CSRS 49th Annual Meeting Preliminary Scientific Program

Marriott Marquis, Atlanta, Georgia
Live-Virtual November 29-30, 2021
In-Person December 2-4, 2021
On-Demand December 6, 2021 – January 31, 2022

John Rhee, MD, President
Samuel Cho, MD & Steven Ludwig, MD, Annual Meeting Program Co-Chairs
Abstract Review Committee: Samuel K. Cho, MD; Steven C. Ludwig, MD; Alexander C. Ching, MD; Matthew W. Colman, MD; Clinton J. Devin, MD; Ben J. Garrido, MD; Regis W. Haid, MD, FAANS; Craig A. Kuhns, MD; Sergio A. Mendoza-Lattes, MD; Justin W. Miller, MD; Ahmad Nassr, MD; Daniel K. Park, MD; Jeffrey A. Rihn, MD; Carlo Santaguida, MD, FRCSC; Jason W. Savage, MD; Arjun S. Sebastian, MD, MSc; Brian W. Su, MD; Barrett I. Woods, MD; Elizabeth M. Yu, MD; John M. Rhee, MD
Session I: CSRS Asia Pacific - Cervical Deformity, Uncommon but Challenging Cases
Moderator(s): Yu Sun, MD

8:00am-8:02am  CSRS Welcome
John Rhee, MD
8:02am-8:05am  Introduction
Yu Sun, MD
8:05am-8:15am  Post-Infectious Deformity
Shanmuganathan Rajasekaran, MD
8:15am-8:25am  Neuromuscular Deformity
Kyung-Soo Suk, MD
8:25am-8:35am  Congenital Cervical Deformity
Feifei Zhou, MD
8:35am-8:45am  Dropped Head Syndrome
Hiroshi Miyamoto, MD
8:45am-9:00am  Discussion

Session II: CSRS Europe - A Great Case Due to the Right Decision
Moderator(s): Heiko Koller, MD, PhD

8:00am-8:02am  CSRS Welcome
John Rhee, MD
8:02am-8:05am  Introduction
Heiko Koller, MD, PhD
8:05am-8:12am  Case Presentation I
Tobias Pitzen, MD
8:12am-8:19am  Case Presentation II
Petr Vachata, MD
8:19am-8:26am  Case Presentation III
Jorg Klekamp, MD
8:26am-8:33am  Case Presentation IV
Dezso Jeszensky, MD
8:33am-8:40am  Case Presentation V
Luis Carelli, MD
8:40am-9:00am  Discussion
Session 1: Abstracts - Outcomes Pt. I

Moderator(s): S. Tim Yoon, MD, PhD; Ra’Kerry Rahman, MD

**7:10am-7:11am** Introduction
**7:11am-7:16am** Presentation #1
Impact of Depression Severity on Patient Reported Outcomes Following Multilevel Anterior Cervical Discectomy and Fusion
Presenting Author - Cara E. Geoghegan, BS; Conor P. Lynch, MS; Elliot DK. Cha, MS; Caroline N. Jadczak, BS; Shruthi Mohan, BS; Kern Singh, MD

**7:16am-7:21am** Presentation #2
No Difference in Clinical Outcomes When Instrumenting Across the Cervicothoracic Junction in Multilevel Posterior Cervical Fusion
Presenting Author - Brian A. Karamian, MD; Gregory R. Toci, BS; Jennifer Z. Mao, MBA; Jose A. Canseco, MD PhD; Jenna L. Mandel, BS; Shivangi Bhatt, BS; Daria Harlamova, BS; Jeremy Heinle, BA; Teleale F. Gebeleyhu, MD; Jefferey A. Rihn, MD; Mark F. Kurd, MD; Alan S. Hillibrand, MD; Christopher K. Kepler, MD; Alexander R. Vaccaro, MD, PhD, MBA; Gregory D. Schroeder, MD

**7:21am-7:26am** Presentation #3
Trends in 2 Year Outcomes of a Prospective Consecutively Enrolled Single-Center Adult Cervical Deformity Series: Optimal Realignment Correlates with Superior Outcomes
Lara Passfall, BS; Oscar Krol, BA; Nicholas A. Kummer, BS; Navraj Sagoo, BS; Bhaveen H. Kapadia, MD; Bassel G. Diebo, MD; Shaleen Vira, MD; Presenting Author - Peter G. Passias, MD

**7:26am-7:31am** Presentation #4
Is it better to stop at C2 or C3/4 in elective posterior cervical decompression and fusion?
Presenting Author - Scott L. Zuckerman, MD; Inam Khan, MD; Silky Chotai, MD; Byron F. Stephens, II, MD; Amir M. Abtahi, MD; Clint Devin, MD

**7:31am-7:36am** Presentation #5
Preoperative Diagnosis of a Mental Health Disorder is Associated with Increased Postoperative Rates of Dysphagia after Anterior Cervical Spine Surgery
Presenting Author - Athan G. Zavras, BA; Ali Z. Piracha, BS; Zakariah K. Siyaji, BS; Talha S. Qadri, BS; Arash J. Sayari, MD; Nicholas A. Shepard, MD; Sahil Sood, BS; Nour Saleh, BS; Mohammed Kazi, BS; Matthew W. Colman, MD

**7:36am-7:47am** Discussion
**7:47am-7:52am** Presentation #6
Which traditional functional outcome measures and their specific components are most affected by proper re-alignment and clinical improvement in Adult Cervical Deformity Surgery?
Oscar Krol, BA; Nicholas A. Kummer, BS; Lara Passfall, BS; Presenting Author - Peter G. Passias, MD
7:52am-7:57am  Presentation #7
**Long Term Associations Between Current Smoking Status and Outcome After Elective Cervical Spine Surgery**
*Presenting Author - Gordon Preston, DO; Seokchun Lim, MD; James D. Whaley, MD; Jad G. Khalil, MD; Victor Chang, MD*

