can be considered one of the biggest centres in Canada specialising in the surgical treatment of adult spinal deformity. These surgeries are long and complex, and the patients themselves can be just as complex, with many comorbidities and longstanding chronic pain. Dr. Swamy, Dr. Soroceanu, Dr. Thomas, Dr. Jacobs, and Dr. Nicholls meet regularly as a group in order to learn from each other and progress their standard of care for these patients.

Over the recent years, these meetings have been streamlined to focus on 1) discussing as a group the clinical treatment plans of the current patients and 2) reviewing patients and their outcomes 1-2 years post-surgery which has driven a number of clinical initiatives.



The most notable change with the deformity group is its new interdisciplinary nature. Along with the regular spine surgeons, regular attendees to these meetings now also include Nicole Miller, (nurse practitioner), Ariana Frederick (research associate), and our two newest additions: Dr. Sean Stacey and Dr. Kyle Rogan from anesthesiology. Dr. Stacey and Dr. Rogan have collaborated with the group to ensure these complex spine patients get seen in a pre-admission clinic well before their surgery, in order to assess and optimize any medical conditions that may put patients at risk for anesthesia-related complications and to help them in their recovery process following the lengthy surgical procedures. They are also working with the spine group to set up a research initiative examining fluid resuscitation practices at FMC with spine surgical cases that go over several hours and have extensive blood loss. The group also continues to collaborate with Dr. Rob Tanguay and the majority of all deformity patients are referred through the TOPPS program (pain management and peri-operative opioid use). In the last year, the spine unit nurses can attest to the improvements they see from patients who have gone through the TOPPS program. These patients require less narcotics and have a more positive approach the post-op rehab process.

Another big initiative of the deformity group this year was developing a deformity module as part of CSORN, so we can have a Canadian-based deformity registry. A big change we will see as part of this module is x-ray imaging. Since the original CSORN platform cannot accommodate imaging, they will be using a new application called KEOPS. KEOPS is a web-based database platform developed in France, specifically for complex spine cases. It has a semi-automated segmentation algorithm built in to quickly provide measures of spinal alignment. We are hoping to see the deformity module go live across the country at the end of February, following the Canadian Spine Society's annual meeting.

Ariana Frederick
Research Associate

Rehabilitation:

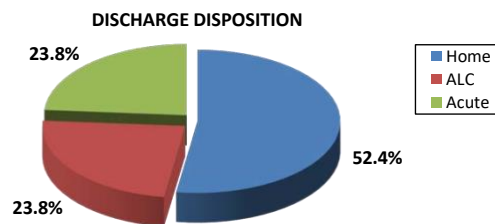
Calgary Spinal Cord Injury Program Data

(July 2018 – June 2019)

BASIC DEMOGRAPHICS	Traumatic	Non-Traumatic	Total
Total # of patients discharged	36	27	63
	57%	43%	

ADDITIONAL DEMOGRAPHICS	Traumatic	Non-Traumatic	Total
Average age	49 years	59 years	54 years
Males	83%	74%	79%
Females	17%	26%	21%

AVERAGE LENGTH OF STAY, LOS (# of days)	Traumatic	Non-Traumatic	Total
Acute LOS (onset days)	35 days	53 days	43 days
Tertiary neurorehab unit	Active LOS	45 days	61 days
	Total LOS	62 days	83 days
Total In-patient LOS	142 days	78 days	110 days



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 Population
Average Admit FIM Score	74.7	82.7	78.9
Average Discharge FIM Score	95.8	103.1	99.6
Change in FIM Score	27.8%	26.4%	27.0%

*Provided by Magda Mouneimne MScOT
Quality Lead, FMC Tertiary Neurorehabilitation Program*



Rounds

Weekly Spine Rounds are held Wednesdays from 7-8 AM in the ICU Classroom. Neurosurgery, Orthopaedic Surgery, Spine Fellows, Neurosurgery Residents, Orthopaedic Residents, Research Nurses 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 take place each Tuesday in a didactic seminar series format.

Undergraduate

Surgeons take part in both scheduled didactic lectures as well as problem-based small-group learning environments. The orthopedic and neurosurgeons play an active role in teaching medical students anatomy and physical examination techniques. Dr. Peter Lewkonja has been the course director for "Course 2", which is the integrated musculoskeletal unit of the undergraduate medical curriculum. He now supervises students as the clerkship lead for spine surgery at Foothills Medical Centre.

Postgraduate Resident

The orthopedic and neurosurgical consultants provide both formal and informal teaching to the postgraduate residents in orthopedics 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.

Each year the Calgary spine program offers a course to senior orthopedic and neurosurgical residents interested in pursuing a career in spine. This is under the direction of Dr. Brad Jacobs. This hands-on cadaver course provides an opportunity to review surgical techniques and implant systems. The course is offered to residents across the country.

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 Orthopaedic and Neurosurgical surgeons in the diagnosis and management of diseases of the spine. The University of Calgary Spine Program is a multidisciplinary group dedicated to the management of individuals with spinal disease. The emphasis of this spine fellowship is upon the decision-making and the 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, deformity correction and instrumentation in areas of the spine from the occiput to sacrum.

- Decompression techniques both anterior and posterior will be acquired. Exposure to multiple different instrumentation systems will occur, including anterior and posterior stabilization of the cervical spine, thoracic spine and lumbar spine.
- Cervical and Lumbar disc arthroplasty.
- Open and less invasive procedures.
- Image guidance/computer-aided surgery.
- An intra-operative MRI surgical suite that is capable of performing cervical, thoracic and lumbar intra-operative imaging.

The Spine Fellowship year runs from July 1 to June 30 of the following year. Time is equally divided between the Orthopaedic and Neurosurgical service. Combined teaching conferences occur weekly with discussion and presentation of recent cases and complex management cases. Monthly presentation rounds occur with the full attendance of Orthopaedic and Neurosurgical house staff and Spine Program attending staff. Weekly outpatient clinics are performed with the attending staff and informal teaching occurs with junior house staff and residents.

Spine Service call occurs for each attending for one week in duration. During this time the house staff and Fellows assigned to the attending surgeon, form the spine team on call. The resident and fellow staff makes initial assessment 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.

Fellows 2018/2019

- | | |
|------------------------|--------------------------|
| ○ Dr. Ahmed Aoude | ○ Dr. Sasha Rogers |
| ○ Dr. Sultan Aldebeyan | ○ Dr. Kedar Padhye (ACH) |



Fellowship Testimonial

I remember receiving my acceptance to complete a Fellowship in Spine at University of Calgary very vividly. I was at the same time considering Harvard, Mayo Clinic and Johns Hopkins. I was very excited, but I have to admit, not too sure about the city and the program. I then decided to find out more and talk to previous Fellows. Their unanimous high appraisal of the program was enough to convince me to join this wonderful team. I am very grateful to have made the right decision every day.

After this fellowship I feel very confident to attack any spine cases whether small or big. This I owe to all my mentors. I now am comfortable to do MIS cases, lateral approaches, anterior approaches, tumor, trauma, degenerative spine, cervical cases and deformity. The team at University of Calgary were all great teachers but also great role models for all Fellows when it came to patient care. I also greatly appreciate the respect and kindness of all operating room staff during my time there.

All these factors make the Spine Fellowship at University of Calgary so highly regarded. I am currently completing a fellowship in orthopaedic oncology in Toronto and find myself doing complex cases daily but feel competent after all the surgical experience and complex cases I completed in Calgary.

I want to thank all my fellowship supervisors for the exceptional mentorship, teaching and most importantly friendships I have built. The reputation of the University of Calgary Spine Program as being the best program in North America are true and warranted.

PS... It's not even been a year and I miss Calgary ... I miss the beauty and peacefulness of the city but also my mentors and colleagues inside and outside the operating room...



Dr. Ahmed Aoude

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.

