The Canadian Spine Society is a collaborative organization of spine surgeons and health care professionals from across Canada with a primary interest in advancing excellence in spine patient care, research & education.

Canadian Spine Outcomes and Research Network (CSORN):

2022 Annual Report

The Canadian Spine Research & Education Fund (CSREF) is a charitable organization whose mandate is to promote spine research and education in Canada.

Canadian Spine Outcomes and Research Network (CSORN): 2022 Annual Report

On behalf of the Steering Committee and all the investigators and research coordinators who contribute to the success of the Canadian Spine Outcomes and Research Network (CSORN), I present the 2022 Annual Report.

The CSORN initiative continues to provide a national record of the indications, techniques, complications and outcomes of spine surgery across Canada. It is a vehicle to improve spine surgery.

Four key groups contribute to CSORN's success: patients, surgeons, research coordinators and funders. Patients remain willing to answer numerous questions at multiple time points during their treatment. Completing lengthy surgical forms at the end of a long day in the operating room is not pleasant but our spine surgeons (principal and co-investigators) remain committed. Their ability to develop research questions and perform studies is truly outstanding. Our research coordinators remain the backbone (pun intended) of the CSORN initiative. They have the unenviable job of tracking down both surgeons and patients to ensure all the forms are complete and accurate. Our coordinators are tireless – often working outside normal business hours – in data collection/entry, phone calls and mailings.

A successful registry requires financial support. We are fortunate to have generous sponsorship, through the Canadian Spine Research & Education Fund, from our principal funders, Medtronic and DePuy Synthes. There would be no CSORN without their annual contributions.

One of many milestones reached in 2022 was reaching 54 overall in-print/in-press publications. Many healthcare registries have successfully collected data but failed in knowledge transfer. Summarizing pages of results and analyses into a manuscript, then making the journal submission are arduous tasks. Congratulations to our resolute authors for carrying their research ideas to publication and making significant contributions to the medical literature.

Another important 2022 milestone is the succession of Raja Rampersaud to the CSORN Chair. After holding the position since the registry's inception, Dr Charles Fisher has moved from Chair to the CSORN Advisory Board.

Despite the aftermath of the pandemic, CSORN continued to grow in volume, data quality and research output. This Annual Report summarizes accomplishments of the CSORN investigators and offers a variety of key data points for the 1,188 patients enrolled in 2022.

Greg McIntosh
CSORN Director of Research Operations
December 31, 2022

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Executive Summary

The Canadian Spine Outcomes and Research Network (CSORN) now contains 13,977 enrolled patients across 22 sites, with 1,188 added in 2022. Enrollments were down 24% over last year.

Our three continuing prospective studies added 177 patients. Our cervical spondylotic myelopathy study is now the largest single CSM dataset in the world.

The most common principal pathology was stenosis for both cervical and thoracolumbar (TL) patients. For both cervical and TL elective surgery cases, fusion (in combination with other operations) was the most common procedure.

From baseline to 3-month follow up, neck/arm pain ratings and disability scores improved for the cervical patients. Measured by pathology, those with degenerative disc disease had the largest reduction in neck pain (-3.6 points) and arm pain (-3.5 points). For the TL patients, those with deformity had the largest reduction in back pain (-4.7 points); those with spondylolisthesis had largest reduction in leg pain (-5.3). Cervical patients with degenerative disc disease had the greatest improvement in the Neck Disability Index (NDI) (-19.8); TL patients with disc herniation had the greatest improvement in disability score (-26.3 points).

Three months after surgery, 86% of cervical patients stated they were satisfied with their outcome. For thoracolumbar patients that number was 87%.

The CSORN website continues to see modest online traffic and can be accessed at: csorncss.ca

CSORN research initiatives, including abstracts and presentations at scientific conferences, were again prolific; 15 study abstracts were presented at the 2022 CSS Scientific Conference and 24 abstracts were submitted to the 2023 Conference.

There were 6 studies published in peer-review medical journals this year; 10 manuscripts have been accepted and are in-press. In total, we have produced 54 in-print/in-press publications.

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

• Implementation of more comprehensive data collection and reporting of spinal implant data, specific to certain funders

• Transition from the Global Research Platform (GRP) to registry technology that will improve data collection and reporting

• Initiation of a spine registry for paediatric patients

Introduction

The Canadian Spine Society (CSS) is a collaborative organization of spine surgeons and health care professionals from across Canada. The CSS mission is to advance excellence in spine patient care, research and education. To help further this mission, the CSS established the Canadian Spine Registry pilot study in 2012; this initiative progressed to a full-scale research project in 2015, becoming the Canadian Spine Outcomes and Research Network (CSORN).

CSORN Mission Statement

"We are Canadian spine surgeons and rehabilitation specialists with an interest in multi-centre research that evaluates operative techniques and their im-

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pact on patient outcomes in order to enhance quality of spine practice and patient care in Canada and demonstrate surgical leadership on a global scale."

Objectives

CSORN's objective is compiling a national registry of indications, techniques, complications and outcomes for spine surgery. Utilizing both prospective trials and retrospective studies, we publish our findings in peer-reviewed medical journals.