7:57am-8:02am  Presentation #8
**Prediction of complications after anterior cervical spinal fusion: a machine learning-driven approach**
*Presenting Author - Akash A. Shah, MD; Sai K. Devana, MD; Changhee Lee, MS; Amador Bugarin, BS; Alexander Upfill-Brown, MD; Elizabeth L. Lord, MD; Arya N. Shamie, MD; Nelson F. Soo Hoo, MD; Don Y. Park, MD*

8:02am-8:07am  Presentation #9
**Social Media Posts pertaining to Anterior Cervical Discectomy and Fusion (ACDF) Surgery: A Cross-Sectional Analysis of Patient and Surgeon Perceptions**
*Presenting Author - Peter Swiatek, MD; Anastasios G. Roumeliotis, BS; Joseph A. Weiner, MD; Ashvita Ramesh, BS; Daniel J. Johnson, MD; Erik B. Gerlach, MD; Srikanth N. Divi, MD; Alpesh A. Patel, MD; Wellington K. Hsu, MD*

8:07am-8:12am  Presentation #10
**Comparison of Clinical and Radiographic Outcomes After C3 Laminoplasty versus C3 Laminectomy**
*Joshua Rivera, BA; Jeremy Guinn, BS, BA; Andrew K. Chan, MD; Alexa Semonche, MD; Xiao Tan, BA; Justin Lee; Burooj Mahmood; Alysha Jamieson, BS; Kamal Kolluri; Parishkrita Srivastava; Yasmine Mahmoudieh; Rafael Guizar, III; Jeremy Huang; Vivian P. Le, MPH; Praveen V. Mummmaneni, MD; Dean Chou, MD; Presenting Author - Lee A. Tan, MD*

8:12am-8:24am  Discussion

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8:24am-8:25am  Introduction

8:25am-8:30am  Global Perspectives - United States
*Rick Sasso, MD*

8:30am-8:35am  Global Perspectives - Europe
*Heiko Koller, MD, PhD*

8:35am-8:40am  Global Perspectives - Asia Pacific
*TBD*

8:40am-8:47am  Discussion

8:47am-8:53am  DEBATE - Is Telemedicine Here to Stay? Yes, It's Awesome
*W. Ryan Spiker, MD*

8:53am-8:59am  DEBATE - Is Telemedicine Here to Stay? No, It's Worthless
*Andrew Hecht, MD*

8:59am-9:05am  Discussion

9:05am-9:11am  Using the Telemedicine Platform - How to Perform a Virtual Cervical Physical Examination
*Gregory Schroeder, MD*

9:11am-9:17am  Using the Telemedicine Platform - How Telemedicine Improved My Ability to Care for Cervical Spine Patients
*Sheeraz Qureshi, MD, MBA*

9:17am-9:24am  Discussion
Session 2: Abstracts - Top Reviewed "Sweet Sixteen" Pt. I

Moderator(s): Louis Amorosa, MD

9:54am-9:55am
Introduction

9:55am-10:00am
Presentation #11

Cervical Disc Replacement for Radiculopathy versus Myeloradiculopathy. An MCID Analysis.

Presenting Author - Ram K. Alluri, MD; Avani Vaishnav, MBBS; Ahilan Sivaganesan, MD; Dimitra Melissaridou, MD; Ryan Lee, MBA; Hikari Urakawa, MD; Jung Mok, BS; Kosuke Sato, MD; Derek Colaizzo, BA; Marcel Dupont, BA; Todd J. Albert, MD; Russel C. Huang, MD; Evan D. Sheha, MD; Sheeraz Qureshi, MD, MBA

10:00am-10:05am
Presentation #12

The influence of timing of surgical decompression for acute spinal cord injury: a pooled analysis of individual patient data in 1,548 cases

Presenting Author - Jetan H. Badhiwala, MD PhD; Jefferson R. Wilson, MD PhD; Christopher D. Witwiw, MD MS; James S. Harrop, MD; Alexander R. Vaccaro, MD, PhD, MBA; Bizhan BA. Aarabi, MD; Robert G. Grossman, MD, MD; Fred H. Geisler, MD PhD; Michael G. Fehlings, MD, PhD

10:05am-10:10am
Presentation #13

Comparison of Clinical Guidelines for Reimbursement for Intra-Operative Neuromonitoring During Spine Surgery in the United States

Presenting Author - Daniel Berman, MD; Nathaniel L. Tindel, MD; Ari J. Holtzman, MD

10:10am-10:15am
Presentation #14

Posterior Cervical Spinal Fusion Assemblies Intended to Cross the Cervicothoracic Junction: A Mechanical Analysis

John T. Sherrill, Ph.D.; Presenting Author - David B. Bumpass, M.D.; Erin M. Mannen, Ph.D.