Postgraduate Continuing Medical Education

Annually, under the direction of Dr. Jacobs, Calgary hosts orthopaedic and neurosurgical residents from across Canada at our Spinal Techniques course. This course is limited to 14 residents with nearly as many surgeon instructors – making the student to teacher ratio very favorable. The course consists of short didactic sessions followed by cadaver labs. The course enjoys the support of our Calgary spine industry partners, as there is a strong emphasis on appropriate use of spinal implants. Once again, the course achieved excellent participant ratings.

Spinal Surgery Course for Operating Room Nurses

Under the guidance of Dr. Jacobs and Dr. Nicholls (Co-chairs), 50 operating room nurses with an interest in spinal surgery were trained by spine faculty members at the Advanced Technical Skills Simulation Laboratory. The objective of the course was to guide the attendees to:

- Distinguish the basic anatomy of the spine
- Learn indications for spinal surgery
- Practice positioning of patients for spinal surgery
- Review Saw Bone-based techniques for spinal instrumentation



2nd Annual Calgary Spine Program Visiting Professor



Dr. Darrel S. Brodke

Professor and Vice-Chair, Department of
Orthopedics, University of Utah

*“The Value of Value
and the
Promise of PROMIS”*

April 26, 2019

Patient-reported outcome measure have become important tools for assessing health status in a variety of patient populations. Many historically or commonly used patient-reported outcome measure in orthopaedics are narrow in scope and are limited by the burden associated with their administration, make them useful only for specific populations. The Patient-Reported Outcomes Measurement Information System (PROMIS) was developed to overcome these limitations. The system was developed using item response theory, which allows for reliable and efficient estimation of underlying health traits using targeted item banks to assess physical function in the upper and lower extremities. PROMIS has been validated in patient populations with orthopaedic disorders of the foot and ankle, upper extremity, and spine and has demonstrated a marked improvement in measurement characteristics and reduced patient and administrative burden. PROMIS Physical Function measures are useful for assessing orthopaedic outcomes and are superior to legacy measure in several key populations.

Brodke DJ, Saltzman CL, Brodke DS. PROMIS for Orthopaedic Outcomes Measurement, J. Am Acad Orthop Surg. 2016 Nov; 24(11):744-749.





This past academic year was very successful for the Calgary Spine Group on the research front. Our Faculty were principal investigators or collaborators on 7, separate externally-funded research grants (worth over \$1.6 million). Faculty members authored 36 peer-reviewed publications and 3 book chapters. In addition, 24 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 two CSORN sub-studies related to cervical spondylotic myelopathy and the surgical treatment of degenerative spondylolisthesis. As the CSORN database continues to mature, I anticipate a steady increase in research studies initiated by our faculty using CSORN data.

In addition to our clinical research efforts, Spine Group members (e.g. Paul Salo, Ganesh Swamy, Steve Casha) 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 many of the recent successes of the Calgary Spine Group research program are a direct result of our 4 excellent, efficient and highly organized research associates: Tara Whittaker, Ish Bains, Saswati Tripathy and Ariana Frederick.



Dr. Ken Thomas
Research Director

CURRENT RESEARCH PROJECTS

Prospective RCTs enrolling	PI	Status
Minocycline (MASC)	Casha	Enrolling
MAPS (Mean Arterial Pressure)	Jacobs	Enrolling
Degenerative Spondy RCT Pilot	Casha/Thomas	Enrolling

Prospective Randomized Clinical Trials in follow-up

INSTRuCT-SCI Study	Casha
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Clinical Studies - Observational

Cervical Myelopathy (CSM)	Cadotte	Enrolling
Degenerative Spondy Cohort Study (CSORN)	Fisher/Casha/Thomas	Enrolling
qMRI & cervical myelopathy (CSORN)	Cadotte	Enrolling
Reoperations rates for pts with inflammatory arthropathy undergoing spinal fusion	Lewkonja	Pending AHS agreement
Acceptance and empowerment after SCI	Lewkonja	Enrolling
Analysis of the Implications of Lumbopelvic Alignment on the Alignment of the Cervical Spine	Nicholls	Enrolling
Pt & Surgeon Expectations various elective spine surg	Thomas/Soroceanu/Aoude	Manuscript prep
Is spine surgery associated with improvement in depressive symptoms?	Thomas/Cushnie	analysis

Prospective Data Collection

Can Systemic inflammatory profiles predict Natural history of lumbar disc herniations	Swamy/Salo	Approved Pending Ethics submission
Torus: Validation of Torus Software	Swamy	Awaiting ethics approval
Quantifying in-vivo cervical spine motion and influence of cervical total discarthroplasty	Swamy/Salo/Bouchard/Kuntze	Awaiting ethics approval
Quantifying chronic opioid use in adult spine deformity patients	Soroceanu	Awaiting ethics approval

Fellows

Does neuromonitoring predict permanent neuro deficits after LLIF	Zafereis/Sirois/Thomas	Manuscript prep
Lumbar Surgery in Octogenarians	Aldebeyan/Nares/Thomas	Manuscript prep
Mild Degenerative Cervical Myelopathy: 2 yr results	Rogers	
Machine Learning to predict a single patient clinical course: how will life change after degen cerv myelopathy diagnosis?	Rogers	
Midterm outcomes of Ant lumbar disc replacement	Aldebeyan/Aoude/Bouchard	Data collection
ACDF cutting jig	Aoude/Thomas/Ronsky	Planning
ALIF/OLIF rescue for L5-S1 nonunion in long construct TL fusion	Jacobs	New Fellow project

Highlight Research Projects

Alberta Children's Hospital

Navigated Sequential Drilling for Pedicle Screw Instrumentation in Scoliosis Surgery

Since 2010, the spine team at the Alberta Children's Hospital (ACH) has managed to reduce the operative times and transfusion rates in scoliosis surgery by over 50% with simple modifications in operative techniques. With such strategies we have improved patient outcomes, reduced the cost per scoliosis surgery by over 20% and reduced the waiting times for spine surgery at the ACH by over 50%. One of the innovative techniques for spinal instrumentation, Sequential Navigated Pedicle Drilling (SNPD), was developed and pilot tested with surgical on-site simulation performed by two ACH surgeons.



Surgical simulation is a highly effective tool for teaching technical skills to orthopedic residents and orthopedic fellows. Spine instrumentation with pedicle screws is a complex procedural competency that is taught during different levels of education in Orthopedics and in Neurosurgery.

Currently, we are in the process of recruiting ten orthopedic residents, ten orthopedic fellows and ten surgeons to participate into our simulation study. Participants will instrument sixty simulation models of a scoliotic spine with ten pedicle screws per model. Four techniques were studied, including the conventional pedicle probe and the innovative sequential drilling technique, with or without CT-based navigation. Our primary outcome measures were efficiency and accuracy of PSI. Our preliminary results were presented in 18th Annual Scientific Conference of the Canadian Spine Society (2018). This study is funded by the Alberta Children's Hospital Foundation.

Quality, Safety, and Value of Innovation in Scoliosis Surgery: Combined Strategies for Improved Outcomes

Posterior spinal instrumentation and fusion (PSIF) has been the standard operative treatment for adolescent idiopathic scoliosis (AIS) and is one of the most frequently performed elective pediatric surgeries in North America, incurring an expenditure of more than \$1.1 billion annually in the United States alone. This study reflects on the outcomes of systematically implementing intraoperative skull femoral traction (IOSFT) combined with navigated sequential drilling (NSD) during PSIF for AIS as strategies for quality improvement at our tertiary children's hospital. This study is ongoing retrospective study and we are comparing the combine strategies (IOSFT and NSD) with NSD alone or PSIF without any of those techniques. Aim of this study is implementing effective strategies to safely improve efficiency. Initial part of the study is already been published.