Patient Enrollment

Participating sites consecutively enrol all eligible patients with cervical, thoracic or lumbar, pathology requiring treatment. Patient enrollment in the CSORN registry does not change clinical management or require additional tests or procedures.

Inclusion / Exclusion Criteria

Eligibility for enrollment requires:

- Male or Female ≥ 18
- Spinal diagnosis with one or more of the following:
  - ⇨ Degenerative or arthritic conditions
  - ⇨ Trauma
  - ⇨ Deformity
  - ⇨ Oncology
  - ⇨ Infections
- Able to communicate in English or French and provide informed consent.

Patients who do not complete the Initial Patient Assessment or Consent form prior to surgery are excluded.

Informed Consent

Patients are given ample time to decide if they wish to be enrolled in the registry. Written, informed consent is obtained prior to any data collection. All informed consent processes and documentation follow both national regulations/guidelines and local institutional policies.

Data Collection Process

Following consent, patients provide baseline demographic information, medical history, employment status, previous medical treatment and current medication usage; they complete standardized health questionnaires on pain, function, disability and quality-of-life. Treating surgeons collect clinical assessment, principal pathology, radiographic evaluation and previous medical treatment information.

Follow Up

The first post-surgical visits and/or data collection time points are scheduled to coincide with standard clinical follow-up appointments at approximately 6-18 weeks. Further information is collected 1 year and 2 years post treatment. Depending on the procedure, some patients may be followed for up to ten years. Data collection focuses on complications related to clinical treatment, current health status, satisfaction with surgery, radiographic outcomes and the same standardized patient questionnaires administered at baseline.

Ethics Approval

The principal investigator at each CSORN site is responsible for submitting the CSORN protocol to their local Research Ethics Board (REB) for approval or annual renewal; no patient enrollments are

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performed until after this step is completed. Each local REB is informed whenever the CSORN Steering Committee makes any protocol amendments, in accordance with International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH) E6 Good Clinical Practices (GCP), local procedures and Canadian regulatory requirements.

Global Research Platform

CSORN uses the Global Research Platform (GRP) system, developed by the Praxis Spinal Cord Institute, for the collection and storage of all data. GRP is a user-friendly, web-based, secure data collection and research management structure that has been designed specifically for the collection of clinical and outcome information on spinal cord injury and spinal pathology. Praxis Spinal Cord Institute Praxis is a Canadian-based not-for-profit organization that leads global collaboration in spinal cord injury and spinal pathology research, innovation and care.

Privacy

Praxis adheres to a "gold standard" of data protection through compliance with Canadian legislative requirements, international data protection standards and privacy best practices. Praxis is subject to British Columbia's Freedom of Information and Protection of Privacy Act (FIPPA) for any data they receive from participating CSORN sites. As a privacy best practice, Praxis complies with the federal Personal Information and Protection of Electronic Documents Act (PIPEDA) and all provincial and territorial privacy laws for its' information handling practices. Praxis has implemented a national privacy and security framework for information handling practices by national CSORN staff that is independent from, but complimentary to, the existing local privacy infrastructure already in place at participating CSORN sites.

Data Security

GRP is hosted in a top-tier, secure data centre in Canada and meets global privacy and security requirements. The GRP database and servers are held at a secure location in the Toronto area. KPMG evaluated the security of the system and it passed all of their requirements. On two occasions, ethical hackers were hired to attempt to break into the system from outside and within using valid GRP credentials. They were unsuccessful and commented that they had never encountered such strong security. The database is encrypted so that only GRP can read its contents. Encrypted database back-ups are performed nightly to a secondary site. If the database crashes or there is data loss, only data entered on that day will be affected because back-ups are made on a nightly basis.

Funding

The Canadian Spine Education & Research Fund (CSREF), a registered charitable organization, provides financial support for CSORN. Donations to the Fund come from the public and members of the Canadian Spine Society as well as from the generous contributions of our industry sponsors: Medtronic and DePuy Synthes.

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2022 Milestones

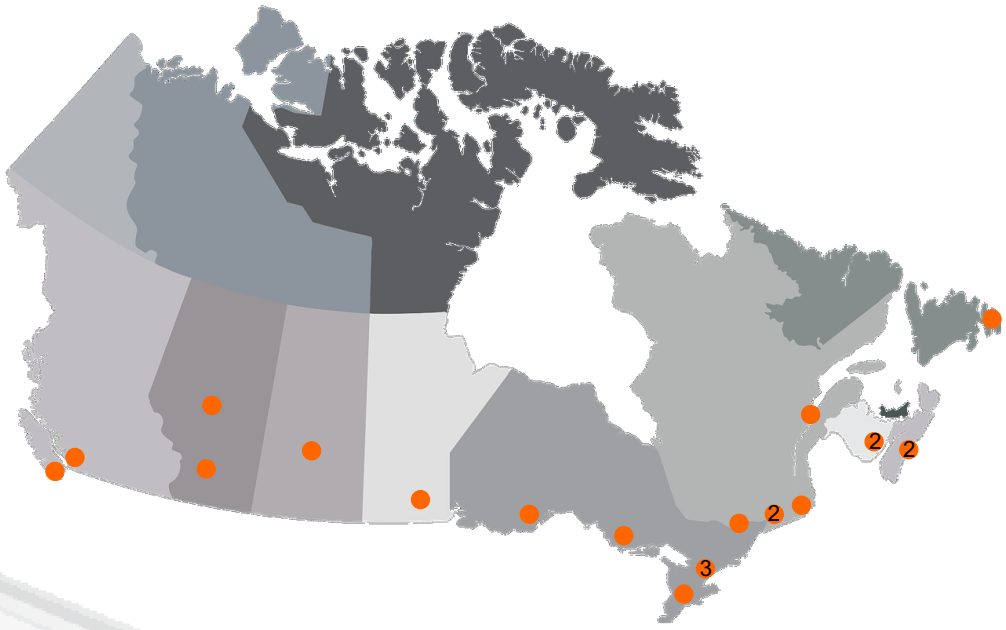
- 54 in-print / in-press publications — December
- 2nd manuscript published in *Neurosurgery* (*impact factor 4.8*) — November
- CSORN investigators return to in-person research conference — September