10:15am-10:20am
Presentation #15

Comparative effectiveness of surgical approaches for cervical myelopathy: quality of life assessments from the CSM-S trial

Presenting Author - Zoher Ghogawala, MD, FACS; Melissa R. Dunbar, MPH; Janis L. Breeze, MPH; Adam S. Kanter, MD; Praveen V. Mummaneni, MD, MBA; Erica F. Bisson, MD; James S. Harrop, MD; Subu N. Magge, MD; Robert F. Heary, MD; Michael P. Steinmetz, MD; Michael G. Fehlings, MD PhD; Todd J. Albert, MD; Paul M. Arnold, MD; K. Daniel Riew, MD; Marjorie C. Wang, MD, MPH; Robert G. Whitmore, MD; John G. Heller, MD; Fred G. Barker, II, MD; Edward C. Benzel, MD

10:20am-10:34am
Discussion

10:34am-10:39am
Presentation #16

Cervical Total Disc Replacement: Available Implant Size Matters

Presenting Author - Richard D. Guyer, MD; Domagoj Coric, MD; Pierce D. Nunley, MD; Donna D. Ohnmeiss, MD

10:39am-10:44am
Presentation #17

Simulated Bundled Payments for Four Common Surgical Approaches to Treat Cervical Spondylotic Myelopathy: A Consideration to Break the Clinical Equipoise

Presenting Author - Nikhil Jain, MD; Mayur Sharma, MD; Dengzhi Wang, MS; Beatrice Ugiliweneza, PhD, MSPH;
Doniel Drazin, MD; Maxwell Boakye, MD, MPH, MBA, FACS

10:44am-10:49am Presentation #18
Do Inflammatory Cytokines Affect Patient Outcomes after ACDF?
Presenting Author - Brian A. Karamian, MD; Dessislava Z. Markova, PhD; Hannah A. Levy, BS; Payton M. Boere, BS; Goutham R. Yalla, BS; Taolin Fang, MD, PhD; Paul W. Millhouse, MD; Mayan Lendner, BS; Alan S. Hilibrand, MD; Christopher K. Kepler, MD MBA, MD; Alexander R. Vaccaro, MD, PhD, MBA; Gregory D. Schroeder, MD

10:49am-10:54am Presentation #19
Discharge to Rehabilitation Predicts Greater Morbidity in Patients Undergoing Posterior Cervical Decompression and Fusion
Presenting Author - Austen D. Katz, MD; Sohrab Virk, MD; Jeff Silber, MD; David A. Essig, MD

10:54am-11:05am Presentation #20
Cervical Laminectomy with Instrumented Fusion is Associated with a Higher Incidence of Postoperative C5 Palsy Compared to Cervical Laminoplasty with Reconstruction: Single Surgeon and National Inpatient Sample Analyses
Presenting Author - Jinseong Kim, BS; Dhruv S. Shankar, BS; Dennis M. Bienstock, BS; Michael Gao, BSE; Yunsoo Lee, MD; Saad B. Chaudhary, MD; Wesley H. Bronson, MD; Andrew C. Hecht, MD

11:05am-11:18am Discussion

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Thursday 12/2/2021

In-Person 1:05pm-2:05pm EST & On-Demand Dec. 6, 2021-Jan. 31, 2022

Symposia 2: Pearls of Wisdom for a Successful Research Study
Moderator(s): Wellington Hsu, MD; Zoher Ghogawala, MD, FACS

1:05pm-1:07pm Introduction
1:07pm-1:14pm Designing Research Questions - Study Considerations Leading to Success or Failure
Wellington Hsu, MD

1:14pm-1:21pm Knowing How and When to Pivot in a Research Project
Zoher Ghogawala, MD, FACS

1:21pm-1:28pm Clinical Trials - Organization and Getting the Message Out to the Right People
Michael G. Fehlings, MD, PhD, FRCSC, FACS

1:28pm-1:33pm Lessons Learned from Past and Current CSRS-Funded Studies - C12 Fusion vs. Bracing
Christopher Kepler, MD

1:33pm-1:38pm Lessons Learned from Past and Current CSRS-Funded Studies - 5-yr ASD Incidence After TDA Study
Pierce Nunley, MD

1:38pm-1:43pm Lessons Learned from Past and Current CSRS-Funded Studies - Steroids for Dysphagia
Sanford Emery, MD, MBA

1:43pm-2:05pm Discussion
Henry H. Bohlman Presidential Guest Lecture

2:05pm-2:10pm  Introduction
   John Rhee, MD

2:10pm-3:10pm  Henry H. Bohlman Presidential Guest Lecture
   Jeff Foxworthy

Thursday  12/2/2021

In-Person  3:40pm-4:56pm EST
& On-Demand  Dec. 6, 2021-Jan. 31, 2022

Session 3: Abstracts - Deformity; Diagnostics and Imaging; Biologics and Bone Graft
Moderator(s): Elizabeth Yu, MD

3:40pm-3:41pm  Introduction
3:41pm-3:46pm  Presentation #21
   Understanding the Effects of Three-Column Osteotomies on Regional and Global Alignment in patients with Moderate to Severe Cervical Deformity
   Presenting Author - Rushikesh S. Joshi, BS; Darryl Lau, MD; Alexander F. Haddad, BS; Vedat Deviren, MD; Christopher P. Ames, MD

3:46pm-3:51pm  Presentation #22
   Proximal and Distal Reciprocal Changes Following Cervical Deformity Malignment Correction
   Presenting Author - Renaud Lafage, MS; Justin S. Smith, MD, PhD; Themistocles S. Protopsaltis, MD; Eric Klineberg, MD; Gregory M. Mundis, Jr, MD; Peter G. Passias, MD; Jonathan Elysee, BS; Munish C. Gupta, MD; Christopher I. Shaffrey, MD; Han Jo Kim, MD; Shay Bess, MD; Frank J. Schwab, MD; Christopher P. Ames, MD; Virginie C. Lafage, PhD; ISSG International Spine Study Group

3:51pm-3:56pm  Presentation #23
   When Does the Construct Need to Extend to the Thoracic Spine in Patients Undergoing Correction for Cervical Deformity?
   Presenting Author - Peter G. Passias, MD; Lara Passfall, BS; Oscar Krol, BA; Nicholas A. Kummer, BS; Bhaveen H. Kapadia, MD; Shaleen Vira, MD; Renaud Lafage, MS; Bassel G. Diebo, MD; Virginie C. Lafage, PhD