Published Manuscripts

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

2019

1. *Aoude A, Litowski M, *Aldebeyan S, Fisher C, Hall H, Manson N, Bailey CS, Ahn H, Abraham E, Nataraj A, Paquet J, Stratton A, Christie S, **Cadotte D, Nicholls F, Soroceanu A**, Rampersaud YR, **Thomas K**. A comparison of patient and surgeon expectations of spine surgical outcomes. Accepted for publication, Global Spine J
2. *Bond M, McIntosh G, Fisher C, **Jacobs B**, Johnson M, Bailey CS, Christie S, Charest-Morin R, Paquet J, Nataraj A, **Cadotte D**, Wilson J, Manson N, Hall H, **Thomas K**, Rampersaud YR, Dea N; Treatment of Mild Cervical Myelopathy: Factors Associated with Decision for Surgical Intervention. Canadian Spine Outcomes and Research Network (CSORN) group. Spine (Phila Pa 1976). 2019 Jun 12. doi: 10.1097/BRS.0000000000003124. PMID: 31205181
3. Bourget-Murray J, Brown GE, *Peiro-Garcia A, Earp MA, **Parsons DL, Ferri-de-Barros F**. Quality, Safety, and Value of Innovating Classic Operative Techniques in Scoliosis Surgery: Intraoperative Traction and Navigated Sequential Drilling. Spine Deform. 2019 Jul;7(4):588-595. doi: 10.1016/j.jspd.2018.09.070. PMID: 31202376
4. Bourget-Murray J, **Ferri-de-Barros F**. Reinventing the wheel in scoliosis surgery: effective strategies for safely improving efficiency. Can J Surg. 2019 Feb 1;62(1):7-8. PMID: 30693741
5. **Cadotte DW**, Akbar MA, Fehlings MG, Stroman PW and Cohen-Adad J. What has been learned from magnetic resonance imaging examination of the injured human spinal cord: A Canadian perspective. J Neurotrauma. 2018 Aug 15;35(16):1942-1957. doi: 10.1089/neu.2018.5903. PMID: 30074873
6. Canizares M, Gleenie A, Perruccio A, Abraham E, Ahn H, Attabib N, Christie S, Johnson MG, Nataraj A, **Nicholls F**, Paquet J, Phan P, Rasoulinejad P, Manson N, Hall H, **Thomas K**, Fisher CG, Rampersaud R: Patients' expectations of spine surgery for degenerative conditions: Results from the Canadian Spine Outcomes and Research Network (CSORN). (Spine Journal, Accepted for Publication October, 2019)

7. Curt A, Hsieh J, Schubert M, Hupp M, Friedl S, Freund P, Huber E, Pfyffer D, Sutter R, Jutzeler C, Wüthrich RP, Min K, **Casha S**, Fehlings MG, Guzman R. The Human Spinal Cord is a Promising Target for Allogeneic Neural Stem Cell Transplantation
SSNP Posted: 15 Mar 2019 Under review
8. Cushnie D*, **Thomas K, Jacobs WB, Cho RKH, Soroceanu A**, Ahn H, Attabib N, Bailey CS, Fisher CG, Glennie RA, Hall H, Jarzem P, Johnson MG, Manson NA, Nataraj A, Paquet J, Rampersaud YR, Phan P, **Casha S**: Effect of Preoperative Symptom Duration on Outcome in Lumbar Spinal Stenosis: a CSORN Registry Study. *Spine Journal*. 19(9): 1470-1477, 2019.
9. Garcia AP, You D, *Zafeiris C, **Ferri-de-Barros F, Parsons D**. Ogilvie syndrome following pediatric scoliosis surgery. *J Musculoskelet Neuronal Interact*. 2018 Sep 1;18(3):399-401.
10. Gomez J, Kubat O, Tovar Castro M, Hanstein R, Flynn T, Lafage V, Hurry J, **Soroceanu A**, Schwab F, Skaggs D, El Hawary R, The Effect of Spinopelvic Parameters on the Development of Proximal Junctional Kyphosis in Early Onset Scoliosis – mean 4.5-year follow-up. Accepted for publication, *J. of Pediatric Orthopaedics*
11. Jakubovic R, Guha D, Gupta S, Lu M, Jivraj J, Standish BA, Leung MK, Mariampillai A, Lee K, Siegler P, Skowron P, Farooq H, Nguyen N, Alarcon J, Deorajh R, Ramjist J, Ford M, Howard P, Phan N, Costa LD, Heyn C, Tan G, George R, **Cadotte DW**, Mainprize T, Yee A, Yang VXD. High Speed, High Density Intraoperative 3D Optical Topographical Imaging with Efficient Registration to MRI and CT for Craniospinal Surgical Navigation. *Sci Rep*. 2018 Oct 5;8(1):14894. doi: 10.1038/s41598-018-32424-z. PMID: 30291261
12. Matos MA, **Ferri-de-Barros F**, Guarniero R. Quality of life evaluation in patients with mucopolysaccharidosis using PedsQL. *J Child Health Care*. 2019 Jun;23(2):278-285. doi: 10.1177/1367493518787319. Epub 2018 Jul 18. PMID: 30021476
13. Morcos MW, Jiang F, McIntosh G, Ahn H, Dea N, Abraham E, Paquet J, Natara A, Johnson M, Manson N, Fisher C, Rampersaud R, **Thomas K**, Hall H, Weber M. Predictive Factors for Discharge Destination Following Posterior Lumbar Spinal Fusion: A Canadian Spine Outcome and Research Network (CSORN) Study. *Global Spine J*. 2019 Jun;9(4):403-408.

14. Passias PG, Bortz CA, Segreto F, Horn S, Pierce KE, Alas H, Brown AE, Lafage R, Lafage V, Smith JS, Line B, Eastlack R, Sciubba DM, Klineberg EO, **Soroceanu A**, Burton DC, Schwab FJ, Bess S, Shaffrey CI, Ames CP. Limited morbidity & possible radiographic benefit of C2 vs. subaxial cervical upper-most instrumented vertebrae. *J Spine Surg.* 2019 Jun;5(2):236-244.
15. Passias PG, Jalai CM, Diebo BG, Cruz DL, Poorman GW, Buckland AJ, Day LM, Horn SR, Liabaud B, Lafage R, **Soroceanu A**, Baker JF, McClelland S 3rd, Oren JH, Errico TJ, Schwab FJ, Lafage V. Full-Body Radiographic Analysis of Postoperative Deviations From Age-Adjusted Alignment Goals in Adult Spinal Deformity Correction and Related Compensatory Recruitment. *Int J Spine Surg.* 2019 Apr 30;13(2):205-214
16. Passias PG, Poorman GW, Horn SR, Jalai CM, Bortz C, Segreto F, Diebo BM, Daniels A, Hamilton DK, Sciubba D, Smith J, Neuman B, Shaffrey CI, LaFage V, LaFage R, Schwab F, Bess S, Ames C, Hart R, **Soroceanu A**, Mundis G, Eastlack R, ISSG. Effect of Obesity on Radiographic Alignment and Short-Term Complications After Surgical Treatment of Adult Cervical Deformity. *World Neurosurg.* 2019 May;125:e1082-e1088.
17. *Peiro-Garcia A, Brown GE, Earp MA, **Parsons D**, **Ferri-de-Barros F**. Sagittal Balance in Adolescent Idiopathic Scoliosis Managed With Intraoperative Skull Femoral Traction. *Clin Spine Surg.* 2019 Jun 18. doi: 10.1097/BSD.0000000000000854. [Epub ahead of print]
PMID: 31220037
18. Ren G, Whittaker JL, Leonard C, DeRantere D, Pang DSJ, **Salo P**, Fritzler M, Kapoor M, deKoning APJ, Jaremko JL, Emery CA, Krawetz RJ. CCL22 is a biomarker of cartilage injury and plays a functional role in chondrocyte apoptosis. *Cytokine.* 2019 Jan 7;115:32-44, doi: 10.1016/j.cyto.2018.11.030 [Epub ahead of print]
19. Sankar WN, Lavalva SM, Mcguire MF, Jo C, Laine JC, Kim HKW (**Ferri-de-Barros F**, Collaborator); International Perthes Study Group. Does Early Proximal Femoral Varus Osteotomy Shorten the Duration of Fragmentation in Perthes Disease? Lessons From a Prospective Multicenter Cohort. *J Pediatr Orthop.* 2019 Sep 12. doi: 10.1097/BPO.0000000000001451. [Epub ahead of print] PMID: 31524767
20. Sharifi B, McIntosh G, Fisher C, Jacobs WB, Johnson M, Bailey CS, Christie S, Charest-Morin R, Paquet J, Nataraj A, **Cadotte D**, Manson N, Hall H, **Thomas KC**, Rampersaud YR, Dea N: Consultation and Surgical Wait Times in Cervical Spondylotic Myelopathy. *Canadian Journal of Neurological Sciences.* 46(4): 430–435, 2019.

