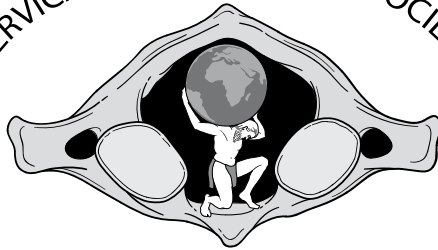


47TH

FORTY-SEVENTH ANNUAL MEETING

OF THE

CERVICAL SPINE RESEARCH SOCIETY



FOUNDED 1973

November 21 – 23, 2019

**The Marriott Marquis
New York City, NY**

Alexander Vaccaro, MD, PhD, MBA, *President*

Gregory D. Schroeder, MD and Justin Smith, MD, *Scientific Program Co-Chairs*

Scientific Meeting Objectives

- Present the results of current cervical spine research data.
- Promote discussion of new developments and techniques.
- Foster research concerning the diagnosis and treatment of cervical spine injury and disease.

7:00 am - 7:10 am	Welcome and Announcements <i>Moderators: Gregory D Schroeder, MD and Justin S Smith, MD, PhD</i>
7:11 am - 7:51 am	Session I: Outcomes I, Cervical Myelopathy <i>Moderators: Kazuhiro Chiba, MD, Michael Fehlings, MD, PhD and Jefferson Wilson, MD</i>
7:11 am - 7:16 am	Presentation #1 The Impact Of Older Age On Functional Recovery After Surgical Decompression For Degenerative Cervical Myelopathy: Results From An International, Multicentre, Prospective Dataset In 757 Patients <i>Jamie R F Wilson, MD; Jetan Hari Badhiwala, MD; Fan Jiang, FRCSC, MD; Jefferson R Wilson, FRCSC, MD, PhD; Branko Kopjar, MD, MS, PhD; Alexander Vaccaro, MD, PhD, MBA; Michael Fehlings, MD</i>
7:17 am - 7:22 am	Presentation #2 Surgical Treatment Of Cervical Spondylotic Myelopathy Leads To Functional Improvement In Hand Strength And Dexterity: A Prospective Quantitative Study <i>Tyler S Cole, MD; Jakub Godzik, MD; Jay D Turner, MD, PhD</i>
7:23 am - 7:28 am	Presentation #3 Neck Pain Improvement After Operative Intervention In Patients With Degenerative Cervical Myelopathy: Results From An International Multicenter Ambispective Study Of 664 Patients <i>Michel M Schneider, MD; Jetan Hari Badhiwala, MD; Lindsay Anne Tetreault; Pali Kalsi MD; Mazda Farshad, MD; Keegan Idler; Jefferson Wilson MD, PhD, FRCSC; Michael Fehlings, MD</i>
7:29 am - 7:34 am	Presentation #4 Comparison Of Three Anterior Techniques In The Surgical Treatment Of Three-Level Cervical Spondylotic Myelopathy With Intramedullary T2-Weighted Increased Signal Intensity <i>Cao Peng, MD, PhD; Wen Yuan, MD</i>
7:35 am - 7:39 am	Presentation #5 Comparison Of Laminoplasty And Posterior Decompression With Fusion For Cervical Spondylotic Myelopathy Accompanying Local Kyphosis: A Matched Analysis Using Propensity Scores <i>Satoshi Maki, MD, PhD; Takeo Furuya, MD, PhD; Takuya Miyamoto, MD; Sho Okimatsu; Masao Koda, MD, PhD; Masashi Yamazaki, MD, PhD</i>
7:40 am - 7:51 am	Discussion

7:52 am - 8:33 am	Session II: Complications I <i>Moderators: K Daniel Riew, MD and Vincent Traynelis, MD</i>
7:52 am - 7:57 am	Presentation #6 Clinical And Radiological Analysis Of C5 Palsy In Cervical Spine Surgery Patients: A Korean Cervical Spine Study Group (Kcsvg) Multicenter Study <i>Ho Jin Lee, MD; Jae Keun Oh, MD, PhD; Dong Ho Kang, MD, PhD; Ki-Jeong Kim, MD, PhD; Jung-Woo Hur; Seong Yi, PhD, MD; Jun Jae Shin; Sun Ho Lee; Kyung Chul Choi; Kyung Hyun Kim; Dae-Chul Cho; Yong Jun Jin; In Ho Han; Chun Kee Chung; Jae Taek Hong</i>
7:58 am - 8:03 am	Presentation #7 Which Intraoperative Neuromonitoring Characteristics Are Important For Predicting Neurologic Outcome In Cervical Spine Surgery? <i>Srikanth N Divi, MD; Dhruv K C Goyal, BA; John Mangan, MD, MHA; Justin Stull, MD; Matthew Galetta, BA; Nathan V Houlihan, BS; Ryan Matthew Godinez, BS, MS; Tristan Fried, BS; Jeffrey A Rihn, MD; Mark F Kurd, MD; D Greg Anderson, MD; Alan S Hilibrand, MBA, MD; Alexander Vaccaro, MD, PhD, MBA; Christopher Kepler, MD; Gregory Douglas Schroeder, MD</i>
8:04 am - 8:09 am	Presentation #8 Therapeutic Impact Of Traction Release After C5 Nerve Root Motor Evoked Potential Alerts In Cervical Spine Surgery <i>W Bryan Wilent, PhD; Thomas Epplin-Zapf, MA, MS; Mitali Bose, MS; Eric Tesdahl; Jeffrey Cohen, MD, PhD; Anthony K Sestokas, PhD</i>
8:10 am - 8:15 am	Presentation #9 Predicting Risk Of Post-Operative C5 Palsy Among Patients Undergoing Posterior Cervical Spine Surgery <i>Daniel Lubelski, MD; Adam D'sa BA; Erick Westbroek MD; A Karim Ahmed BS; Timothy Witham, BS, FACS, MD; Nicholas Theodore, FAANS, FACS, MD; Daniel Sciubba, MD</i>
8:16 am - 8:21 am	Presentation #10 Cord Float Back Does Not Predict The Occurrence Of C5 Palsy Amongst Patients Undergoing Posterior Cervical Spine Surgery <i>Daniel Lubelski, MD; Adam D'Sa BA; Erick M Westbroek MD; A Karim Ahmed BS; Timothy Witham, BS, FACS, MD; Nicholas Theodore, FAANS, FACS, MD; Daniel Sciubba, MD</i>
8:21 am - 8:33 am	Discussion