2022 CSORN Profile in Numbers

930 ThoracoLumbar patients enrolled	**258** Cervical patients enrolled	**507** Patients who had spine surgery
22 Sites/hospitals	**67** Participating surgeons	**82** Research coordinators
17 Abstract Presentations	**6** In-print Publications	**10** In-press Publications

CSORN Site Locations

The Network now spans nine provinces.



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Website

The CSORN website was launched in 2021 to help improve dissemination of results and provide comprehensive background information on the CSORN initiative. Please visit csorncss.ca for more details.

Numbers at a Glance

Patient Demographics

59.0 average age (standard deviation=13.9, range 19-86)

29.3 average Body Mass Index (standard deviation=7.0, range 11.4-122.0)

52% males

66% or more than high school education

21% nicotine users

77% greater than 2-year symptom duration

59% exercising regularly

82% >1 comorbidity

Surgical Statistics

3.1 days: average length of hospital stay (standard deviation = 5.9)

25% with previous spine surgery

2.4% with intra operative adverse event; 3.9% with a peri-op adverse event

0.5% with tumour related surgery

Registry numbers

18952 patients enrolled since inception (including pilot phase)

13977 patients enrolled since January 2015

1188 patients enrolled in 2022

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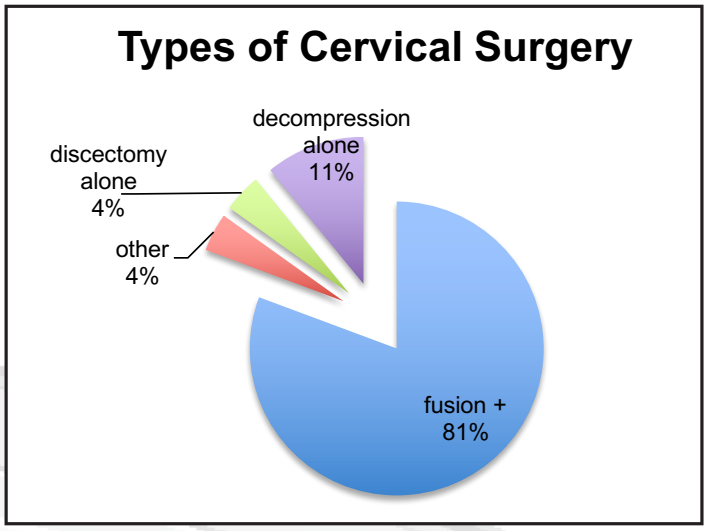
Enrollments by Year

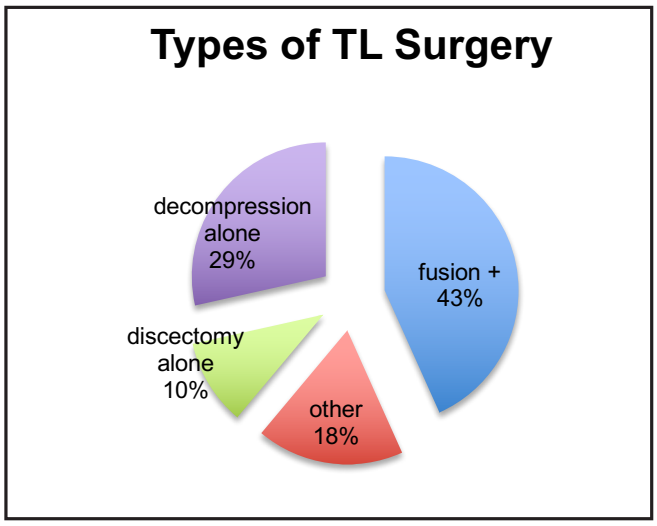
Enrollments decreased 24% compared to the previous year.

Surgical Data

Types of Surgery

For elective surgery cases, fusion (in combination with other operations) was the most frequently performed procedure in both the cervical and thoracolumbar spine.