21. Srinivas S, Paquet J, Bailey C, Nataraj A, Stratton A, Johnson M, **Salo P**, Christie S, Fisher C, Hall H, Manson N, Rampersaud YR, **Thomas K**, McIntosh G, Dea N. Effect of spinal decompression on back pain in lumbar spinal stenosis: A Canadian Spine Outcomes Research Network (CSORN) study. *Spine J.* 2019 Jan 19. pii: S1529-9430(19)30026-9. doi: 10.1016/j.spinee.2019.01.003. [Epub ahead of print].
22. **Thomas K**, Faris P, McIntosh G, Manners S, Abraham E, Bailey CS, Paquet J, **Cadotte D**, **Jacobs WB**, Rampersaud YR, Manson NA, Hall H, Fisher CG. Decompression alone vs. decompression plus fusion for claudication secondary to lumbar spinal stenosis. *Spine J.* 2019 Jun 10. pii: S1529-9430(19)30797-1. doi: 10.1016/j.spinee.2019.06.003. PMID: 31195133
23. Yang MMH, Hartley RL, Leung AA, Ronksley PE, Jetté N, **Casha S**, Riva-Cambrin J. Preoperative predictors of poor acute postoperative pain control: systematic review and meta-analysis *British Medical Journal Open.* 2019;9(4):e025091
24. Yang MMH, Ryu WHA, **Casha S**, **Du Plessis S**, **Jacobs WB**, Hurlbert RJ. Heterotopic ossification and radiographic adjacent segment disease after cervical disc arthroplasty *J Neurosurg Spine.* 2019 Aug 2:1-10.
25. Yang MMH, Yavin D, Dhaliwal P, Stefan T. Lang ST, **Jacobs WB**, ***Casha S**, ***Du Plessis S** (*shared senior authorship). Development and external validation of a clinical prediction model for prolonged hospital stay following elective lumbar fusion surgery. submitted to the *Global Spine Journal* May 2019
26. Yavin D, Dhaliwal P, Whittaker T, Hawboldt GS, Jewett GA, **Casha S**, **Du Plessis S**. Intrathecal morphine following lumbar fusion: a randomized, placebo-controlled trial. *Neurosurgery* 2019 Aug 1;85(2):189-198

2018

1. Ailon T, Tee J, Manson N, Hall H, **Thomas K**, Rampersaud YR, Yee A, Dea N, Glennie A, Bailey C, Christie S, Weber MH, Nataraj A, Paquet J, Johnson M, Norton J, Ahn H, McIntosh G, Fisher CG. Patient Reported Outcomes Following Surgery for Degenerative Spondylolisthesis: Comparison of a Universal and Multi-Tier Health Care System. *Spine J.* 2018 Oct 9. pii: S1529-9430(18)31162-8

2. Ayling OGS, Ailon T, McIntosh G, Soroceanu A, Hall H, Nataraj A, Bailey CS, Christie S, Stratton A, Ahn H, Johnson M, Paquet J, Thomas K, Manson N, Rampersaud YR, Fisher CG. Clinical outcomes research in spine surgery: what are appropriate follow-up times? *J Neurosurg Spine*. 2018 Dec 21:1-8. doi: 10.3171/2018.8.SPINE18715. [Epub ahead of print] PMID: 30579264
3. Badhiwala JH, Wilson JR, Kwon BK, **Casha S**, Fehlings MG. A Review of Clinical Trials in Spinal Cord Injury including Biomarkers. *J. Neurotrauma* 2018; 35(16): 1906-1917
4. Bertram K, Narendran N, Tailor P, Jablonski C, Leonard C, Irvine E, Hess R, Masson A, Abubacker S, Rinker K, Biernaskie J, Yates R, **Salo P**, Narendran A, Krawetz R. 17-DMAG regulates p21 expression to induce chondrogenesis in vitro and in vivo. *Dis Model Mech*. 2018 Oct 8;11(10). pii: dmm033662. doi: 10.1242/dmm.033662
5. Bond M, Zhou H, Dea N, Bailey C, Charest-Morin R, Glennie A, Manson N, Hall H, **Thomas K**, Rampersaud R, McIntosh G, Fisher C. Back Pain in Surgically Treated Degenerative Lumbar Spondylolisthesis: What Can We Tell Our Patients, *Neurosurgery*, Volume 65, Issue CN_suppl_1, September 2018, Pages 129–130, <https://doi.org/10.1093/neuros/nyy303.321>
6. **Casha S**, Rice T, Stirling DP, McGowan D, Silva C, Smekal M, Gnanapavan S, Zygun D, Giovannoni G, Hurlbert RJ, Yong VW. Cerebrospinal Fluid Biomarkers in Human Spinal Cord Injury from a Phase II minocycline trial *Neurotrauma* 2018; 35(16): 1918-1928
7. Mousseau M, Burma NE, Lee KY, Leduc-Pessah H, Kwok CHT, Reid AR, O'Brien, Sagalajev B, Stratton JA, Patrick N, Stemkowski PL, Biernaskie J, Zamponi GW, **Salo P**, McDougall JJ, Prescott SA, Matyas JR, Trang T. Microglial pannexin-1 channel activation is a spinal determinant of joint pain. *Sci Adv*. 2018 Aug 8;4(8):eaas9846. Doi: 10.1126/sciadv.aas9846. eCollection 2018 Aug. PMID 40101191
8. *Teles AR, Yavin D, Zafeiris, C, **Thomas KC**, **Lewkonja P**, **Nicholls F**, **Swamy G** and **Jacobs WB**: Spine Fractures After Removal of Instrumentation: Revisiting the Stress-shielding Effect of Instrumentation in Spine Fusion. *World Neurosurgery*. 2018 Aug;116:e1137-e1143
9. *Teles A, Montgomery S, **Thomas KC**. Necrotizing Fasciitis involving the Spine: An unusual medical emergency for the spine surgeon; *World Neurosurg*. 2018 Oct 12. pii: S1878-8750(18)32324-6.

10. Zygourakis C, DiGiorgio AM, Crutcher C, Safaee M, **Nicholls FH**, Dalle Ore CL, Deviren V, Ames CP: The Safety and Efficacy of CT-Guided, Fluoroscopy-Free Vertebroplasty in Adult Spinal Deformity Surgery. *World Neurosurg*, 116:e944-950; August 2018

Published Book Chapters

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

2019

1. *Aldebeyan S, Ahn J, *Aoude A, Stacey S, **Nicholls F**: Multimodal Perioperative Blood Management for Spinal Surgery. *Operative Techniques in Orthopaedics* 2019 (Book Chapter)
2. **Lewkonja P**, Rawall S. Closed Management of Surgical Spine Injuries. *The Spine: Medical & Surgical Management*. Alexander Vaccaro, Brian W Su, Yan Wang, Marcel F Dvorak, H Michael Mayer, Kazuhiro Chiba, Luiz Vialle, Magdy Gamal Youssef, S Rajasekaran, editors. JP Medical Publishers; 2019.

2018

1. Hardy St Pierre G, **Thomas KC**. Radiculopathy and myelopathy at segments adjacent to the site of a previous anterior cervical arthrodesis in 50 Landmark Papers Every Spine Surgeon Should Know. CRC Press Aug 2018.