8:34 am - 9:15 am	<p>Session III: Trauma <i>Moderators: James Harrop, MD and Daniel Sciubba, MD</i></p>
8:34 am - 8:39 am	<p>Presentation #11 Early Versus Late Surgical Decompression For Acute Spinal Cord Injury: A Pooled Analysis Of 1,548 Patients <i>Jetan H Badhiwala, MD; Christopher Witiw, MD; Jefferson R Wilson, FRCSC, MD, PhD; Michael Fehlings, MD</i></p>
8:40 am - 8:45 am	<p>Presentation #12 Clinical Outcomes Of Acute Cervical Spinal Cord Injury Depending On The Timing Of Surgery <i>Kyung Jin Song; Jong Hyun Ko, MD; Tae Young Kwon</i></p>
8:46 am - 8:51 am	<p>Presentation #13 Early Versus Late Surgical Decompression For Central Cord Syndrome: A Propensity Score-Matched Analysis <i>Jetan H Badhiwala, MD; Christopher Witiw, MD; Jefferson R Wilson, FRCSC, MD, PhD; Michael Fehlings, MD</i></p>
8:52 am - 8:57 am	<p>Presentation #14 Can The Proposed Posterior Ligament-Bone Injury Classification And Severity Score Predict The Failure Of Anterior-Only Surgery For Subaxial Cervical Facet Dislocations? <i>Jun-song Yang, MD; Ding-Jun Hao; Tuan-Jiang Liu</i></p>
8:58 am - 9:03 am	<p>Presentation #15 Cervical Spine Fractures: Who Really Needs Ct Angiography? <i>Mitchell S Fourman MD, MPhil; Jeremy Dewitt Shaw, MD, MS; Nicholas Vaudreuil, MD; Malcolm Dombrowski, MD; Richard Wawrose, MD; Lorraine Boakye, MD; Louis Alarcon, MD; Joon Yung Lee, MD; William F Donaldson III, MD</i></p>
9:03 am - 9:15 am	Discussion
9:15 am - 9:45 am	<p>Exhibit Hall, Westside Ballroom, 5th Floor Break</p>
9:46 am - 10:49 am	<p>Symposium I: Spine Trauma <i>Moderators: Michael Fehlings, MD, PhD and Alexander Vaccaro, MD, PhD, MBA</i></p>
9:46 am - 9:56 am	<p>Where Do We Stand with Pharmacologic Treatment for SCI? <i>Jefferson Wilson, MD</i></p>
9:57 am - 10:07 am	<p>Lateral Mass and Facet Fractures: When to Operate <i>Gregory D Schroeder, MD</i></p>
10:07 am - 10:17 am	Discussion

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.

- 10:18 am - 10:28 am **Which Patients with Central Cord Need Urgent Surgery?**
W Ryan Spiker, MD
- 10:29 am - 10:39 am **Management of Cervical Spine Fractures in an Ankylosed Spine**
Addisu Mesfin, MD
- 10:39 am - 10:49 am Discussion
- 10:50 am - 11:25 am **Presidential Introduction and Address**
- 10:50 am - 10:55 am **Introduction of CSRS President**
Rick Sasso, MD
- 10:55 am - 11:25 am **Presidential Address**
Alexander Vaccaro, MD, PhD, MBA

Industry Workshops

Lunch Available for Workshop Attendees Only, Prior Registration Not Required, No CME Credits

- 11:30 am - 1:30 pm **Workshop 1: Medtronic** *Shubert/Uris, 6th Floor*
Circumferential Fixation in the Complex Corpectomy Patient
- Workshop 2: NuVasive** *Majestic/Music Box, 6th Floor*
Cervical Spine Surgery: Why Should I Change? Featuring Advanced Materials Science.
- Workshop 3: DePuy Synthes** *Ziegfield, 4th Floor*
The F.A.T.E. of Complex Cervical Surgery featuring the SYMPHONY™ OCT System
- Workshop 4: Globus Medical** *Oneill, 4th Floor*
Cervical Corpectomy for Spondylotic Myelopathy
- Workshop 5: Zimmer Biomet** *Wilder, 4th Floor*
30% at 10 years? The Experts Discuss Techniques & Technology to Reduce Adjacent Segment Disease: A Discussion on How to Protect Against Adjacent Level Cervical Pathology
- Workshop 6: Stryker** *Odets, 4th Floor*
Management of Complex Cervical Pathologies: An Interactive Panel Discussion
- 1:35 pm - 2:38 pm **Symposium II: Pearls from the Experts**
Moderators: Andrew Dailey, MD, FAANS and Justin S Smith, MD, PhD
- 1:35 pm - 1:45 pm **How to Achieve Good Outcomes with 4-Level ACDF**
Alan S Hilibrand, MD
- 1:46 pm - 1:56 pm **How and When to Use Cervical Pedicle Screws**
Sang Hun Lee, MD
- 1:56 pm - 2:06 pm Discussion

Individual Disclosures can be found in the Disclosure Index pages 41-69.

- 2:07 pm - 2:17 pm **Pearls for Instrumentation and Reconstructive Techniques in the Pediatric Cervical Spine**
Heiko Koller, PhD, MD
- 2:18 pm - 2:28 pm **En Bloc Cervical Tumor Resection: Surgical Technique and Pearls for Optimizing Outcomes**
Christopher Ames, MD
- 2:28 pm - 2:38 pm Discussion
- 2:39 pm - 3:24 pm **Session IV: Cervical Deformity**
Moderators: Jacob Buchowski, MD and Jason Savage, MD
- 2:39 pm - 2:44 pm Presentation #16
What Drives Disability In Cervical Deformity: Novel Patient Generated Outcome Versus Legacy Hrql
Nicholas D Stekas, MS; Ethan W Ayres, MPH; Mohamed A Moawad, MPH; Brooke K O'Connell; Dainn Woo, BS; Michael L Smith, MD; Yong H Kim, MD; Aaron James Buckland, FRACS, MBBS; Themistocles S Protopsaltis, MD
- 2:45 pm - 2:50 pm Presentation #17
Intraoperative Alignment Goals For Severe Cervical Deformity To Achieve Optimal Improvements In Health-Related Quality Of Life Measures
Sohrab Virk, MD; Peter Gust Passias, MD; Renaud Lafage; Eric O Klineberg, MD; Gregory Michael Mundis Jr, MD; Themistocles Stavros Protopsaltis, MD; Christopher I Shaffrey, MD; Robert Shay Bess, MD; Han Jo Kim, MD; Christopher Ames, MD; Frank J Schwab, MD; Justin S Smith, MD; Virginie Lafage, PhD
- 2:51 pm - 2:56 pm Presentation #18
Improvement In Cervical Lordosis And Sagittal Alignment After Vertebral Body Sliding Osteotomy In Patients With Spondylitic Cervical Myelopathy And Kyphosis
Dong-Ho Lee, MD; Jae Hwan Cho; Jae-Woo Park, MD; Chul-Gie Hong; Jung-Gi Ha
- 2:57 pm - 3:02 pm Presentation #19
Pre-Operative Extension Lateral Cervical Radiographs Are Associated With Osteotomy Type, Approach And Post-Operative Cervical Alignment Following Cervical Deformity Surgery
Eric O Klineberg, MD; Renaud Lafage; Munish C Gupta, MD; Peter Gust Passias, MD; Virginie Lafage, PhD; Justin S Smith, MD; Han Jo Kim, MD; Themistocles Stavros Protopsaltis, MD; Douglas C Burton, MD; Gregory Michael Mundis Jr, MD; Frank J Schwab, MD; Robert A Hart, MD; Christopher I Shaffrey, MD; Christopher Ames, MD