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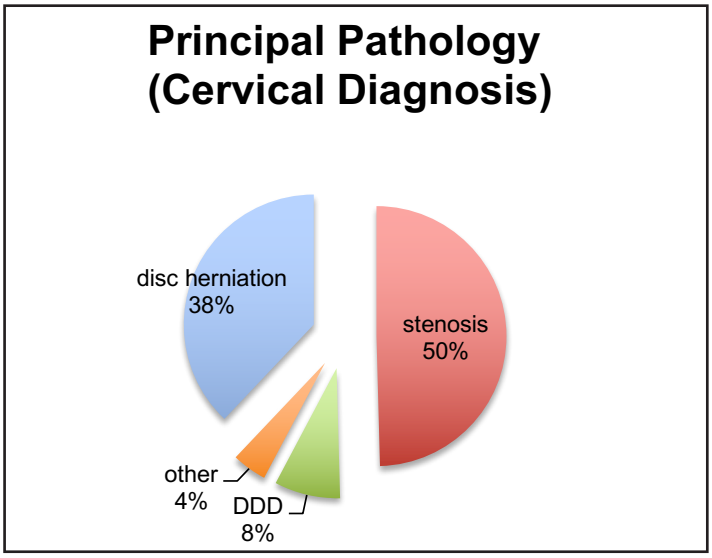
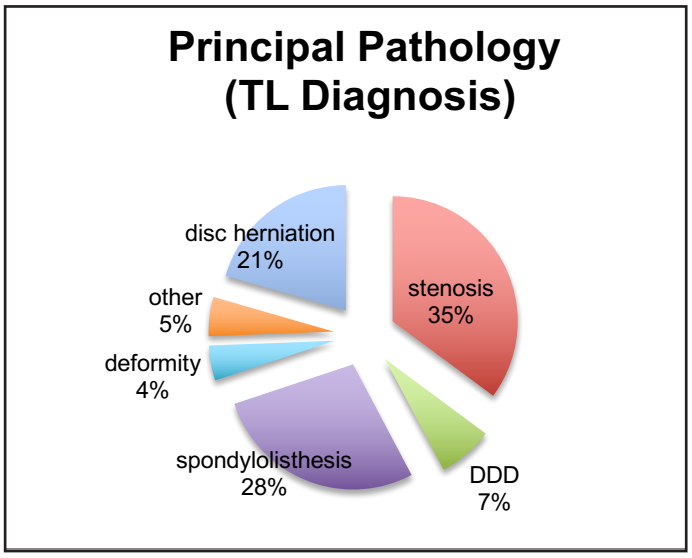
Principal Pathology

For cervical patients, the most common principal pathology was disc herniation; for thoracolumbar (TL) patients, the most common was stenosis.

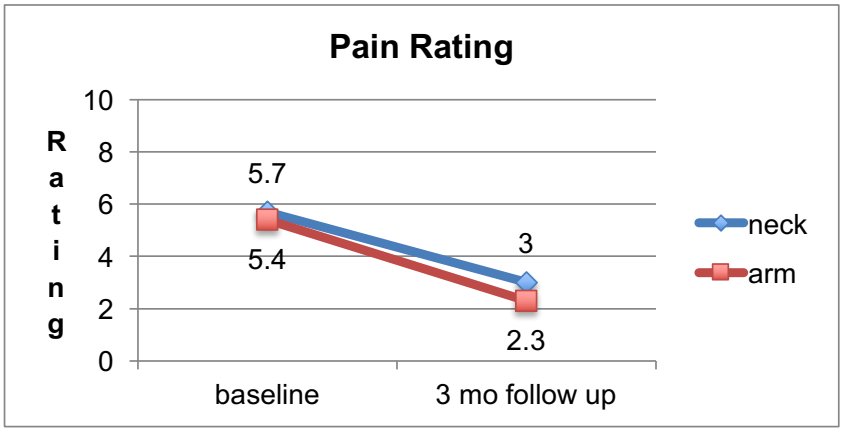




Selected Patient Reported Outcomes

Numeric Pain Rating

Overall mean improvements in cervical pain rating were 2.7 points for neck pain and 3.1 points for arm pain at 3 month follow up. By pathology, those with degenerative disc disease (DDD) had the largest reduction in neck pain (-3.6) and arm pain (-3.5).



	Deformity	DDD	Disc Herniation	Spondy	Stenosis
Neck pain change	-	-3.6	-2.0	-	-2.7
Arm pain change	-	-3.5	-2.4	-	-3.4