3:56pm-4:01pm  Presentation #24
   Durability and Failure Mechanisms of Cervical Deformity Correction Surgery
   Eaman Balouch, MD PhD; Presenting Author - Themistocles S. Protopsaltis, MD; Zoe Norris, BS; Robert K. Eastlack, MD; Justin S. Smith, MD, PhD; D Kojo Hamilton, MD; Alan H. Daniels, MD; Eric O. Klineberg, MD; Peter G. Passias, MD; Robert A. Hart, MD; Shay Bess, MD; Christopher I. Shaffrey, MD; Frank J. Schwab, MD; Virginie C. Lafage, PhD; Christopher P. Ames, MD

4:01pm-4:06pm  Presentation #25
   Identifying T1 Slope Thresholds for Optimal Functional and Clinical Outcomes in Cervical Deformity Correction
   Lara Passfall, BS; Oscar Krol, BA; Nicholas A. Kummer, BS; Presenting Author - Peter G. Passias, MD

4:06pm-4:18pm  Discussion

4:18pm-4:23pm  Presentation #26
   Comparison of MRI-based Vertebral Bone Quality (VBQ) Score with Bone Mineral Density Measured by
Quantitative Computer Tomography (QCT) in Patients undergoing Cervical Spinal Surgery
Presenting Author - Lisa Oezel, MD; Ichiro IO. Okano, MD, MD; Stephan Salzmann, MD; Conor Jones, Student; Jennifer Shue, MS; Manuel Moser, MD; Dominik Adl Amini, MD; Erika A. Chiapparelli, MD; Andrew A. Sama, MD; John A. Carrino, MD; Frank P. Cammisa Jr, MD; Federico P. Girardi, MD; Alexander P. Hughes, MD

4:23pm-4:28pm  Presentation #27
Paraspinal Sarcopenia Predicts Worse Patient Reported Outcomes Following Posterior Cervical Fusion
Presenting Author - Zachariah Pinter, MD; Harold I. Salmons, IV, MD; Sarah Townsley, MD; Adan Omar, MD; Benjamin D. Elder, MD, Ph. D; Bradford Currier, MD; Brett A. Freedman, MD; Ahmad Nassr, MD; Scott C. Wagner, MD; Arjun S. Sebastian, MD, MSc

4:28pm-4:33pm  Presentation #28
What are the Post-operative Consequences of Intraoperative Neuromonitoring Changes during Cervical Spine Surgery
Presenting Author - Shalin Shah, DO; Amy Phan, BS; Addisu Mesfin, MD; Robert Molinari, MD; Emmanuel Menga, MD; Paul Rubery, MD; Won Park, BS

4:33pm-4:38pm  Presentation #29
Impact of inhalational anesthetic agents on the baseline monitorability of upper extremity motor evoked potentials (MEPs) during cervical spine surgery: A review 16,559 procedures.
Presenting Author - W. Bryan Wilent, PhD; Eric A. Tesdahl, PhD; Julie T. Trott, MS; Shakira A. Tassone, MS; James S. Harrop, MD; Eric O. Klineberg, MD; Anthony K. Sestokas, PhD

4:38pm-4:43pm  Presentation #30
Is the Use of rh-BMP associated with Increased Incidence of Cancer?
Presenting Author - Nida Fatima, MD; John H. Shin, MD; Junseok Bae, MD; Peter R. Loughenbury, MB ChB; KJ Murphy, MD; Amit Jain, MD; Zorica Buser, MD; Hans Joerg Meisel, MD; K. Daniel Riew, MD; AO Spine Knowledge Forum Degenerative

4:43pm-4:56pm  Discussion
CSRS 49TH ANNUAL MEETING PRELIMINARY SCIENTIFIC PROGRAM

**In-Person 7:00am-7:10am EST**

**Welcome**
Moderator(s): Samuel Cho, MD; Steven Ludwig, MD

**Session 4: Abstracts - Epidemiology, Etiology, and Natural History; Basic Science**
Moderator(s): Clinton Devin, MD; Erik Olsson, MD