Presentations

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

2019

1. Amiri S, **Swamy G**, **Jacobs WB**, **Nicholls F**, **Thomas KC**: Tracked C-arm: A Logical Alternative to Plain Films for Intra-operative Evaluation of Spinal Alignment. Poster presentation at the Global Spine Congress, Toronto, Ontario, May 15 – 18, 2019.

2. *Aoude A, *Aldebeyan S, Ben Israel D, Beland B, **Casha S**. A Canadian Experience with Halo Vest Treatment for Cervical Spine Trauma, Risk Factors and Complications poster presentation at Canadian spine society meeting, Toronto 2019
3. *Aoude A, *Aldebeyan S, Ben Israel D, Beland B, **Casha S**. A Canadian Experience with Halo Vest Treatment for Cervical Spine Trauma, Risk Factors and Complications poster presentation at AO spine congress Global Spine Congress, Toronto 2019
4. Badhiwala J, Wilson JR, **Jacobs WB**, Johnson M, Bailey C, Christie S, Charest-Morin R, Paquet J, Nataraj A, **Cadotte D**, Manson N, Hall H, **Thomas KC**, Rampersaud YR, McIntosh G, Fisher CG, Dea N: Minimum Clinically Important Difference in Patient Reported Outcomes for Cervical Spondylotic Myelopathy: An Analysis from the Canadian Spine Outcomes and Research Network (CSORN). Oral presentation at the 19th Annual Canadian Spine Society Meeting, Toronto, Ontario, February 27 – March 2, 2019.
5. Badhiwala JT, Wilson JR, **Jacobs WB**, Johnson MG, Bailey C, Christie SD, Charest-Morin R, Paquet J, Nataraj A, **Cadotte DW**, Manson N, Hall H, **Thomas KT**, Rampersaud YR, McIntosh G, Fisher C, Dea N: The Minimum Clinically Important Difference in Patient Reported Outcomes for Cervical Spondylotic Myelopathy: An Analysis from the Canadian Spine Outcomes and Research Network (CSORN). Poster presentation at the Congress of Neurological Surgeons Annual Meeting, San Francisco, California, October 20 – 23, 2019.
6. Dakson A, Christie S, **Jacobs WB**, Johnson M, Bailey C, Charest-Morin R, Paquet J, Nataraj A, **Cadotte D**, Wilson JR, Manson N, Hall H, **Thomas KC**, Rampersaud YR, McIntosh G, Fisher CG, Dea N: Neck and Arm Pain After Surgery for Cervical Myelopathy: Outcomes and Predictors of Improvement. Poster presentation at the 19th Annual Canadian Spine Society Meeting, Toronto, Ontario, February 27 – March 2, 2019.
7. Dea N, Sharifi B, Fisher C, Charest Morin R, **Jacobs WB**, **Thomas KC**, Bailey C, Nataraj A, Hall H, Rampersaud RY, McIntosh G, Christie S: Consultation and surgical wait time in patients with cervical spondylotic myelopathy: A prospective Canadian Spine Outcomes and Research Network (CSORN) study. Poster presentation at the Global Spine Congress, Toronto, Ontario, May 15 – 18, 2019.

8. Evaniew N, Charest-Morin R, **Jacobs WB**, Johnson M, Bailey C, Christie S, Paquet J, Nataraj A, **Cadotte D**, Wilson JR, Manson N, Hall H, **Thomas KC**, Rampersaud YR, McIntosh G, Fisher CG, Dea N: Importance of Sagittal Alignment in Cervical Spondylotic Myelopathy: An Observational Study from the Canadian Spine Outcomes and Research Network. Oral presentation at the 19th Annual Canadian Spine Society Meeting, Toronto, Ontario, Feb 27 – Mar 2, 2019.

9. Fehlings MG, Ahn H, Farhadi, HF, Shaffrey CI, Nassr A, Mummaneni PV, Arnold PM, **Jacobs WB**, Riew KD, Kelly MP, Brodke DS, Vaccaro AR, Hilibrand AS, Wilson JD, Harrop JS, Yoon ST, Kim K, Fourney D, Santaguida C, Kopjar B: The Safety and Efficacy of Riluzole in Enhancing Clinical Outcomes in Patients Undergoing Surgery for Cervical Spondylotic Myelopathy: Results of the CSMProtect Double-blinded, Multi-center Randomized Controlled Trial in 300 Patients. Oral presentation at the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Miami, Florida, March 14 – 17, 2019.

10. Fehlings MG, Badhiwala JH, Ahn H, Farhadi, HF, Shaffrey CI, Nassr A, Mummaneni PV, Arnold PM, **Jacobs WB**, Brodke DS, Riew KD, Kelly MP, Harrop JS, Vaccaro AR, Wilson JD, Yoon ST, Fourney DR, Kim K, Santaguida C, Kopjar B: The Safety and Efficacy of Riluzole in Enhancing Clinical Outcomes in Patients Undergoing Surgery for Cervical Spondylotic Myelopathy: Results of the CSM-Protect Double-blinded, Multi-center Randomized Controlled Trial in 300 Patients. Oral presentation at the Congress of Neurological Surgeons Annual Meeting, San Francisco, California, October 20 – 23, 2019.

11. Fehlings MG, Kopjar B, Badhiwala J, Ahn H, Farhadi, HF, Shaffrey C, Nassr A, Mummaneni P, Arnold P, **Jacobs WB**, Riew KD, Kelly M, Brodke D, Vaccaro A, Hilibrand A, Wilson J, Harrop J, Yoon ST, Kim K, Fourney D, Santaguida C: The Safety and Efficacy of Riluzole in Enhancing Clinical Outcomes in Patients Undergoing Surgery for Cervical Spondylotic Myelopathy: Results of the CSMProtect Double-blinded, Multi-center Randomized Controlled Trial in 300 Patients. Oral presentation at the 19th Annual CSS Meeting, Toronto, Ontario, Feb 27 – Mar 2, 2019.

12. Hebert J, Abraham E, Wedderkopp N, Bigney E, Richardson E, Darling M, Hall H, Fisher CG, Rampersaud YR, **Thomas KC**, **Jacobs WB**, Johnson M, Paquet J, Attabib N, Jarzem P, Wai EK, Rasoulinejad P, Ahn H, Nataraj A, Stratton A, Manson N: Patients Undergoing Surgery for Lumbar Spinal Stenosis Experience Unique Courses of Pain and Disability: A Group-Based Trajectory Analysis. Oral presentation at the 19th Annual Canadian Spine Society Meeting, Toronto, Ontario, February 27 – March 2, 2019.