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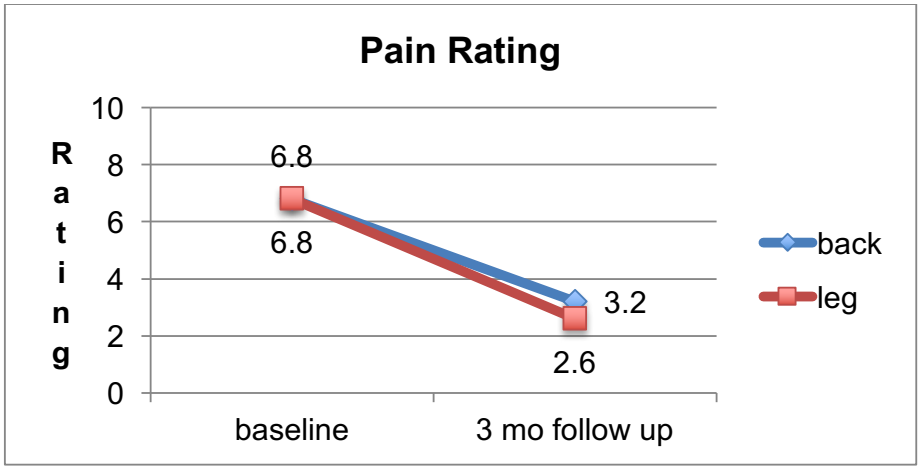
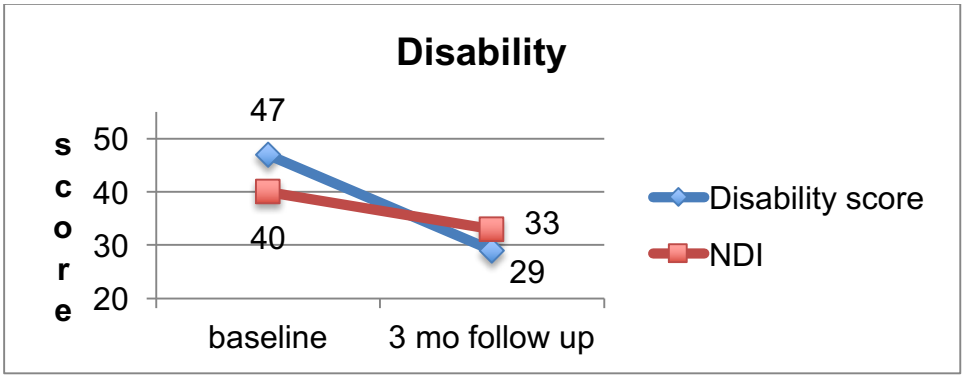
Overall mean improvements in thoracolumbar pain rating were 3.6 points for back pain and 4.2 points for leg pain at 3 month follow up. By pathology, those with deformity had the largest reduction in back pain (-4.7); those with spondylolisthesis had largest reduction in leg pain (-5.3).



	Deformity	DDD	Disc Herniation	Spondy	Stenosis
Back pain change	-4.7	-3.7	-3.4	-4.0	-3.6
Leg pain change	-4.1	-3.0	-3.9	-5.3	-4.2

Disability Questionnaires

Measured by standard disability questionnaires, at 3 month follow up, overall mean improvements were 13 points for cervical patients and 18 points for thoracolumbar. By pathology, those with disc herniation had largest improvement in NDI (-19.8) and disability score (-26.3).



	Deformity	DDD	Disc Herniation	Spondy	Stenosis
Disability Score change	-17.8	-23.0	-26.3	-21.4	-19.8
Neck Disability change	-	-19.8	-9.1	-	-13.6

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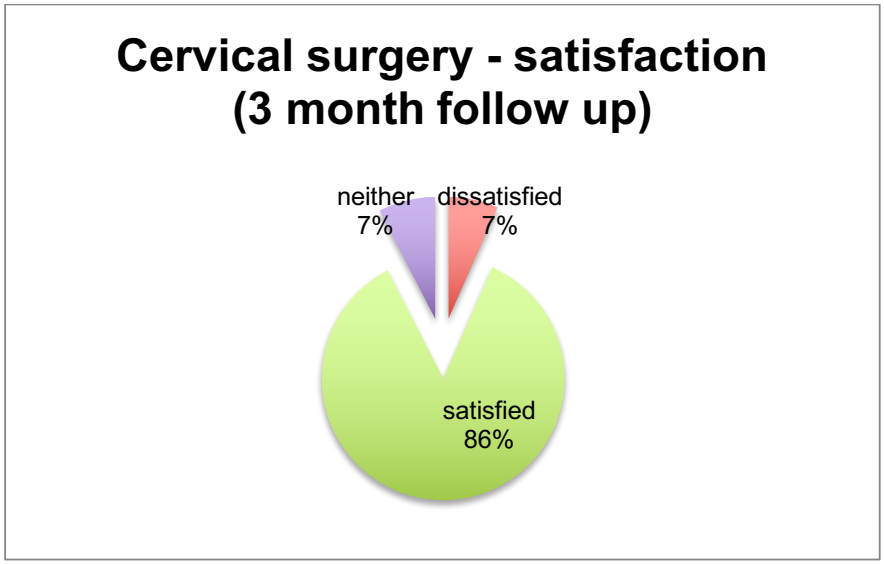
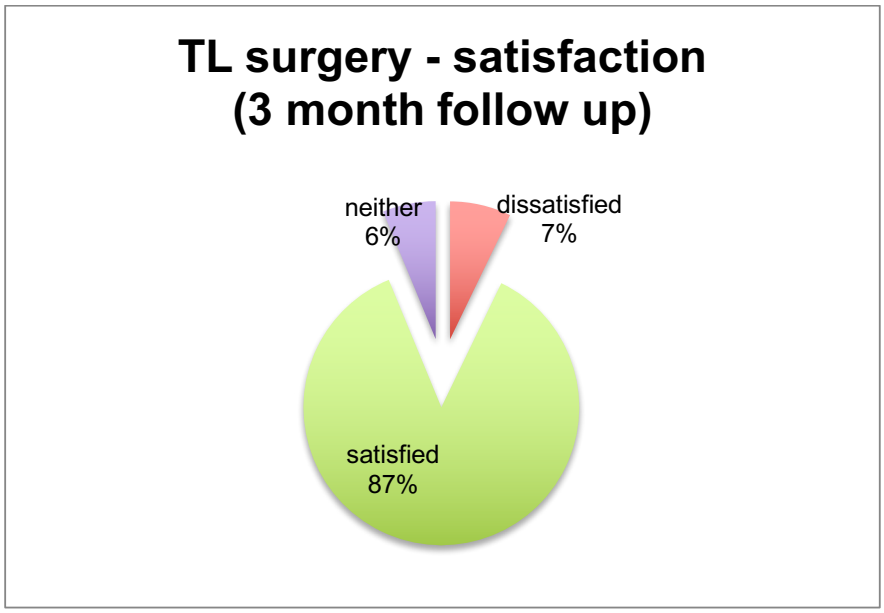
Patient Satisfaction