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenting Author(s)</th>
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<tr>
<td>7:10am-7:11am</td>
<td>Introduction</td>
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<td>7:11am-7:16am</td>
<td>Presentation #31</td>
<td>Cervical Myelopathy and Hip Fractures: Co-occurrence, Epidemiology, and Costs of Care</td>
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<td><em>Presenting Author</em> - Hanci Zhang, MD; Thomas J. Buell, MD; Edward Baldwin, III, MD; Clifford Crutch, II, MD; Muhammad M. Abd-El-Barr, MD, PhD; C. Rory Goodwin, MD, PhD; Melissa Erickson, MD, MBA</td>
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<td>7:16am-7:21am</td>
<td>Presentation #32</td>
<td>Racial and social determinants of health disparities in patient presentation for cervical spine surgery: census tract level disparities reveal greater preoperative morbidity and worse POD 90 patient reported outcomes</td>
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<td><em>Presenting Author</em> - Sarthak Mohanty, B.S.; Jenna Harowitz, B.A.; David Casper, MD; Presenting Author - Comron Saifi, MD</td>
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<td>7:21am-7:26am</td>
<td>Presentation #33</td>
<td>No Difference in Reoperation Rates in Posterior Cervical Fusions Stopping at C7 versus T1/T2 for Adjacent Segment Disease (Operative ASD): A cohort of 875 Patients - Part 1</td>
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<td><em>Presenting Author</em> - Kern H. Guppy, MD, PhD; Presenting Author - Kathryn E. Royse, PhD; Jacob H. Fennessy, MD; Elizabeth P. Norheim, MD; Jessica E. Harris, MS; Harsimran S. Brara, MD</td>
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<td>7:26am-7:31am</td>
<td>Presentation #34</td>
<td>Physical Examination Findings of Patients With Myelopathy and Diabetes Mellitus.</td>
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<td><em>Presenting Author</em> - Mena G. Kerolus, MD; Scott L. Zuckerman, MD; Alex Ha, MD; Ian Buchanan, MD; Mark M. Herbert, BS; Meghana Vulapalli, MD; K. Daniel Riew, MD; Meghan Cerpa, MPH</td>
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<td>7:31am-7:36am</td>
<td>Presentation #35</td>
<td>Do Favorable Short-term Patient Reported Outcomes after ACDF Predict Loss to One- and Two-Year Follow-Up?</td>
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<td><em>Presenting Author</em> - Brian A. Karamian, MD; Hannah A. Levy, BS; Joshua D. Pezzulo, BS; Matthew Sherman, BS; Tyler D. Alexander, MS; Jose A. Canseco, MD; I. David Kaye, MD; Jeffrey A. Rihn, MD; Kris E. Radcliff, MD; Barrett I. Woods, MD; Mark F. Kurd, MD; Alan S. Hilibrand, MD; Christopher K. Kepler, MD MBA, MD; Alexander R. Vaccaro, MD, PhD, MBA; Gregory D. Schroeder, MD</td>
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<td>7:36am-7:41am</td>
<td>Presentation #36</td>
<td>The Impact of Social Determinants of Health (SDOH) on 30- and 90-Day Readmission Rates Following Spine Surgery</td>
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<td><em>Presenting Author</em> - Sarthak Mohanty, B.S.; David Casper, MD; Presenting Author - Comron Saifi, MD</td>
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7:52am-7:57am  Presentation #37
Safety Evaluation of Hydroxyapatite-Demineralized Bone Matrix Composite Scaffold for Spinal Fusion
Elianna Fred, BS; James P. Foley, MD; Eileen N. Phan, BA; Allison J. Wintring, BS; Andrew A. Furman, BA; Marcus S. Rossi, BS; Mark A. Plantz, BS, MD; Silvia Minardi, PhD; Adam E. Jakus, PhD; Ramille Shah, PhD; Stuart R. Stock, PhD; Presenting Author - Wellington K. Hsu, MD; Erin L. Hsu, PhD

8:12am-8:17am  Presentation #41
Chemical control of grafted human iPSC derived neurons demonstrated the contribution of graft neuronal activity to the recovery following spinal cord injury
Presenting Author - Takahiro Kitagawa, MD; Narihito Nagoshi, MD, PhD; Yasuhiro Kamata, MD, PhD; Morio Matsumoto, MD, PhD; Hideyuki Okano, MD, PhD; Masaya Nakamura, MD, PhD

7:57am-8:02am  Presentation #38
Computed Tomography Osteoabsorptiometry (CT-OAM) Evaluation of Subchondral Bone Mineral Density in Cervical Endplates and Uncovertebral Joints: Implications for Subsidence and Clinical Practice
Presenting Author - Athan G. Zavras, BA; Navya Dandu, BS; Alejandro A. Espinoza-Orias, PhD; Kern Singh, MD; Howard S. An, MD; Nozomu Inoue, MD, PhD; Matthew W. Colman, MD

8:07am-8:12am  Presentation #40
Long-term Selective Stimulation of Transplanted Neural Stem/Progenitor Cells for Spinal Cord Injury Improves Locomotor Function Mediated by Increased Synaptic Transmission
Presenting Author - Momotaro Kawai, MD; Narihito Nagoshi, MD, PhD; Kent Imaizumi, MD, PhD; Mitsuru Ishikawa, PhD; Shinsuke Shibata, MD, PhD; Munehisa Shinozaki, MD, PhD; Morio Matsumoto, MD, PhD; Hideyuki Okano, MD, PhD; Masaya Nakamura, MD, PhD

8:02am-8:07am  Presentation #39
Novel In Vivo Imaging System of Grafted Human iPS Cell-Derived Neuron Activity after Spinal Cord Injury
Presenting Author - Kentaro Ago, MD; Narihito Nagoshi, MD, PhD; Kent Imaizumi, MD, PhD; Shinsuke Shibata, MD, PhD; Morio Matsumoto, MD, PhD; Masaya Nakamura, MD, PhD; Hideyuki Okano, MD, PhD

8:17am-8:30am  Discussion

8:30am-9:41am EST & On-Demand Dec. 6, 2021-Jan. 31, 2022
Symposia 3: Deformity Consideration for the Everyday Cervical Degenerative Conditions
Moderator(s): Langston Holly, MD; Praveen Mummaneni, MD

8:30am-8:32am  Introduction
8:32am-8:42am  Patient with Myelopathy/Radiculopathy Doesn’t Have Perfect Alignment - Do They Really Need a Cervical Deformity Correction?
John Rhee, MD
8:42am-8:52am  How to Prevent Iatrogenic Deformity
Regis Haid, MD
8:52am-9:02am  Choice of UIV
Stuart Hershman, MD
9:02am-9:12am  Choice of LIV and When to Cross the CT Junction
Zachary Ray, MD
When Should I Include or Exclude an Adjacent Segment Disc
Andrew Dailey, MD, FAANS

Discussion

In-Person 10:11am-10:50am EST

Presidential Address
Moderator(s): John Rhee, MD

10:11am-10:20am Introduction
James Harrop, MD

10:20am-10:50am Presidential Address
John Rhee, MD

In-Person 10:50am-12:06am EST & On-Demand Dec. 6, 2021-Jan. 31, 2022

Session 5: Abstracts - Biomechanics; Complications
Moderator(s): P. Justin Tortolani, MD; Zeeshan Sardar, MD