- 3:03 pm - 3:08 pm Presentation #20
Simulated Corrections Of Cervical Deformity Using In-Construct Measures Demonstrate That Insufficient Corrections Result In Djk
Themistocles S Protopsaltis, MD; Dainn Woo, BS; Anand Segar, MD; Renaud Lafage; Gregory Michael Mundis Jr, MD; Justin S Smith, MD; Eric O Klineberg, MD; Peter Gust Passias, MD; Robert Shay Bess, MD; Christopher I Shaffrey, MD; Frank J Schwab, MD; Virginie Lafage, PhD; Christopher Ames, MD
- 3:09 pm - 3:14 pm Presentation #21
Comparison Of Perioperative Complications Following Posterior Column Osteotomies Versus Posterior Based Three Column Osteotomy For Correction Of Severe Cervical Sagittal Deformity In 95 Patients: A Single Center Study
Darryl Lau, MD; Vedat Deviren, MD; Christopher Ames, MD
- 3:14 pm - 3:24 pm Discussion
- 3:25 pm - 3:55 pm **Exhibit Hall, Westside Ballroom, 5th Floor Break**
- 3:56 pm - 4:59 pm **Session V: Complications II**
Moderators: Alan S Hilibrand, MD and Alpesh Patel, MD, FACS
- 3:56 pm - 4:01 pm Presentation #22
Effect Of Local Retropharyngeal Steroids On Fusion Rate After Anterior Cervical Discectomy And Fusion
Sapan D Gandhi, MD; Steven Wahlmeier, MD; Philip Louie, MD; Ryan Sauber, MD; Trevor Tooley, BS; Kevin C Baker, PhD; Daniel K Park, MD
- 4:02 pm - 4:07 pm Presentation #23
Effect Of Topical Steroid On Swallowing Following Acdf: Results Of A Prospective Randomized Double Blind Control Trial
Daniel Stein, BS; Han Jo Kim, MD; Darren Richard Lebl, MD; Russel C Huang, MD; Renaud Lafage; Todd J Albert, MD
- 4:08 pm - 4:13 pm Presentation #24
A Prospective Cohort Study Of Dysphagia After Subaxial Cervical Surgery
Kenichiro Sakai, MD, PhD; Toshitaka Yoshii; Takashi Hirai; Yoshiyasu Arai, MD, PhD; Atsushi Okawa, MD, PhD
- 4:14 pm - 4:19 pm Presentation #25
Association Between The Severity Of Dysphagia And Various Parameters Of The Cervical Spine; Videofluoroscopic Analysis In Neutral And Retraction Position Of The Normal Volunteers
Jae Taek Hong, MD, PhD; Seong Hoon Lim; Dong Hoon Lee; Jun Seong Kim

Individual Disclosures can be found in the Disclosure Index pages 41-69.

- 4:19 pm - 4:27 pm Discussion
- 4:28 pm - 4:33 pm Presentation #26
Same Day Surgical Intervention Dramatically Minimizes Complication Occurrence And Optimizes Peri-Operative Outcomes For Central Cord Syndrome
Peter Passias, MD; Cole Bortz, BA; Avery Eugene Brown; Haddy Alas, BS; Katherine E Pierce; M Burhan Janjua, MD; Paul Park, MD; Charles Wang, MD; Alexandra Soroceanu, MD; Rafael De La Garza Ramos, MD; Daniel Sciubba, MD; Anthony Frempong-Boadu, MD; Dennis Vasquez-Montes, MS; Bassel Diebo, MD; Michael C Gerling, MD
- 4:34 pm - 4:39 pm Presentation #27
Prospective Risk Factor Analysis Of Surgery-Related Complications In Primary Cervical Spine Surgery For Degenerative Diseases
Shota Takenaka, MD; Takahiro Makino, MD, MSc; Yusuke Sakai; Hideki Yoshikawa, MD; Takashi Kaito, MD, PhD
- 4:40 pm - 4:45 pm Presentation #28
The Influence Of Frailty Of Patients On The Incidence Of Surgical Site Infection After Spine Surgery –The Analysis Of Over 1000 Cases
Tomoya Yoshikawa, MD; Shuichi Kaneyama, MD, PhD; Masatoshi Sumi, MD, PhD; Koichi Kasahara, MD, PhD; Aritetsu Kanemura, MD, PhD; Hiroaki Hirata, MD, PhD
- 4:46 pm - 4:51 pm Presentation #29
Upper Cervical Surgery, Increased Signal Intensity Of The Spinal Cord, And Hypertension As Risk Factors For Dyspnea After Multilevel Anterior Cervical Discectomy And Fusion
Jae Keun Oh, MD, PhD
- 4:51 pm - 4:59 pm Discussion
- 5:00 pm - 6:30 pm **Exhibit Hall, Westside Ballroom, 5th Floor**
Welcome Reception

- 7:00 am - 7:10 am **Welcome and Announcements**
Moderators: Gregory D Schroeder, MD and Justin S Smith, MD, PhD
- 7:11 am - 7:58 am **Session VI: Outcomes IV**
Moderators: Howard S An, MD and Kris Radcliff, MD
- 7:11 am - 7:16 am Presentation #30
Nonoperative Management Of Asymptomatic Cervical Spinal Stenosis: A Long-Term Follow-Up Study
Michael P Kelly, MD, MSc; Lukas Peter Zebala, MD; K Daniel Riew, MD
- 7:17 am - 7:22 am Presentation #31
Prospective Evaluation Of Degenerative Cervical Myelopathy In Asymptomatic Patients Over 60 Years
Samuel Adams, MD; Sara Holmes; Letterio Salvatore Politi, MD; Patrick J Connolly, MD; Michael Paul Stauff, MD
- 7:23 am - 7:28 am Presentation #32
Home Versus Standard Physical Therapy After Acdf Surgery: Preliminary Results Of Health-Related Quality Of Life Outcomes From A Randomized Controlled Trial
Srikanth Divi, MD; Dhruv K C Goyal, BA; Matthew Galetta, BA; Justin Stull, MD; John Mangan, MD, MHA; Jeffrey A Rihn, MD; Mark F Kurd, MD; D Greg Anderson, MD; Barrett Ivory Woods, MD; Kristen E Radcliff, MD; Ian Kaye, MD; Alan S Hilibrand, MBA, MD; Alexander Vaccaro, MD, PhD, MBA; Christopher Kepler, MD; Gregory D Schroeder, MD
- 7:29 am - 7:34 am Presentation #33
Effectiveness Of Surgical Treatment In Reducing Falls And Fall-Related Neurological Deterioration In Patients With Degenerative Cervical Myelopathy: A Multi-Institutional Prospective Study
Atsushi Kimura, MD, PhD; Hirokazu Inoue, MD, PhD; Yasuyuki Shiraishi; Katsushi Takeshita, MD, PhD; Atsushi Okawa
- 7:35 am - 7:40 am Presentation #34
Improvement In Cervicogenic Headaches After Laminoplasty: A Single Institutional Study Of 143 Adult Patients
Owoicho Adogwa, MD, MPH; K Daniel Riew, MD; Gaurang Gupte; Maksim Shlykov, MD; Lukas Peter Zebala, MD; Colleen M Peters, MA; Jacob M Buchowski, MD, MS; Michael Patrick Kelly, MD