13. *Rogers S, **Jacobs WB, Bouchard J**, Dea N, **Cho R, Casha S, Du Plessis S**, Hurlbert RJ, **Lewkonja P, Salo P, Soroceanu A, Swamy G, Thomas KC, Nicholls F, Cadotte D**: Mild Degenerative Cervical Myelopathy: 2 Year Results of an Ongoing Prospective Observational Cohort. Poster presentation at the Global Spine Congress, Toronto, Ontario, May 15 – 18, 2019.
14. *Rogers S, **Jacobs WB, Bouchard J, Casha S, Cho R, Du Plessis S**, Hurlbert RJ, **Lewkonja P, Salo P, Soroceanu A, Swamy G, Thomas KC, Nicholls F**, Dea N, Forkert N, Mouches P, **Cadotte D**: Machine Learning to Predict a Single Patient Clinical Course: How Will Your Life Change After a Diagnosis of Degenerative Cervical Myelopathy? Poster presentation at the 19th Annual Canadian Spine Society Meeting, Toronto, Ontario, February 27 – March 2, 2019.
15. Sharifi B, Fisher C, **Jacobs WB**, Bailey C, **Thomas K**, Hall H, Nataraj A, Rampersaud RY, Paquet J, **Cadotte DW**, McIntosh G, Dea N: Consultation and surgical wait time in patients with cervical spondylotic myelopathy: A prospective Canadian Spine Outcomes and Research Network (CSORN) study. Oral presentation at the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Miami, Florida, March 14 – 17, 2019.
16. *Teles AR, **Jacobs WB, Nicholls F, Thomas KC, Swamy G**: Mechanical Complications in Adult Spinal Deformity: Can the Alignment Explain Everything? Poster presentation at the Global Spine Congress, Toronto, Ontario, May 15 – 18, 2019.
17. *Teles AR, **Casha S, Jacobs WB, Thomas KC**, McIntosh G, Charest-Morin R, Golan JD, Santaguida C, Jarzem P, Ouellet JA, Weber MH: Predictive model for return to work after lumbar spine surgery in Canada. Oral presentation at the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Miami, Florida, March 14 – 17, 2019.
18. *Teles AR, **Jacobs WB, Nicholls F, Thomas KC, Swamy G**: Mechanical Complications in Adult Spinal Deformity: Can the Alignment Explain Everything? Oral presentation at the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Miami, Florida, March 14 – 17, 2019.
19. Wilson JR, Badhiwala J, **Jacobs WB**, Johnson M, Bailey C, Christie S, Charest-Morin R, Paquet J, Nataraj A, **Cadotte D**, Manson N, Hall H, **Thomas KC**, Rampersaud YR, McIntosh G, Fisher CG, Dea N: Rates and Predictors of Return to Work after Surgery for Cervical Spondylotic Myelopathy: Analysis from the Canadian Spine Outcomes and Research Network (CSORN). Oral presentation at the 19th Annual Canadian Spine Society Meeting, Toronto, Ontario, February 27 – March 2, 2019.

20. Yang MMH, Ryu WHA, **Casha S, Du Plessis S, Jacobs WB**, Hurlbert RJ: Residual Exposed Endplate Predicts High Grade Heterotopic Ossification in Cervical Disc Arthroplasty. Oral presentation at the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Miami, Florida, March 14 – 17, 2019.
21. Yang MMH, Ryu A, **Casha S, Du Plessis S, Jacobs WB**, Hurlbert RJ. Residual Exposed Endplate Predicts High Grade Heterotopic Ossification in Cervical Disc Arthroplasty Podium presentation at Annual Meeting of the Section on Disorders of Spine & Peripheral Nerves, Miami, USA, 2019
22. Yang MMH, Yavin D, Dhaliwal PPS, Lang ST, **Jacobs WB, Casha S, Du Plessis S**: Preoperative Disability Predicts Prolonged Hospital Stay Following Elective Lumbar Fusion Surgery. Oral presentation at the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves Annual Meeting, Miami, Florida, March 14 – 17, 2019.
23. Yang MMH, Yavin D, Dhaliwal P, Lang S, **Jacobs WB, Casha S, Du Plessis S**: Preoperative Disability Predicts Prolonged Hospital Stay Following Elective Lumbar Fusion Surgery. Oral presentation at the 19th Annual Canadian Spine Society Meeting, Toronto, Ontario, February 27 – March 2, 2019.

2018

1. Yang M, Yavin D, Dhaliwal P, Lang S, **Jacobs WB, Casha S, Du Plessis S**. Predictors of prolonged length of stay following elective lumbar fusion surgery Poster presentation at 2018 Congress of Neurological Surgeons Conference, Houston, USA
2. Yang M, Hartley R, Leung A, Ronksley P, Jette N, **Casha S**, Riva-Cambrin J. Preoperative predictors of poor postoperative pain control: systematic review and meta-analysis Podium presentation at 2018 Congress of Neurological Surgery Conference, Houston, Texas

Grants

Active Research Grants (Bold denotes Spine Program Faculty):

1. **Bouchard J.** COREF spine grant: An examination of community performance before and after total disc replacement surgery for degenerative disc disease: The use of computerized activity monitors. Amount \$20,000
2. **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). Amount \$700,000
3. **Cadotte D.** Chief Medical Officer Quality Improvement grant: Keeping the Patient in Focus: Timely Access and Valuable Interaction: A Quality Improvement Initiative. 2018. Amount \$35,000
4. **Casha S.** Rick Hansen Spinal Cord Injury Registry Project. Principle Investigator. 2017-2020. Amount \$60-72,000/yr renewable
5. **Casha S.** Source: Wings for Life Foundation. INSTrUCT-SCI: INdependent observational STUdy of Cell Transplantation in SCI. Co-applicant with A. Curt (U of Zurich) and M. Fehlings (U of Toronto). 2017-2019. Amount: €15,000 (Calgary portion)
6. Krawetz R & **Salo P.** Section of Orthopaedics Clinician Scientist Seed Grant. Characterization of Epidural Fat Stem Cells. 07-2018-06-2019. Amount \$20,000
7. **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
8. **Nicholls F.** Normative Relationship of Spino-Pelvic Alignment to Femoral-Acetabular Orientation:
 - Alberta Spine Foundation Grant \$20,000.00
 - COREF Grant \$5,000.00
 - Total Funding: \$25,000.00
9. **Salo P & Krawetz R.** Alberta Spine Foundation, The Regenerative Potential of Epidural Fat Stem Cells: An in vivo Study to Determine How These Cells Respond to Injury. 10/2018-09/2019. Amount \$20,000
10. Matyas J, **Salo P**, Tomanek B, Trang T, Yates R. Canadian Institutes for Health Research (CIHR). Central and Peripheral Determinants of Acute and Persistent Joint Pain. 07/2016 – 06/2019. Amount \$383,716
11. Matyas J, Biernaskie J, Rosin N, **Salo P**, Stratton J, Trang T, Yates R. Canadian Institutes for Health Research (CIHR). Role of Neuroinflammation in the Development of Chronic Joint Pain. 07/2016 – 06/2019. Amount \$378,429

12. **Swamy G**, Duncan N, Matyas J, **Salo P**, Hart D. Alberta Spine Foundation. Are Sex-Differences in Degenerative Spondylolisthesis and Degenerative Scoliosis Explainable by Mechanical Differences in the Post-Menopausal Intervertebral Disc? 08/2017-07/2019. Amount \$10,000
13. **Swamy G**. McCaig Institute Clinician-Scientist Grant. Are sex-differences in degenerative spondylolisthesis and degenerative scoliosis explainable by mechanical differences in the post-menopausal intervertebral disc? Amount \$10,000
14. **Swamy G**. Alberta Spine Foundation. Can automated imaging analysis of multi-modality spinal imaging be more reliable than human assessors in the CSORN degenerative spondylolisthesis investigation? Amount \$40,000
15. **Swamy G**, **Salo P**. Alberta Spine Foundation & McCaig Institute Encore Grant 2018 (awarded to co-author P. Salo). Can Systemic Inflammatory Profiles predict natural history of lumbar disc herniations? Amount \$60,000
16. **Thomas K**, Ben-Israel D, Spackman E. Alberta Spine Foundation: Annual Grant Competition 2019. Evaluating the optimal timing of surgery for symptomatic lumbar disc herniation: a cost-effectiveness analysis. Amount \$20,000



*administrative
contributions*

Regional

Bouchard J. Faculty advisor University of Calgary, 2001 to present

Bouchard J. Medical student Appeals Committee, 2009 to present

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

Casha S. Head, Division of Neurosurgery, Department of Clinical Neurosciences, University of Calgary

Jacobs WB. Associate Residency Program Director, Division of Neurosurgery, Department of Clinical Neuroscience, Faculty of Medicine, University of Calgary, Calgary, Alberta, Canada. , 2019 to present

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

Jacobs WB. Neurosurgery Residency Competency by Design Director, Division of Neurosurgery, Department of Clinical Neuroscience, Faculty of Medicine, University of Calgary, Calgary, Alberta, Canada. 2018 to present

Jacobs WB. Chair, Division of Neurosurgery Competence Committee, 2019 to present

Jacobs WB. Member, Division of Neurosurgery AMHSP Management Committee, 2017 to 2019