10:50am-10:51am Introduction

10:51am-10:56am Presentation #42
Longitudinal Changes in Adjacent Segment Disc Deformation After Cervical Arthrodesis
Clarissa M. LeVasseur, MS; Anna Martinez, BS; Samuel Pitcairn, BS; Jeremy D. Shaw, MD; William F. Donaldson, III, MD; Joon Y. Lee, MD; Presenting Author - William J. Anderst, MD

10:56am-11:01am Presentation #43
Finite Element Modeling to Determine the Effect of a

Hybrid Construct Adjacent to a Cervical Disc Arthroplasty
Presenting Author - Jamie L. Baisden, MD; Yuvaraj Purushothaman, PhD; Hoon Choi, MD PhD; Narayan Yoganandan, PhD

11:01am-11:06am Presentation #44
In Vivo Deformation Patterns of Craniocervical Ligaments during Dynamic Head Axial Rotation
Chaochao Zhou, Ph.D.; Runsheng Guo, MD; Cong Wang, BS; Tsung-Yuan Tsai, Ph.D, MD; Wei Wang, MS; Guoan Li, Ph.D.; Presenting Author - Thomas Cha, MD

11:06am-11:11am Presentation #45
Supplemental Fixation of Lateral Mass Screws: A Strategy to Improve Posterior Cervical Fusion Fixation Strength
Presenting Author - Robert M. Havey, MS; Muturi G. Muriuki, PhD; Suguna Pappu, MD; Nader S. Dahdaleh, MD; Kenneth R. Blank, PhD; Sarah Brownhill, PhD; Benjamin Johnston, BS; Sean Selover, MS; Shawn L. Harris, MS; Robert Carruth, MS; Rina Britan, MS; Avinash G. Patwardhan, PhD

11:11am-11:16am Presentation #46
Biomechanical Analysis of 3-level ACDF Construct Using a Finite-element Cervical Spine Model
Presenting Author - Lee A. Tan, MD; Hoon Choi, MD PhD; Yuvaraj Purushothaman, PhD; Davidson D. Davidson, PhD; Aju Bosco, MD; Narayan Yoganandan, PhD

11:16am-11:21am Presentation #47
Adjacent Level Kinematics Following One- and Two-Level Anterior Cervical Disectomy and Fusion
Clarissa M. LeVasseur, MS; Samuel Pitcairn, BS; Jeremy D. Shaw, MD; William F. Donaldson, III, MD; Joon Y. Lee, MD; Presenting Author - William J. Anderst, MD
11:21am-11:26am Presentation #48
In Vivo Kinematics of the Head-Neck Complex during Dynamic Head Axial Rotation
Runsheng Guo, MD; Chaochao Zhou, Ph.D.; Cong Wang, BS; Tsung-Yuan Tsai, Ph.D., MD; Wei Wang, MS; Guoan Li, Ph.D.; Presenting Author - Thomas Cha, MD

11:26am-11:33am Discussion

11:33am-11:38am Presentation #49
Delayed Upper Aerodigestive Tract Perforation from Anterior Cervical Spine Hardware: Treatment and Swallowing Outcomes
Hannah G. Kay, BS; Benjamin Campbell, MD; Jean-Nicolas Gallant, MD; Presenting Author - Catherine R. Carlile, MD; Patty Wright, MD; Byron F. Stephens, II, MD; Sarah L. Rohde, MD

11:38am-11:43am Presentation #50
The Effect of Undercorrection on Distal Junctional Kyphosis in Adult Cervical Deformity Patients
Oscar Krol, BA; Nicholas A. Kummer, BS; Lara Passfall, BS; Presenting Author - Peter G. Passias, MD

11:43am-11:48am Presentation #51
Failure in Cervical Total Disc Arthroplasty: Single Institution Experience, Systematic Review of the Literature, and Proposal of a Novel TDA Failure Classification System
Presenting Author - Athan G. Zavras, BA; T. Barrett Sullivan, MD; Kern Singh, MD; Frank M. Phillips, MD; Matthew W. Colman, MD

11:48am-12:06pm Discussion
Session 7: Abstracts - Outcomes Pt. II

Moderator(s): Gurvinder Deol, MD

2:06pm-2:07pm  Introduction
2:07pm-2:12pm  Presentation #52
   Cervical Spine Research Society - Cervical Stiffness
   Disability Index (CSRS-CSDI): Validation of a Novel
   Scoring System Quantifying the Effect of Post-
   Arthrodesis Cervical Stiffness on Patient Quality of Life
   Presenting Author - Andrew S. Jack, MD, MSc, FRCSC;
   Rod J. Oskouian, MD; Jens R. Chapman, MD; Robert A.
   Hart, MD

2:12pm-2:17pm  Presentation #53
   Influence of preoperative smoking status on clinical
   outcomes of laminoplasty in patients with degenerative
   cervical myelopathy: a prospective study
   Presenting Author - Guoyan Liang, MD; Yunbing Chang,
   MD

2:17pm-2:22pm  Presentation #54
   Evaluating the paradigm shift from anterior cervical
decompression and fusion to posterior muscle-
preserving selective laminectomy - a single center study
of degenerative cervical myelopathy
   Presenting Author - Kazuya Kitamura, MD, PhD; Eddie de
   Dios, MD; Gergely Bodon, MD; Laszlo Barany, MD; Anna
   MacDowall, MD

2:22pm-2:27pm  Presentation #55
   Does diabetes affect the surgical outcomes in cases