- 7:41 am - 7:46 am Presentation #35
Improvements In Neck Pain And Disability Following C1-C2 Posterior Cervical Instrumentation And Fusion For Atlanto-Axial Osteoarthritis
Owoicho Adogwa, MD, MPH; Jacob M Buchowski, MD, MS; John Sielatycki, MD; Alexander Theologis, MD; Maksim Aleksandrovich Shlykov, MD, MS; James D Lin, MD, MS; K Daniel Riew, MD
- 7:46 am - 7:58 am Discussion
- 7:59 am - 8:38 am **Session VII: Basic Science**
Moderators: Brian Kwon, MD and Thomas Mroz, MD
- 7:59 am - 8:04 am Presentation #36
Lotus Over Expression Enhanced The Motor Function Recovery Following Ips-Ns/Pc Transplantation
Shuhei Ito, MD; Narihito Nagoshi; Osahiko Tsuji, MD, PhD; Morio Matsumoto, MD; Masaya Nakamura, MD
- 8:05 am - 8:10 am Presentation #37
Involvement Of Autophagy In Human Cervical Spine Degenerated And Herniated Discs
Takashi Yurube, MD, PhD; Yuji Kakiuchi; Masaaki Ito; Yoshiki Takeoka; Yutarō Kanda, MD; Ryu Tsujimoto; Kenichiro Kakutani, MD; Toru Takada; Kunihiko Miyazaki; Shingo Miyazaki, MD; Zhongying Zhang; Ryosuke Kuroda, MD; Kotaro Nishida
- 8:11 am - 8:16 am Presentation #38
Inhibiting Spinal Phospholipase A2 Prevents Pain & Attenuates Spinal Neuron Activity After Nerve Root Compression
Sonia Kartha, BA; Julia Cecilia Hotek, PhD; Beth A Winkelstein, PhD
- 8:17 am - 8:22 am Presentation #39
Electrospun Synthetic Bone Graft Promotes Msc Function And Spinal Fusion
Derek G Ju, MD; Juliane D Glaeser, PhD; Linda E A Kanim, MA; Khosrowdad Salehi, BS; Phillip H Behrens IV, MD; Melodie Metzger, PhD; Dmitriy Sheyn, PhD; Hyun W Bae, MD
- 8:23 am - 8:28 am Presentation #40
Intraarticular Mmp-1 Is Sufficient To Induce Pain & Substance P Regulation In Drg Afferents Absent Any Structural Damage
Meagan Eleanor Ita, MS; Beth A Winkelstein, PhD
- 8:28 am - 8:38 am Discussion

- 8:39 am - 9:20 am **Research Grant Session**
Brandon Lawrence, MD and Zoher Ghogawala, MD
- 8:39 am - 8:48 am **Announcement - 2019 Research Grant Winners**
- 8:49 am - 8:50 am **Introduction- Research Grant Updates**
- 8:51 am- 8:53 am 2018 21st Century Grant
New Approaches in Salamanders as Platforms for Uncovering Spinal Cord Regeneration Factors
Hani Singer
- 8:54 am - 8:56 am 2018 Medtronic Grant
Spinal Cord Perfusion Pressure Management in Acute Cervical SCI
Brian Kwon, MD, PhD, FRCSC
- 8:56 am - 8:59 am 2018 Resident Fellow Grant
Advanced Quantitative MRI to Measure Cervical Cord Tissue Injury and Predict Outcomes
Muhammad Ali Akbar, MD
- 9:00 am - 9:02 am 2018 Resident Fellow Grant
Evaluating the Influence of Impaired Cervical Cord Blood Perfusion on Clinical Severity of Cervical Myelopathy Using Intravoxel Incoherent Motion MRI
Shuo Niu, MD, PhD
- 9:03 am - 9:05 am 2018 Seed Starter Grant
Morphological, Biochemical and Biomechanical Characterization of Human Cervical Endplate in Degenerated Disc
Yongren Wu, PhD
- 9:06 am - 9:08 am 2018 Seed Starter Grant
Is vaporized nicotine as detrimental to spinal fusions as cigarette smoke?
Jesse Bible, MD
- 9:09 am - 9:11 am 2018 Seed Starter Grant
CT Osteoabsorbptiometry assessment of subchondral bone density predicts intervertebral subsidence in a human cadaver model
Matthew Colman, MD
- 9:12 am - 9:14 am 2018 Seed Starter Grant
Reorganization of Brain Architecture and Networks as Biomarkers for Cervical Myelopathy
Ammar Hawasli, MD, PhD

- 9:15 am - 9:17 am 2018 Seed Starter Grant
Assessment of Variation in Preoperative Expectations and Subsequent Fulfillment for Patients Undergoing Elective Cervical Spine Surgery
Inamullah Khan, MBBS
- 9:18 am - 9:19 am Discussion
- 9:20 am - 9:54 am **Exhibit Hall, Westside Ballroom, 5th Floor**
Break
- 9:55 am - 11:00 am **Presidential Guest Lecture**
- 9:55 am - 10:00 am **Introduction of Presidential Guest Speaker**
Alexander Vaccaro, MD, PhD, MBA
- 10:00 am - 10:45 am **Henry Bohlman Presidential Guest Speaker: "Healthcare in America"**
Steve Forbes, Chairman and Editor-in-Chief of Forbes Media
- 10:45 am - 11:01 am Discussion
- 11:02 am - 12:05 pm **Symposium III: Concussions, Spine Injury, and Return to Play**
Moderators: Wellington Hsu, MD and Alexander Vaccaro, MD, PhD, MBA
- 11:02 am - 11:09 am **Prevention and Evaluation of Concussions in the NFL**
Stephen Stache, MD
- 11:10 am - 11:17 am **Sideline Evaluation: When Does a Player Need to be Removed From Play?**
Andrew Dossett, MD
- 11:17 am - 11:25 am Discussion
- 11:26 am - 11:33 am **Two- and Three-Level Disease: When Can a Patient Return to Play after Multilevel Anterior and Posterior Procedures?**
Robert Watkins III, MD
- 11:34 am - 11:41 am **Asymptomatic Spinal Cord Compression: Is Surgery Necessary to Allow Return to Play?**
Andrew Hecht, MD
- 11:41 am - 11:49 am Discussion
- 11:49 am - 12:05 pm **Review of CSRS Survey on Return to Play and a Modified Delphi Method Establishing CSRS Return to Play Guidelines**
Gregory D Schroeder, MD
- 12:05 pm - 1:05 pm **Exhibit Hall, Westside Ballroom, 5th Floor**
Lunch
- 1:10 pm - 1:36 pm **Traveling Fellowship Report and Meeting Previews**
John Rhee, MD

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.