Approximately 86% stated that they were satisfied three months after cervical surgery; 87% stated that they were satisfied three months after thoracolumbar surgery.



	Deformity	DDD	Disc Herniation	Spondy	Stenosis
Dissatisfied (%)	-	0	7	-	7
Satisfied (%)	-	100	79	-	91
Neither (%)	-	0	14	-	2



	Deformity	DDD	Disc Herniation	Spondy	Stenosis
Dissatisfied (%)	7	11	8	5	9
Satisfied (%)	86	83	87	88	85
Neither (%)	7	6	5	7	6

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Research Activities

Prospective Studies
Ongoing in 2022:

Surgical treatment of degenerative spondylolisthesis: a standardized clinical assessment and management plan: CSS multicenter prospective cohort study (39 patients enrolled in 2022; total n=710)

Management and outcome of cervical spondylotic myelopathy: a standardized clinical assessment and management plan (107 patients enrolled in 2022; total n=1009)

Decompression alone vs. decompression and instrumented fusion for the management of lumbar spinal stenosis associated with stable degenerative spondylolisthesis: a pragmatic randomized clinical pilot trial (enrollment closed in 2022; total n=61)

Surgical treatment of adult spinal deformity (31 patients enrolled in 2022; total n=195)

Retrospective Studies
Retrospective studies initiated and abstracts written in 2022:

1. The unsustainable growth of out-of-hours emergent surgery for degenerative spinal disease in Canada: a retrospective cohort study from a national registry.

2. Timing of recovery after surgery for patients with Degenerative Cervical Myelopathy: An observational study from the Canadian Spine Outcomes and Research Network.

3. Deterioration after surgery for Degenerative Cervical Myelopathy: An observational study from the Canadian Spine Outcomes and Research Network.

4. Wait Times for Degenerative Lumbar Spine consultation and surgery: A repeated cross-sectional analysis of the Canadian Spine Outcomes and Research Network.

5. A Cost Consequence Analysis Comparing Spinal Fusion versus Decompression Alone for Lumbar Degenerative Spondylolisthesis.

6. Predictors of dynamic instability in the decision to fuse in degenerative lumbar spondylolisthesis: Results from the CSORN prospective LDS study.

7. Decompression and decompression and fusion and the influence of spinopelvic alignment in the outcome of patients with degenerative lumbar spondylolisthesis (DLS).

8. Laminectomy Alone for Cervical Spondylotic Myelopathy: a CSORN Study.

9. The influence of wait time on surgical outcomes in elective lumbar degenerative surgery: A CSORN study.

10. Assessment of changes in opioid utilization one year after elective spine surgery. A Canadian Spine Outcomes and Research Network Study.

11. National adverse event rates following cervical spine surgery for degenerative disorders, and impact on patient satisfaction.

12. Gender differences in fusion rates in the treatment of degenerative lumbar spondylolisthesis: Analysis from the CSORN prospective LDS study.

13. Occiput and upper cervical fusions, does navigation matter? A CSORN study.

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14. Sex, Drugs and Spine Surgery: A Nationwide Analysis of Opioid Utilization and Patient Reported Outcomes in Males and Females.

15. The influence of Pre-operative Back Pain on patient rated outcomes following decompression with/without fusion for degenerative lumbar spondylolisthesis: Results from the CSORN prospective LDS study.

16. Predictors of poor postoperative patient satisfaction in elective spine patients with pre-existing compensation claims.

17. Opioid-use in Low Back Pain is Associated with Decreased Quality of Life, Increased Disability and Worse Treatment Outcomes: A Stratified Propensity-Score Analysis.

Presentations
National presentations made in 2022:

1. Exploring the Relationship between Cannabis and Narcotic Use on Pre-Operative Health Considerations in Canadian Thoracolumbar Patients: A CSORN Study.

2. Surgical Management and Outcomes from "Stable" Degenerative Spondylolisthesis (DS) from the CSORN prospective DS study: What the @#$% are we doing?

3. Economic consequences of waiting for lumbar disc herniation surgery.

4. Outcomes following revision decompression for lumbar spinal stenosis when compared to primary decompression: a matched cohort analysis using the CSORN registry.