2:27pm-2:32pm  Presentation #56
   Comparison of Laminoplasty and Posterior Fusion
   Surgery for Cervical Ossification of the Posterior
   Longitudinal Ligament: Data from a Prospective
   Multicenter Research Organization regarding
   Ossification of the Spinal Ligament
   Presenting Author - Hiroaki Nakashima, MD, PhD;
   Toshitaka T. Yoshii, MD, PhD; Satoru Egawa, MD, PhD;
   Masao Koda, MD, PhD; Takeo Furuya, MD, PhD; Atsushi
   Kimura, MD, PhD; Narihito Nagoshi, MD, PhD; Kenichiro
   Sakai, MD, PhD; Takashi Hirai, MD, PhD; Kei Ando, MD,
   PhD; Mario Matsumoto, MD, PhD; Atsushi Okawa, MD,
   PhD; Masashi Yamazaki, MD, PhD; Shiro Imagama, MD,
   PhD

2:32pm-2:37pm  Presentation #57
   Highest Achievable Outcomes for Patients Undergoing
   Cervical Deformity Corrective Surgery by Frailty
   Presenting Author - Peter G. Passias, MD; Nicholas A.
   Kummer, BS; Virginie C. Lafage, PhD; Renaud Lafage,
   MS; Alan H. Daniels, MD; Eric O. Klineberg, MD; Breton
   Line, BS; Robert A. Hart, MD; Douglas C. Burton, MD;
   Christopher I. Shaffrey, MD; Shay Bess, MD; Christopher
   P. Ames, MD

2:37pm-2:50pm  Discussion
2:50pm-2:55pm  Presentation #58  
**Surgical Apgar Score and Controlling Nutritional Status Score** are significant predictors of major complications after cervical spine surgery  
*Presenting Author - Kousei Miura, MD, PhD; Kosuke Sato, MD; Tomoyuki Asada, MD; Mamoru Kono, MD; Fumihiko Eto, MD; Yosuke Shibao, MD; Hiroshi Noguchi, MD, PhD; Hiroshi Takahashi, MD; Toru Funayama, MD, PhD; Masao Koda, MD, PhD; Masashi Yamazaki, MD, PhD*

3:15pm-3:28pm  Discussion

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2:55pm-3:00pm  Presentation #59  
**What is the fate of pseudarthrosis detected 2 years after anterior cervical disectomy and fusion? Results of a minimum of 5-years follow-up**  
*Dong-Ho Lee, MD, PhD; Jae Hwan Cho, MD, PhD; Sehan Park, MD; Presenting Author - Seung Hyun Baek, MD; Jun Hee Lee, MD; INHee Kim, MD; Seong Hun Song, MD*

3:00pm-3:05pm  Presentation #60  
**The associations between radiological and neurological findings of degenerative cervical myelopathy: Radiological analysis based on kinematic CT myelography and evoked potentials of spinal cord**  
*Presenting Author - Masahiro M. Funaba, MD; Yasuaki Imajo, MD; Hidenori Suzuki, MD; Norihiro Nishida, MD; Takuya Sakamoto, MD; Takashi Sakai, MD*

3:05pm-3:10pm  Presentation #61  
**Analysis of Clinical Deterioration Following Adult Cervical Deformity Realignment Surgery: Two Year Outcomes of a Consecutive, Prospectively Enrolled Database**  
*Lara Passfall, BS; Nicholas A. Kummer, BS; Oscar Krol, BA; Presenting Author - Peter G. Passias, MD*

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3:10pm-3:15pm  Presentation #62  
**Restored inhibitory signalling via AAV-mediated KCC2 upregulation recruits microglia to reorganize spinal neural circuits**  
*Presenting Author - Michael G. Fehlings, MD PhD; Mohammad-Masoud Zavvarian, BSc*

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3:52pm-5:00pm EST & On-Demand Dec. 6, 2021-Jan. 31, 2022  
**Symposia 4: Master Debate Series Pt. I**  
*Moderator(s): Darrel Brodke, MD*

3:52pm-3:54pm  Introduction

3:54pm-4:04pm  **DEBATE - 2-Level CDD with Myelopathy: ACDF**  
*K. Daniel Riew, MD*

4:04pm-4:14pm  **DEBATE - 2-Level CDD with Myelopathy: CDR**  
*Sanford Emery, MD*

4:14pm-4:27pm  Discussion

4:27pm-4:37pm  **DEBATE - 3-Level CDD: ACDF**  
*Vincent Traynelis, MD*

4:37pm-4:47pm  **DEBATE - 3-Level CDD: Hybrid Approach**  
*John Heller, MD*

4:47pm-5:00pm  Discussion
Welcome
Moderator(s): Samuel Cho, MD; Steven Ludwig, MD

Session 8: Abstracts - Top Reviewed "Sweet Sixteen" Pt. II
Moderator(s): Timothy Moore, MD; Chris Witiw, MD

8:10am-8:11am  Introduction
8:11am-8:16am  Presentation #63  Predictive Factors for the Aggravation of Cervical Alignment after Posterior Cervical Foraminotomy
                Presenting Author - Hyung Rae Lee, MD; Dong-Ho 1. Lee, MD Phd; Sang Yun Seok, MD; Jae Hwan Cho, MD, Phd; Sehan Park, MD
8:16am-8:21am  Presentation #64  Surgical Treatment of Single level Cervical Radiculopathy: A Comparison of Anterior Cervical Decompression and Fusion (ACDF) vs. Cervical Disc Arthroplasty (CDA) vs. Posterior Cervical Foraminotomy (PCF).
                Presenting Author - Kedar Padhye, MD; Paul A. Shultz, MD; Christopher Alcala, MD; John M. Dawson, PhD; Berit A. Swanberg, BA; Ensor E. Transfeldt, MD