- 1:10 pm - 1:18 pm **Traveling Fellowship Report**
Ilyas S. Aleem, BSc, MD, MS, FRCSC and Lee A. Tan, M.D.
- 1:19 pm - 1:24 pm **Preview CSRS 2020 Annual Meeting in Las Vegas, NV**
Michael Daubs, MD, 2020 Meeting Local Host
- 1:25 pm - 1:30 pm **Preview CSRS Asia Pacific Section 2020 Annual Meeting**
Kyung-Soo Suk, MD, President CSRS - AP
- 1:31 pm - 1:36 pm **Preview CSRS European Section 2020 Annual Meeting**
Björn Zoëga, MD, President CSRS - EU
- 1:37 pm - 2:24 pm **Session VIII: Motion Preservation**
Moderators: Frank Phillips, MD and Rick Sasso, MD
- 1:37 pm - 1:42 pm Presentation #41
Two-Level Cervical Disc Arthroplasty Vs. Anterior Cervical Discectomy And Fusion: Ten- Year Outcomes Of A Prospective, Randomized Ide Clinical Trial
Jeffrey R McConnell, MD; Matthew F Gornet, MD; Todd Hopkins Lanman, MD, FACS; J Kenneth Burkus, MD; Randall F Dryer, MD; Scott D Hodges, DO; Francine Schranck, RN, BSN
- 1:43 pm - 1:48 pm Presentation #42
Single-Level Cervical Arthroplasty With Prodisc-C Artificial Disc: 10-Year Follow-Up Results In One Center
Yanbin Zhao, MD; Yu Sun, MD
- 1:49 pm - 1:54 pm Presentation #43
Unintended Fusion In Cervical Artificial Disc Replacement: A Prospective Study On Heterotopic Ossification, Evolution Through Time, And Clinical Outcome, With 5 Years Follow-Up
Catarina Marques, MD; Anna Marianne Mac Dowall, MD; Martin Skeppholm; Nuno Canto Moreira, MD, PhD; Claes Olerud, MD
- 1:55 pm - 2:00 pm Presentation #44
Does Positioning Of Cervical Disc Arthroplasty Implant Affect Postoperative Outcome
Yahya Azhar Othman Othman; Philip York, MD; Russel C Huang, MD; Avani Vaishnav, MBBS; Steven McAnany, MD; Sravisht Iyer, MD; Todd J Albert, MD; Catherine Himo Gang, MPH; Sheeraz Qureshi, MD

- 2:01 pm - 2:06 pm Presentation #45
The Effect Of Acdf Or Arthroplasty On Cervicogenic Headaches: A Post-Hoc Analysis Of A Prospective, Multicenter Study With 10-Year Follow-Up
K Daniel Riew, MD; Matthew F Gornet, MD; Todd Hopkins Lanman, MD, FACS; Jeffrey Ross McConnell, MD; Randall F Dryer, MD; J Kenneth Burkus, MD
- 2:07 pm - 2:12 pm Presentation #46
Comparison Of Three Fda-Approved Artificial Cervical Discs: A Finite Element Study
Hoon Choi, MD, MS; Yuvaraj Purushothaman, MS; Jamie Lynn Baisden, MD; Narayan Yoganandan, MD
- 2:12 pm - 2:24 pm Discussion
- 2:25 pm - 2:55 pm **Broadway Ballroom Foyer, 6th Floor Break**
- 2:56 pm - 3:58 pm **Session IX: Outcomes II**
Moderators: Eric O Klineberg, MD and Jeffrey Wang, MD
- 2:56 pm - 3:01 pm Presentation #47
Mid-Term Surgical Outcome Of Posterior Decompression With Instrumented Fusion For K-Line Negative Type Cervical Opll -Minimum 5 Years Follow-Up
Takeo Furuya, MD, PhD; Satoshi Maki, MD, PhD; Takuya Miyamoto, MD; Sho Okimatsu; Masao Koda, MD, PhD; Masashi Yamazaki, MD, PhD
- 3:02 pm - 3:07 pm Presentation #48
Does Pre- Or Post-Operative Cervical Sagittal Alignment Correlate With The Outcomes Of Cervical Laminoplasty? A Minimum Of One-Year Follow-Up Study
Shuo Niu, MD, PhD; Albert Anastasio, BA; Kevin Xavier Farley, BA; John JM Rhee, MD
- 3:08 pm - 3:13 pm Presentation #49
The Effect Of Duration Of Symptoms On Clinical Outcomes Following Anterior Cervical Discectomy And Fusion
Joon Sung Yoo, BA; Dil V Patel, BS; Eric H Lamoutte, BS; Sailee S Karmarkar, BS; Kern Singh, MD; Nathaniel W Jenkins, MS; James M Parrish, MPH

- 3:14 pm - 3:19 pm Presentation #50
The Impact Of Post-Operative Physical Therapy On Patient-Reported Outcomes At 1-Year After Cervical Spine Surgery
Kristin R Archer, PhD; Emily Oleisky; Jacquelyn S Pennings, PhD; Inamullah Khan, MBBS; Rogelio Adrian Coronado, PhD, PT; Clinton J Devin, MD
- 3:19 pm - 3:27 pm Discussion
- 3:28 pm - 3:33 pm Presentation #51
Asymptomatic Acdf Non-Unions Underestimate The True Prevalence Of Radiographic Pseudoarthrosis
Charles Hopkins Crawford III, MD; Leah Yacat Carreon, MD; Praveen V Mummaneni; Steven D Glassman, MD
- 3:34 pm - 3:39 pm Presentation #52
Does Chronic Preoperative Opioid Use Affect Patient Outcomes After Acdf Surgery
John Mangan, MD, MHA; Srikanth Divi, MD; Dhruv K C Goyal, BA; Justin Stull, MD; Matthew Galetta, BA; Jeffrey A Rihn, MD; Mark F Kurd, MD; D Greg Anderson, MD; Barrett Ivory Woods, MD; Kristen E Radcliff, MD; Ian Kaye, MD; Alan S Hillibrand, MBA, MD; Alexander Vaccaro, MD, PhD, MBA; Christopher Kepler, MD; Gregory Douglas Schroeder, MD
- 3:40 pm - 3:45 pm Presentation #53
Can We Predict A Patient's Arm Pain, Neck Pain, And Disability Level One Year After Cervical Spine Surgery For Radiculopathy?
Ahilan Sivaganesan, MD; Inamullah Khan, MBBS; Hui Nian, PhD; Frank E Harrell Jr, PhD; Jacquelyn S Pennings, PhD; Mohamad Bydon, MD; Anthony Asher; Kristin Archer, PhD; Clinton J Devin, MD
- 3:46 pm - 3:51 pm Presentation #54
Preliminary Results From The Multi-Center Prospective, Randomized Csm-S Study: Overall Quality Of Life Improvement, Complications, And Return To Work
Zoher Ghogawala, MD, FACS; Adam Kanter, MD; Praveen V Mummaneni; Erica Fay Bisson, MD, MPH; James S Harrop, MD; Subu Magge; Robert F Heary, FAANS, MD; Michael P Steinmetz, MD; Michael Fehlings, MD; Todd J Albert, MD; Paul M Arnold, MD, FACS; K Daniel Riew, MD; Marjorie Wang, FAANS, MD, MPH; John G Heller, MD; Edward Benzel, MD
- 3:51 pm - 3:59 pm Discussion
- 4:00 pm - 4:30 pm **CSRS Membership Meeting**