Jacobs WB. Member, Division of Neurosurgery Residency Program Committee, 2016 to present

Jacobs WB. Member, Surgical Undergraduate Medical Education Committee, Faculty of Medicine, University of Calgary, 2013 to present

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

Jacobs WB. Organizing Committee and Course Faculty, Chair, "Introduction to Spinal Surgery for Operating Room Nurses", Foothills Medical Centre, May 11, 2019

Lewkonja P. Lead, Orthopaedic Surgery Residency Program Spine Education, 2018 to present

Lewkonja P. Lead, Foothills Medical Centre Orthopaedic Spine Program, 2018 to present

Lewkonja P. Course II Director, Undergraduate Medical Education, University of Calgary, 2015 to present

Nicholls F. Organizing Committee and Course Faculty, Chair, "Introduction to Spinal Surgery for Operating Room Nurses", Foothills Medical Centre, May 11, 2019

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

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

Salo P. Faculty Research Director, Section of Orthopaedics, 2014 to present

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, Combined Orthopaedic/Neurosurgical Spine Program, Foothills Medical Centre

Salo P. Member, Research Committee, McCaig Institute for Bone and Joint Health, 1998 to present

Salo P. Member, Clinical Investigator Program Residency Training Committee, 2015 to present

Thomas K. Member, Surgical Executive Committee, Calgary Zone, 2013 to present

Thomas K. Cumming School of Medicine Admissions, File Review Committee, Nov/Dec 2017; Nov/Dec 2018

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

Provincial

Jacobs WB. Provincial Neurosurgery Representative to Alberta Medical Association, 2017 – present

Lewkonja P. Clinical Systems Design Clinical Lead, Connect Care (Orthopaedics), Alberta Health Services, 2018 present

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

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

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

Thomas K. President, Alberta Spine Foundation. 2018 to 2020

National

Bouchard J. Royal College of Physicians and Surgeons of Canada: Program survey team

Bouchard J. Royal College of Physicians and Surgeons of Canada: Vice-chair, Orthopaedic Surgery Specialty Committee, June 2016 to present

Bouchard J. Royal College of Physicians and Surgeons of Canada: Surgical Foundations Advisory Committee collaborator

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

Casha S. Rick Hansen Institute Cure Program Advisory Committee member. October 2013 to present

Ferri-de-Barros F. Canadian Pediatric Spine Society, President, 2019 to present

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

Thomas K. Data Quality and Cleaning Task Force, Canadian Spine Research Outcomes Network. 2018/19

Thomas K. Examiner, Royal College Physicians and Surgeons - Orthopaedic Surgery. 2018, 2019

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

Thomas K. Canadian Spine Society Executive Committee Board, Member. 2013 to present

International

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

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

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-present

Jacobs WB. AOSpine North America Nominating Committee, Member, 2019 – present

Jacobs WB. Scientific Program Committee, Member, 2020 Annual Meeting of the AANS/CNS Section of Disorders of the Spine and Peripheral Nerves

Jacobs WB. AOSpine International Diploma Curriculum Committee, Member, 2018 – present

Jacobs WB. Research & Awards Committee, AANS/CNS Section of Disorders of the Spine and Peripheral Nerves, Member, 2018 – present

Jacobs WB. AOSpine North America Curriculum Planning Committee, Member, 2017 – present

Jacobs WB. Chair, Rules and Regulations Committee, AANS/CNS Section of Disorders of the Spine and Peripheral Nerves, 2015 – 2018.

Jacobs WB. Member, Executive Committee, AANS/CNS Section of Disorders of the Spine and Peripheral Nerves, 2015 – present.

Jacobs WB. Member, AOSpine North America Education Committee, 2015 – 2018.

Lewkonja P. AO Spine North American Faculty, 2018 to present

Nicholls F. Global Spine Congress, Program Committee, 2019



Canadian Spine Society

In 2019, the Canadian Spine Society (CSS) meeting was held in Eastern Canada. Many members of our program, representing both neurosurgery and orthopedic surgery, attended the annual meeting at the Fairmont Royal York in Toronto.



In addition to consultant presentations, our Residents and Fellows presented the following:

- Aldebeyan S, Sridharan S, Aoude A, Rawall S, Cho R, Thomas T, Swamy G. Factors influencing the restoration of lumbar lordosis in adult degenerative scoliosis treated with lateral transposas interbody fusion. From the University of Calgary, Calgary, Canada; and the King Fahad Medical City, Riyadh, Saudi Arabia. Poster presentation.
- Aoude A, Aldebeyan S, Ben Israel D, Beland B, Casha S. A Canadian Experience with Halo Vest Treatment for Cervical Spine Trauma, Risk Factors and Complications. Poster presentation.
- Aoude A, Litowski M, Aldebeyan S, Rampersaud R, McIntosh G, Fisher C, Soroceanu A, Thomas K. Spine surgery outcomes: a comparison of patient versus surgeon expectations from a Canadian perspective. Podium presentation.
- Cushnie D, Thomas K. The association between improvements in mental health with pain and disability improvements after thoracolumbar spine surgery: a Canadian Spine Outcomes and Research Network study. Podium presentation.
- Rogers S, Jacobs WB, Bouchard J, Casha S, Cho R, Du Plessis S, Hurlbert RJ, Lewkonja P, Salo P, Soroceanu A, Swamy G, Thomas KC, Nicholls F, Dea N, Forkert N, Mouches P, Cadotte D: Machine Learning to Predict a Single Patient Clinical Course: How Will Your Life Change After a Diagnosis of Degenerative Cervical Myelopathy? Poster presentation.
- Yang MMH, Yavin D, Dhaliwal P, Lang S, Jacobs WB, Casha S, Du Plessis S: Preoperative Disability Predicts Prolonged Hospital Stay Following Elective Lumbar Fusion Surgery. Podium presentation.





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 and academic collaboration.

The ASF is committed to appropriate high-quality spine care through the development of innovative patient care and referral modes.

- Through our six fellowship positions, we offer newly qualified orthopedic surgeons and neurosurgeons, the opportunity to develop advanced management of complex spine disorders.
- The ASF is actively involved in research through its members. The ASF financially supports clinical and basic science research. The ASF supports research where multiple care providers collaborate.
- The ASF went through its fourth annual peer-reviewed grant funding competition and awarded \$135 000 to four projects as follows:
 - Evaluating the Effects of Six-Week of Lumbar Bracing on Type I Modic Changes: A Pilot Randomized Control Trial
 - Kawchuk et al \$20 000
 - Can automated imaging analysis of multi-modality spinal imaging be more reliable than human assessors in the CSORN degenerative spondylolisthesis investigation?
 - Swamy et al \$20 000
 - The regenerative potential of epidural fat stem cells: An in vivo study to determine how these cells respond to injury
 - Krawetz et al. \$20 000
 - The effects of Botox-induced paraspinal muscle weakness on the structure and mechanics of the rabbit spine
 - Herzog et al \$75 000

This year the 6th Annual ASF annual meeting was held in Red Deer in September, under the direction of the Chairman, Dr. Ken Thomas.

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 more than 11,000 enrolments with 1,905 added in 2019. The Network contains a variety of spine diagnoses and surgical procedures and reflects a predominantly stenotic cohort of patients. There were 191 enrollments added to the prospective studies in 2019. From baseline to 3-month follow up, pain ratings improved and overall patient satisfaction with spine surgery was high. There have been 6 studies published in peer-review medical journals this year, bringing the overall total to 12. CSORN research initiatives including abstracts and presentations at scientific conferences were abundant once again in 2019.