5. Development of a Frailty Index from CSORN to Predict Long Term Success of Surgery for Patients with Degenerative Pathologies of the Spine.

6. Posterolateral versus posterior interbody fusion for the management of lumbar degenerative spondylolisthesis: Analysis from the CSORN prospective LDS propensity score matched study.

7. Impact on patient reported outcomes of ending the posterior construct proximally at C2 vs C3 in degenerative cervical myelopathy patients.

8. Perioperative factors predict two year trajectories of pain and disability following anterior cervical discectomy and fusion.

9. Outpatient Spinal Surgery in Manitoba.

10. Propensity-Matched Outcomes Comparing Lumbar Interbody Fusion and Total Disk Arthroplasty: A CSORN Study.

11. Comparing patient preoperative expectations and postoperative expectation fulfilment between Minimally Invasive vs. Open Fusion surgery.

12. Patient, surgical, and institutional factors associated with length of stay in degenerative lumbar spine surgery: National Multicenter Cohort Analysis from CSORN.

13. Patient's expectations of surgery for degenerative spondylolisthesis: analysis by site and type of surgery from CSORN.

14. The Impact of Sex on Thoracolumbar Surgery Outcomes in Patients with Diabetes - A CSORN Study.

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15. Minimally Invasive vs Open Thoracolumbar Spine Surgery for Patients who have Lumbar Spinal Stenosis and an ASA score of 3+: A CSORN Study.

16. Association between surgeon age and outcomes of spine surgery: a population based retrospective cohort study.

17. Assessing the importance of radiographic and clinical parameters when choosing decompression without fusion for LDS: Results from the CSORN prospective DS study.

18. Pre-operative cannabis use in Canadian thoracolumbar spine surgery patients: A CSORN study.

19. Benefit of minimally invasive lumbar interbody fusion vs traditional interbody fusion vs posterolateral spinal fusion in lumbar degenerative spondylolisthesis: A propensity-matched analysis from the CSORN prospective LDS study.

20. The psychometric properties of the mJOA for quality-of-life assessments in cervical myelopathy.

21. Preoperative disc angle is an important predictor of segmental lordosis after degenerative spondylolisthesis fusion.

22. Preoperative depression, functional and radiographic outcomes after surgery for degenerative lumbar spondylolisthesis.

23. A CSORN study of functional outcomes after surgery for lumbar degenerative spondylolisthesis.

24. A CSORN study of the effect on radiographic alignment outcomes with different surgery type for degenerative lumbar spondylolisthesis

Publications

All CSORN published studies (in press/in-print) up to the end of 2022:

1. Tripp DA et al. Biopsychosocial factors predict quality of life in thoracolumbar spine surgery. Quality of Life Research Journal 2017; 26(11): 3099-3110.

2. Morcos MW et al. Predictors of blood transfusion in posterior lumbar spinal fusion. Spine 2018; 43(1): E35-39.

3. Ayling O et al. Clinical outcomes research in spine surgery: What are appropriate follow-up times? Journal of Neurosurgery: Spine 2019; 30(3): 397-404.

4. Eastwood D et al. Improving post-operative patient reported benefits and satisfaction following spinal fusion with a single pre-operative education session. The Spine Journal 2019; 19(5): 840-45.

5. Morcos MW et al. Predictive factors for discharge destination following posterior lumbar spinal fusion. Global Spine Journal. 2019; 9 (4): 403-08.

6. Ailon T et al. Patient reported outcomes following surgery for degenerative spondylolisthesis: Comparison of a universal and multi-tier health care system. The Spine Journal 2019; 19(1):24-33.

7. Srinivas S et al. Effect of spinal decompression on back pain in lumbar spinal stenosis. The Spine Journal 2019; 19(6):1001-08.

8. Thomas K et al. Decompression alone vs. decompression plus fusion for claudication secondary to lumbar spinal stenosis. The Spine Journal 2019; 19(10):1633-39.

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9. Sharifi B et al. Consultation and surgical wait times in cervical spondylotic myelopathy. Canadian Journal of Neurological Science 2019; 46(4):430-35.

10. Cushnie D et al. Effect of preoperative symptom duration on outcome in lumbar spinal stenosis. The Spine Journal 2019; 19(9):1470-77.

11. Hebert J et al. Patients undergoing surgery for lumbar spinal stenosis experience unique courses of pain and disability: a group-based trajectory analysis. PLoS ONE [Electronic Resource]. 14(11):e0224200, 2019.

12. Bond M et al. Treatment of mild cervical myelopathy: Factors associated with decision for surgical intervention. Spine 2019; 44(22):1606-12.

13. Canizares M et al. Patients' expectations of spine surgery for degenerative conditions. The Spine Journal 2020; 20(3):399-408.

14. Stratton A et al. Opioid use trends in patients undergoing elective thoracic and lumbar spine surgery. Canadian Journal of Surgery 2020; 63(3):E306-12.

15. Evaniew N et al. Clinical predictors of achieving the minimal clinically important difference after surgery for cervical spondylotic myelopathy: An external validation study. Journal of Neurosurgery: Spine 2020; 33(2): 129-37.