- 7:00 am - 7:10 am **Welcome and Announcements**
Moderators: Gregory D Schroeder, MD and Justin S Smith, MD, PhD
- 7:11 am - 8:14 am **Session X: Complications III and Outcomes III**
Moderators: Darrel Brodke, MD and Kazuhiro Chiba, MD
- 7:11 am - 7:16 am Presentation #55
Fate Of Anterior Cervical Discectomy (Acdf) Non-Union At 6 Months
K Daniel Riew, MD; Allan D Levi, MD; William Francis Lavelle, MD; Jeffrey E Florman
- 7:17 am - 7:22 am Presentation #56
Epidemiology Of Iatrogenic Vertebral Artery Injury In Cervical Spine Surgery: 21 Multicenter Studies
Chang-Hyun Lee, MD, MSc; Jae Taek Hong, MD, PhD; Chi Heon Kim, MD, PhD; Chun Kee Chung, MD; Jae Keun Oh, MD, PhD; Dong Ho Kang, MD, PhD; Hojin Lee; Seung-Jae Hyun, MD, PhD; Seong Yi, PhD, MD; Jun Ho Lee, MD; Dae-Chul Cho, MD, PhD; Jun-Jae Shin, MD, PhD; Yong Jun Jin, MD, PhD; Geun Sung Song, MD, PhD
- 7:23 am - 7:28 am Presentation #57
Is Facet Joint Distraction A Cause Of Postoperative Axial Neck Pain After Acdf Surgery?
Srikanth N Divi, MD; Dhruv K C Goyal, BA; John Mangan, MD, MHA; Justin Stull, MD; Nathan V Houlihan, BS; Matthew Galetta, BA; Jeffrey A Rihn, MD; Mark F Kurd, MD; D Greg Anderson, MD; Alan S Hilibrand, MBA, MD; Alexander Vaccaro, MD, PhD, MBA; Christopher Kepler, MD; Gregory Douglas Schroeder, MD; Joseph K Lee, MD
- 7:29 am - 7:34 am Presentation #58
Degenerative Cervical Spondylolisthesis: Does Adjacent Level Surgical Stabilization Result In Progressive Listhesis?
Philip K Louie, MD; Jannat Khan; Hollis Johanson; Jacob Tomas Emerson, BA; Bryce A Basques, MD; Michael T Nolte, MD; Dino Samartzis, PhD; Howard An
- 7:34 am - 7:42 am Discussion
- 7:43 am - 7:48 am Presentation #59
Crossing The Cervicothoracic Junction During Laminectomy And Posterior Spinal Fusion Surgery For Cervical Spondylotic Myelopathy Is Associated With Superior Cervical Radiographic Outcomes
Andrew Kai-Hong Chan, MD; Ryan Badiie, BA, BS; Joshua Rivera; Chih-Chang Chang, MD; Leslie C Robinson, MD, PharmD, MBA; Ratnesh N Mehra DO; Lee A Tan, MD; Aaron J Clark MD, PhD; Sanjay S Dhall MD; Dean Chou, MD; Praveen V Mummaneni, MD

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- 7:49 am - 7:54 am Presentation #60
Assessing Radiographic Fusion Rates Following A Stand-Alone Interbody Cage Versus An Anterior Plate Construct For Adjacent Segment Disease After Anterior Cervical Discectomy And Fusion
Sapan D Gandhi, MD; Adam Fahs, MD; Steven Wahlmeier, MD; Philip Louie, MD; Daniel Robert Possley, DO; Jad Khalil, MD; Kevin C Baker, PhD; Daniel K Park, MD
- 7:55 am - 8:00 am Presentation #61
Sagittal Parameters Poorly Predict Clinical Outcomes Following Anterior Cervical Discectomy And Fusion
Bryce A Basques, MD; Jannat Khan; Michael T Nolte, MD; Philip Louie, MD; Kamran Movassaghi, MD; Jonathan S Markowitz, BS; Edward Jay Goldberg, MD; Howard An
- 8:01 am - 8:06 am Presentation #62
Discrepancies In The Surgical Management Of Central Cord Syndrome: Assessment Of Non-Operative, Surgical, And Crossover To Surgery Patients
Peter Passias, MD; Cole Bortz, BA; Katherine E Pierce; Haddy Alas, BS; Avery Eugene Brown; Nicholas Shepard, MD; M Burhan Janjua, MD; John Buza, MD; Alexandra Soroceanu, MD; Rafael De La Garza Ramos, MD; Daniel Sciubba, MD; Dennis Vasquez-Montes, MS; Bassel Diebo, MD; Michael C Gerling, MD
- 8:06 am - 8:14 am Discussion
- 8:15 am - 9:18 am **Session XI: Surgical Techniques and Imaging Parameters**
Moderators: Paul Arnold, MD and John Rhee, MD
- 8:15 am - 8:20 am Presentation #63
Microendoscopic Laminotomy Versus Conventional Laminoplasty For Cervical Spondylotic Myelopathy - A 5-Year Follow-Up Study
Akihito Minamide, MD, PhD; Andrew K Simpson, MD; Yukihiro Nakagawa; Motohiro Okada; Hiroshi Iwasaki; Shunji Tsutsui, MD, PhD; Masanari Takami, MD; Ryo Taiji; Shizumasa Murata; Takuhei Kozaki Jr, MRCPCH, MRCPe, MRCSEd, MS, MSA, MSc, MSN; Hiroshi Hashizume, MD; Yasutsugu Yukawa; Munehito Yoshida; Hiroshi Yamada, MD
- 8:21 am - 8:26 am Presentation #64
Effect Of C3 Laminectomy In Cervical Laminoplasty For Degenerative Cervical Myelopathy: C3 Laminectomy Vs. C3 Laminoplasty
Koji Nakajima, MD; Toru Doi; So Kato, MD; Sakae Tanaka, MD, PhD; Yasushi Oshima, MD, PhD