Our site enrolled 525 patients into CSORN over the last year with 12 surgeons enrolling consecutive patients. Some are enrolling all eligible surgical patients and others for specific diagnoses only (i.e. CSM). Last year, 72% of our CSORN patients were enrolled from Caleo Health, a multi-disciplinary clinic in the Northwest. 28% 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 94%
- 1 year follow-up 92%
- 2 year follow-up 90%

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

- Quantifying chronic opioid use in adult spine deformity patients
Dr. Alex Soroceanu
- The impact of admission unit on peri-operative complications after elective spine surgery
Dr. Alex Soroceanu
- Midterm outcomes of anterior lumbar disc replacement: a comparison between stand-alone disc replacement and hybrid anterior fusion and disc replacement
Dr. Jacques Bouchard

In 2020 we anticipate the initiation of Dr. David Cadotte's prospective studies for Mild Degenerative Cervical Myelopathy, in collaboration with CSORN.



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. Six hundred seventy 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 multisite sub-study collaborations within the registry, recruiting patients specifically to these initiatives and collecting additional data for those research questions. Currently, those sub-studies include: Gastrointestinal and Urinary tract Microbiome after Spinal Cord Injury, Acceptance and empowerment after Spinal Cord Injury, and Liberation from Mechanical Ventilation. 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, the Mean Arterial Blood Pressure in Acute Spinal Cord Injury trial, the creation of a cerebrospinal fluid and serum tissue bank for the study of biomarkers, and a collaboration with SCI Alberta for the collection of community follow-up outcomes. Current new activities in this initiative include the adoption of the revised data set that will shortly be adopted across the 35 RHSCIR sites and transfer of sponsorship for the MASC to the University of Calgary investigators.

International Spine Study Group (ISSG)

Since 2017, Calgary has contributed 26 patients to the ISSG database. This database focuses entirely on the surgical treatment and outcomes of adult spinal deformity. It collects very detailed surgical information, patient histories and quality of life outcomes along with full spine x-ray imaging at every follow-up point. In 2019 the ISSG committee decided to re-assess their research initiatives and closed enrollment to their first version of their database. In the meantime, they have re-structured the data points that will be collected and will open enrollment to their new version of this database sometime in early 2020. Dr. Swamy, Dr. Thomas, Dr. Nicholls and Dr. Soroceanu contributed to the original 26 patients and will continue to follow these patients until their 5-year follow-up. So far, Calgary's deformity follow-up rates have been very successful, with about half the patients already completing their 2-year follow up and with only one patient being lost to follow-up when she moved out of province. Moving forward, only Dr. Soroceanu will be contributing her patients to the new ISSG database, while the rest of the deformity team will be focusing on new initiatives for the Canadian-based deformity registry as part of the CSORN registry.

Innovations

Dr. David Cadotte Delivering Personalized Medicine

Dr. Cadotte has been a faculty member in Calgary for only two years, but he's become an ardent champion of the Calgary Spine Program and all that it has to offer patients. The program is Canada's largest spine group operating in one hospital. And the size of the team—17 surgeons from orthopedic surgery and neurosurgery—has huge advantages.

"When you have a big group like this, it changes the way you practice," he says. "You work in a more subspecialized setting, which allows for better research and better patient care ultimately."

The neurosurgeons in the group, for example, have recently started a myelopathy clinic on the 12th floor of Foothills Hospital. Our orthopaedic colleagues are running a sciatica clinic examining the role of serum biomarkers.

"They're trying to discover who's going to get better in a short time period, and who might need surgery." Dr. Cadotte says his PhD work in medical imaging is allowing him to use sophisticated techniques when making clinical decisions and then delivering personalized medicine to his patients. It's an approach, he says, that puts Calgary at the forefront of spine surgery in Canada.

"We have within our means to become the first major spine center in the country that delivers personalized medicine."

It's a bold vision, but it's achievable, he says. "All of the elements are in place with the spine group in Calgary to achieve this."

*From Department of Clinical Neurosciences Newsletter



Transitional Outpatient Pain Program for Spine (TOPPS)

The Transitional Outpatient Pain Program for Surgery (TOPPS) interdisciplinary program is based at Caleo Health and involves surgeons, addiction medicine specialists, psychiatrists, nurse practitioners, psychologists, pain physicians, physiotherapists, and kinesiologists.

The Adult Spinal Deformity group refers the majority of their patients to Dr. Rob Tanguay and the TOPPS program. The program is started prior to elective surgery and has two parts:



Dr. Robert L. Tanguay

Part 1: Pre-operative phase

This program is 12 weeks in duration, and includes 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

Part 2: Post-operative phase

Patients are followed in the post-operative period by members of the TOPPS program to ensure their analgesic needs are met before transitioning to their primary care physician. The TOPPS program assumes all opioid prescriptions from the time of discharge from the hospital to 12 weeks postoperatively for opioid discontinuation. Post-operative physiotherapy is also initiated. Psychiatric co-morbidities are assessed and treated. Pain is assessed and treated. Once the patient has been tapered off all opioids, or to the lowest effective dose, the patient is then transferred back to primary care with access to telephone consultation services for the primary care physician to ensure a smooth transition in care.

In 2019, the TOPPS team held information sessions with the Surgeon's offices and their Administrative Assistants, to raise awareness and encourage referral of any elective surgical patient.

Who can be referred to TOPPS?

- Any patient can be referred and will be triaged based on their baseline questionnaire
- Refer early - a minimum of 3 months before surgery if possible
- Post-op patients can be referred and will be triaged by the TOPPS team

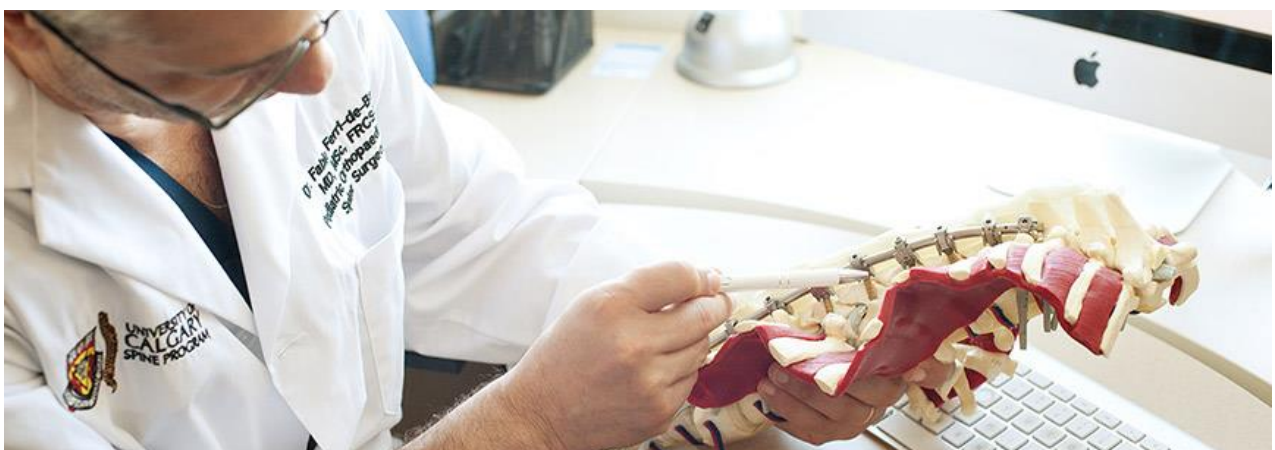


New Staff

Lasantha Gunasekara PhD

Research Associate
Department of Pediatric Orthopaedic Surgery
Alberta Children's Hospital (ACH)

Lasantha joined the Spine Program at ACH in February of 2019. He finished his Ph.D. in Cardiovascular and Respiratory Physiology and at the University of Calgary in 2008. He's currently working with Dr. Ferri-de-Barros on a simulation study: "Navigated Sequential Drilling for Pedicle Screw Instrumentation in Scoliosis Surgery".



Social Events



The ASF Holiday gathering took place December 1, 2018 at Foreign Concept.

A Spring celebration for the graduation of our spine fellows was held June 15, 2019 at Alloy. We wish Dr. Ahmed Aoude, Dr. Sultan Aldebeyan, Dr. Sasha Rogers and Dr. Kedar Padhye all the best as they embark on careers in spinal surgery.