16. Hebert JJ et al. Preoperative factors predict postoperative trajectories of pain and disability following surgery for degenerative lumbar spinal stenosis. Spine 2020; 45(21): E1421-30.

17. McIntosh G et al. Development and implementation of a national Canadian spine surgery registry. Journal of Current Clinical Care 2020; 10(2): 21-31.

18. Bond M et al. Back pain in surgically treated degenerative lumbar spondylolisthesis: What can we tell our patients? The Spine Journal 2020; 20(12): 1940-47.

19. Yang MMH et al. Development and validation of a clinical prediction score for poor postoperative pain control following elective spine surgery. Journal of Neurosurgery: Spine 2020; 1-10.

20. Ayling OGS et al. The effect of peri-operative adverse events on long-term patient reported outcomes after lumbar spine surgery. Neurosurgery 2021; 88(2): 420-27.

21. Chan V et al. Comparison of clinical outcomes between posterior instrumented fusion with and without interbody fusion for isthmic spondylolisthesis. Clinical Spine Surgery: A Spine Publication 2021; 34(1): E13-18.

22. Aoude A et al. A comparison of patient and surgeon expectations of spine surgical outcomes. Global Spine Journal 2021; 11(3): 331-37.

23. Romagna A et al. Factors associated with return to work after surgery for degenerative cervical spondylotic myelopathy: Cohort analysis from CSORN. Global Spine Journal 2022; 12(4): 573-78.

24. Schneider N et al. Lumbar degenerative spondylolisthesis: Factors associated with the decision to fuse. The Spine Journal 2021; 21(5): 821-28.

25. Glennie RA et al. The impact of pathoanatomical diagnosis on patients' expectations undergoing

elective spine surgery. Journal of Neurosurgery: Spine 2021; 35(1): 34-41.

26. Alnaghmoosh A et al. Back dominant pain has equal outcomes to radicular dominant pain following posterior lumbar fusion in adult isthmic spondylolisthesis: A CSORN study. Global Spine Journal 2021.

27. Evaniew N et al. Lumbar fusion surgery for patients with back pain and degenerative disc disease: An observational study from CSORN. Global Spine Journal 2021.

28. Singh S et al. Time to return to work after elective lumbar spine surgery. Journal of Neurosurgery: Spine 2022; 36(2): 168-176.

29. Iorio-Morin C et al. Low back pain after lumbar discectomy for disc herniation: What can you tell your patient? Journal of Neurosurgery: Spine 2021; 35(6): 715-721.

30. Ayling OAS et al. National AE profile for lumbar degenerative disease and complication rates between hospitals. Journal of Neurosurgery: Spine 2021; 35(6): 698-703.

31. Cushnie D et al. Mental health improvements after elective spine surgery. The Spine Journal 2021; 21(8): 1332-39.

32. Inculet C et al.. Factors associated with using an interbody fusion in low grade lumbar degenerative versus isthmic spondylolisthesis: a retrospective cohort study. Journal of Neurosurgery: Spine 2021; 35(3): 299-307.

33. Glennie RA et al. Variation in surgical treatment of degenerative spondylolisthesis in Canada: Surgeon assessment of stability and impact In treatment. European Spine Journal 2021; 30(12): 3709-19.

34. Karim SM et al. Effectiveness of Surgical Decompression in Patients With Degenerative Cervical Myelopathy: Results of the Canadian Prospective Multicenter Study. Neurosurgery 2021; 89(5): 844–51.

35. Charalampidis A et al. Differentiation of pain related functional limitations in surgical patients with Lumbar Spinal Stenosis (LSS) using the ODI: a CSORN study. The Spine Journal 2021; 22(4): 578-86.

36. Ayling O et al. Patient Reported Outcomes Following Surgery for Lumbar Disc Herniation: Comparison of a Universal and Multitier Health Care System. Global Spine Journal 2021.

37. Hathi K et al. Minimally Invasive vs Open Thoracolumbar Surgery for Lumbar Spinal Stenosis in Patients with Diabetes. Global Spine Journal 2021.

38. Evaniew N et al. Minimally Invasive Tubular Lumbar Discectomy Versus Conventional Open Lumbar Discectomy: An Observational Study From CSORN. Global Spine Journal 2021.

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Future Endeavours

The Steering Committee and select investigator working groups have definitive goals for the next 12-18 months:

- Release of a streamlined, more user-friendly surgical procedure form that will improve completion rates and data querying for investigators

- Implementation of more comprehensive data collection and reporting of spinal implant data, specific to certain funders

- Release of Version 3 of the patient data collection

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forms, representing further refinement and simplification of the process

• Transition from the Global Research Platform (GRP) to registry technology that will improve data collection and reporting

• Initiation of a prospective study of paediatric patients

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The Canadian Spine Research & Education Fund (CSREF) has accepted the essential role of funding the **Canadian Spine Outcomes and Research Network (CSORN).** To honour this commitment we require help from those most intimately involved with the provision of spinal treatment. Please plan to make a personal annual donation and consider canvassing your patients and colleagues to join your charitable efforts. Promotional materials; patient solicitation letters and brochures are available through the CSREF office; contact us and order yours today!

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