- 8:27 am - 8:32 am Presentation #65
Minimally-Invasive Posterior Cervical Foraminotomy As An Alternative To Anterior Cervical Discectomy And Fusion For Unilateral Cervical Radiculopathy
Nikhil Sahai, MD; Stuart Changoor, MD; Conor Dunn, MD, MS; Michael Faloon, MD; Kumar Gautam Sinha, MD; Ki S Hwang, MD; Arash Emami, MD
- 8:33 am - 8:38 am Presentation #66
Optimizing Cervicothoracic Junction Biomechanics After C7 Pedicle Subtraction Osteotomy: A Cadaveric Study Of Stability And Rod Strain
*Jakub Godzik, MD; Jennifer Lehrman, BS, MS; Bernardo de Andrada Pereira; Christopher Ames, MD; Heiko Koller, MD; Kevin Fun Lee, MS; Anna Sawa Newcomb, MS; Jay D Turner, MD, PhD; **Brian P Kelly, PhD***
- 8:38 am - 8:46 am Discussion
- 8:47 am - 8:52 am Presentation #67
A Deep Learning Model For Detection Of Cervical Spinal Cord Compression In Mri Scans
Zamir Merali, MD; Jetan Hari Badhiwala, MD; Christopher Witiw, MD; Jefferson R Wilson, FRCSC, MD, PhD; Michael Fehlings, MD
- 8:53 am - 8:58 am Presentation #68
Intervertebral Foramen Width Is An Important Factor In Deciding Additional Uncinate Process Resection In Acdf -- A Retrospective Study
Yang Liu, MD
- 8:59 am - 9:04 am Presentation #69
A New Index For Making Decisions Regarding C2 Lamina Decompression In Cervical Ossification Of The Posterior Longitudinal Ligament: The R-Line
Jin Hoon Park, MD, PhD; Lee Byung-Jou; Seong Kyun Jeong; Subum Lee, MD; Myeongjong Kim
- 9:05 am - 9:10 am Presentation #70
Can C7 Slope Be Used As A Substitute For T1 Slope? A Radiographic Analysis
*Jun Sup Kim, MD; **Ivan Ye**; Ray Tang, BA; Samuel Johnston Waring White, BA; Samuel Kang-Wook Cho, MD*
- 9:10 am - 9:18 am Discussion

- 9:19 am - 10:22 am **Symposium IV: Cervical Deformity and Complex Cervical Reconstruction**
Moderators: Christopher Ames, MD and Han Jo Kim, MD
- 9:19 am - 9:29 am **Alignment Planning for Deformity Correction**
Themistocles S Protopsaltis, MD
- 9:30 am - 9:40 am **Management of Cervical Deformity Resulting from Trauma**
Heiko Koller, PhD, MD
- 9:40 am - 9:50 am Discussion
- 9:51 am - 10:01 am **Three-Column Osteotomies for Deformity Correction: Technique and Video Demonstration**
Christopher Ames, MD
- 10:02 am - 10:12 am **Complications Associated with Complex Cervical Reconstruction: Occurrence and Techniques for Avoidance**
Peter Passias, MD
- 10:12 am - 10:22 am Discussion
- 10:22 am - 10:28 am **Announcement of Abstract and E-Poster Award Winners**
Jeffrey D Coe, MD, Awards Committee Chair
- 10:28 am - 10:33 am **Presentation of CSRS Medallion to Incoming President Rick Sasso, MD**
Alexander Vaccaro, MD, PhD, MBA
- 10:34 am - 11:14 am **Session XII: Economics, Safety, and Health Policy**
Moderators: Michael P Kelly, MD, MSc and Michael Steinmetz, MD
- 10:34 am - 10:39 am Presentation #71
Effect Of Opioid-Limiting Legislation On Postoperative Prescription Patterns Following Anterior Cervical Decompression And Fusion
Daniel B C Reid, MD, MPH; Kalpit Nimish Shah, MD; Benjamin Shapiro, MS; Jack H Ruddell, BA; Edward Akelman, MD; Mark A Palumbo, MD; Alan H Daniels, MD
- 10:40 am - 10:45 am Presentation #72
Perioperative Spending In Single-Level Anterior Cervical Discectomy And Fusion For Degenerative Pathology
Majd Marrache, MD; Andrew Harris, BS; Varun Puvanesarajah, MD; Micheal Raad, MD; Amit Jain, MD

- 10:46 am - 10:51 am Presentation #73
The Fault Within Our “Drugs”: Refining Risk-Adjustment For Bundled Payment Models In Cervical Fusions
Azeem Tariq Malik, MBBS; Frank M Phillips, MD; Sheldon Michael Retchin, MD, MSPH; Wendy Xu; Elizabeth M Yu, MD; Jeffery D Kim, MD; Safdar N Khan, MD
- 10:52 am - 10:57 am Presentation #74
Anterior Cervical Discectomy And Fusions (Acdfs) At Physician Owned Hospitals – Is It Time To Reconsider The Sanctions Of The Affordable Care Act (Aca)?
Azeem Tariq Malik, MBBS; Sheldon Michael Retchin, MD, MSPH; Wendy Xu; Frank M Phillips, MD; Safdar N Khan, MD
- 10:58 am - 11:03 am Presentation #75
No S.C.A.R.E Protocol: A Streamlined Safety Protocol
Tyler J Jenkins, MD; Ryan D Snowden, MD; Joseph Douglas Smucker, MD; Wellington K Hsu, MD; K Daniel Riew, MD; Rick C Sasso, MD
- 11:03 am - 11:14 am Discussion
- 11:15 am - 11:29 am **Broadway Ballroom Foyer, 6th Floor Break**
- 11:29 am - 12:44 pm **Session XIII: Focused Podium Presentations**
Moderators: Michael Daubs, MD and Robert Hart, MD
- 11:29 am - 11:31 am Presentation #76
Anterior Cord Compression Is Associated With Neurologic Deficit In Patients With Degenerative Cervical Myelopathy. Does It Have Evidence?
Kyung Chung Kang, MD; Jung-Hee Lee, MD; Ki Young Lee; Hyoungmin Kim; Sang Kyu Im; Jong-Beom Park
- 11:32 am - 11:34 am Presentation #77
Cervical Bone Mineral Density Measured By Qct In Patients Undergoing Anterior Cervical Spine Surgery
Stephan N Salzman, MD; Courtney Ortiz Miller, BA; Ichiro Okano, MD; Fabian Winter; Jennifer Shue, MS; John Anthony Carrino, MD; Andrew A Sama, MD; Frank P Cammisa Jr, MD; Federico P Girardi, MD; Alexander P Hughes, MD
- 11:35 am - 11:37 am Presentation #78
Continuous Optical Monitoring Of Spinal Cord Hemodynamics During The First 7 Days Post-Injury In A Porcine Model Of Acute Spinal Cord Injury
Brian K Kwon, MD, PhD, FRCS; Neda Manouchehri; So Kitty; Cheung Amanda; Streijger Femke; Macnab Andrew; Shadgan Babak

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- 11:38 am - 11:40 am Presentation #79
Risk Factors Associated With Vertebral Artery Anomalies In The Subaxial Cervical Spine
*Erika Chiapparelli Harb, MD; Stephan N Salzmann, MD; Colleen Rentenberger; Jennifer Shue, MS; Ichiro Okano, MD; Andrew A Sama, MD; Federico P Girardi, MD; Frank P Cammisa Jr, MD; **Alexander P Hughes, MD***
- 11:41 am - 11:43 am Presentation #80
Therapeutic Impact Of Grafted Oligodendrogenic-Neural Progenitor Cells Combined With Sustained Delivery Of Chondroitinase Abc Using An Innovative Methylcellulose Biomaterial For Chronic Spinal Cord Injury
***Satoshi Nori, MD, PhD**; Mohamad Khazaei, PhD; Kazuya Yokota, MD, PhD; Jan-Eric Ahlfors; Shinsuke Shibata, MD, PhD; Morio Matsumoto, MD; Masaya Nakamura, MD; Molly Shoichet; Michael Fehlings, MD*
- 11:43 am - 11:53 am Discussion
- 11:54 am - 11:56 am Presentation #81
Establishing Maximal Medical Improvement Following Anterior Cervical Discectomy And Fusion
*Dil V Patel, BS; Joon Sung Yoo, BA; Benjamin Khechen, BA; Anirudh K Gowd; Eric H Lamoutte, BS; Sailee S Karmarkar, BS; Joseph Liu, MD; Kern Singh, MD; **Nathaniel W Jenkins, MS**; James M Parrish, MPH*
- 11:57 am - 11:59 am Presentation #82
Does Neurologic Diagnosis Affect Improvement In Neck Pain After Acdf Surgery?
***Justin Stull, MD**; Srikanth Divi, MD; John Mangan, MD, MHA; Dhruv K C Goyal, BA; Matthew Galetta, BA; Jeffrey A Rihn, MD; Mark F Kurd, MD; D Greg Anderson, MD; Barrett Ivory Woods, MD; Kristen E Radcliff, MD; Ian Kaye, MD; Alexander Vaccaro, MD, PhD, MBA; Christopher Kepler, MD; Gregory Douglas Schroeder, MD; Alan S Hilibrand, MBA, MD*
- 12:00 pm - 12:02 pm Presentation #83
Predictive Models For Long-Term Patient-Reported Outcomes After Cervical Spine Surgery For Myelopathy: A National Study Of 2717 Patients
***Inamullah Khan, MBBS**; Hui Nian, PhD; Frank E Harrell Jr, PhD; Jacquelyn S Pennings, PhD; Mohamad Bydon, MD; Anthony Asher; Kristin Archer, PhD; Clinton J Devin, MD*

- 12:03 pm - 12:05 pm Presentation #84
How Much Do Patients With Predominantly Neck Pain Improve After Acdf Surgery For Cervical Radiculopathy?
Srikanth N Divi, MD; Justin Stull, MD; John Mangan, MD, MHA; Dhruv K C Goyal, BA; Matthew Galetta, BA; Jeffrey A Rihn, MD; Mark F Kurd, MD; D Greg Anderson, MD; Barrett Ivory Woods, MD; Alan S Hilibrand, MBA, MD; Ian Kaye, MD; Alexander Vaccaro, MD, PhD, MBA; Christopher Kepler, MD; Gregory Douglas Schroeder, MD; Kristen E Radcliff, MD
- 12:06 pm - 12:08 pm Presentation #85
Functional Range Of Motion Of The Cervical Spine In Posterior Cervical Discectomy And Fusion Patients During Activities Of Daily Living
Sebastian Murati; Abenezer Alemu; Marcus Allen; Riffitts Michelle; Anna Bailes; Malcolm Dombrowski, MD; Joon Yung Lee, MD; William F Donaldson III, MD; William W Clark, PhD; Kevin Michael Bell, PhD
- 12:09 pm - 12:19 pm Discussion
- 12:20 pm - 12:22 pm Presentation #86
Which Topical Agent Is More Efficacious In Diminishing Postoperative Drainage Following Multi-Level Cervical Laminoplasty/Laminectomy: Tranexamic Acid- Versus Thrombin-Soaked Collagen Sponge?
Jiwon Park, MD; Haolin Zheng; Jin-Sup Yeom, MD, PhD; Jae Won Lee; Ho-Joong Kim, MD, PhD; Sang-Min Park; Bong-Soon Chang, MD, PhD; Choon-Ki Lee, MD, PhD
- 12:23 pm - 12:25 pm Presentation #87
Pseudoarthrosis Rates After Anterior Cervical Discectomy And Fusion (Acdf) Using Polyetheretherketone (Peek) Or Structural Allograft For Interbody Grafting: Minimum 2-Year Follow Up
Minghao Wang, MD, PhD; Dean Chou, MD; Chih-Chang Chang, MD; YILIN LIU, MD; Ankit Hirpara; Praveen V Mummaneni
- 12:26 pm - 12:28 pm Presentation #88
CTA In Addition To MRI May Not Be Necessary In Detecting Subaxial Vertebral Artery Anomalies In Anterior Cervical Spine Surgery
Ichiro Okano, MD; Stephan N Salzmann, MD; Colleen Rentenberger; Jennifer Shue, MS; Andrew A Sama, MD; Federico P Girardi, MD; Frank P Cammisa Jr, MD; Alexander P Hughes, MD

- 12:29 pm - 12:31 pm Presentation #89
Can Reinforcing Lateral Mass Screw With Multiple Points Of Fixation Improve Anchoring Performance And Reduce Screw Pullout?
Franck Le Naveaux, PhD; Bahe Hachem; Kevin Fun Lee, MS; Jean-Marc Mac-Thiong, MD; Hyun W Bae, MD; Christopher Ames, MD; Masashi Neo, MD, PhD; Julien Clin
- 12:32 pm - 12:34 pm Presentation #90
The Effect Of Arthrodesis On Neuroforaminal Area
Clarissa Levasseur, MS; Samuel William Pitcairn, BS; Jeremy Dewitt Shaw, MD, MS; William F Donaldson III, MD; Joon Yung Lee, MD; William Anderst, PhD
- 12:34 pm - 12:44 pm Discussion
- 12:45 pm - 12:46 pm **Closing Remarks**
Moderators: Gregory D Schroeder, MD and Justin S Smith, MD, PhD
- 12:47 pm - 12:48 pm **Adjourning Notices**
Rick Sasso, MD