8:21am-8:26am  Presentation #65  Surgical and Radiographic Outcomes in Patients with High T1 and C2 Slopes
                Zoe Norris, BS; Presenting Author - Themistocles S. Protopsaltis, MD; Eaman Balouch, MD PhD; Ethan W. Ayres, MD MPH; Alexandra Soroceanu, MD MPH; Renaud Lafage, MS; Justin S. Smith, MD, PhD; Eric O. Klineberg, MD; Peter G. Passias, MD; Robert A. Hart, MD; Shay Bess, MD; Christopher I. Shaffrey, MD; Frank J. Schwab, MD; Virginie C. Lafage, PhD; Christopher P. Ames, MD

8:26am-8:31am  Presentation #66  No Difference in Reoperation Rates in Posterior Cervical Fusions Stopping at C7 versus T1/T2 for Nonunions (Operative Nonunions): A cohort of 875 Patients - Part 2
                Jacob H. Fennessy, MD; Kern H. Guppy, MD, PhD; Presenting Author - Kathryn E. Royse, PhD; Elizabeth P. Norheim, MD; Jessica E. Harris, MS; Harsimran S. Brara, MD

8:31am-8:36am  Presentation #67  Racial Disparities in Patients Undergoing Anterior Cervical Discectomy and Fusion: A Multi-Site Study
                Thaddeus Woodard, B.S.; Brian Cortese, B.S.; Sachin Gupta, MD; Sarthak Mohanty, B.S.; David Casper, MD; Presenting Author - Comron Saifi, MD

8:36am-8:41am  Presentation #68  Stand-Alone Cages versus Cage and Plate Constructs for Primary One- and Two-level Anterior Cervical Discectomy and Fusion: A Prospective Randomized Controlled Trial
                Presenting Author - Athan G. Zavras, BA; Zakariah K. Siyaji, BS; Ali Z. Piracha, BS; Talha S. Qadri, BS; Michael T. Nitze, MD; Arash J. Sayari, MD; Kern Singh, MD; Matthew W. Colman, MD

8:41am-8:56am  Discussion
Session 9: CSRS Past Research Grant Presentations

Moderator(s): Wellington Hsu, MD

8:56am-9:02am  Introduction and Recognition of 2021 Research Grant Award Winners
Wellington Hsu, MD

9:02am-9:04am  2018 Medtronic Grant Award
Analysis of the Human Serum Proteome in Cervical Radiculopathy Patients to Predict Who Will Fail Conservative Treatment and Require Surgery
Emory Orthopaedics & Spine Center
Presenting Investigator: Andrew Pugley, MD

9:04am-9:06am  2018 21st Century Grant Award
New Approaches in Salamanders as Platforms for Uncovering Spinal Cord Regeneration Factors
Brigham & Women's Hospital, Department of Orthopaedic Surgery; Harvard Medical School
Presenting Investigator: Anirudh Gowd, MD

9:06am-9:08am  2018 Seed Starter Grant Award
Morphological, Biochemical and Biomechanical Characterization of Human Cervical Endplate in Degenerated Disc
Medical University of South Carolina, Charleston
Presenting Investigator: Ankit Mehta, MD

9:08am-9:10am  2018 Resident Fellow Grant Award
Evaluating the Influence of Impaired Cervical Cord Blood Perfusion on Clinical Severity of Cervical Myelopathy Using Intravoxel Incoherent Motion MRI
Emory Orthopaedics & Spine Center
Presenting Investigator: Wellington Hsu, PhD

9:10am-9:12am  2018 Seed Starter Grant Award
Is Vaporized Nicotine as Detrimental to Spinal Fusions as Cigarette Smoke?
Penn State Hershey Medical Center
Presenting Investigator: James Kang, MD

9:12am-9:14am  2019 21st Century Grant Award
Treatment of Spinal Cord Injury With Bone Marrow Mesenchymal Stem Cell Derived Exosomes
University of Illinois at Chicago College of Medicine, Department of Neurosurgery
Presenting Investigator: Jesse Bible, MD

9:14am-9:16am  2019 Seed Starter Grant Award
A Multi-Disciplinary Approach to Reduce Chronic Opioid Use Prior to Elective Cervical Spine Surgery
University of Iowa Hospitals and Clinics
Presenting Investigator: Jose Canseco, MD

9:16am-9:18am  2020 21st Century Grant Award
Quantitative Histomorphological Characterization of Human Cervical Nerve Roots to Determine the Relationship with Postoperative C5 Palsy
Department of Neurosurgery, Georgetown University Medical Center
Presenting Investigator: Michael Nolte, MD

9:18am-9:20am  2020 21st Century Grant Award
Exploring Prognostic Brain Biomarkers for Cervical Myelopathy: A Resting-State Functional MRI Multicenter Study
Osaka University
Presenting Investigator: P. Justin Tortolani, MD

9:20am-9:22am  2020 Seed Starter Grant Award
Randomized Trial of Opioid vs. Non-Opioid Postoperative Pain Regimens After Anterior Cervical Discectomy and Fusion
Vanderbilt University Medical Center
CSRS 49TH ANNUAL MEETING PRELIMINARY SCIENTIFIC PROGRAM

Presenting Investigator: Amir Abtahi, MD
9:22am-9:24am 2020 Seed Starter Grant Award
3D Printed 2D Piezoelectric Materials to Deliver Stem Cells for Bone Repair and Regeneration
Northwestern University Feinberg School of Medicine
Presenting Investigator: Shuo Niu, MD

9:24am-9:26am 2020 Resident Fellow Grant Award
Radiographic Evaluation of the Cervical Neck Surgical Approach and Its Relationship with BMI and Operative Characteristics Following ACDF.
Rush University Medical Center
Presenting Investigator: Steven Pressciutti, MD

9:26am-9:28am 2020 Resident Fellow Grant Award
Prediction of Admission Costs Following Anterior Cervical Discectomy and Fusion Utilizing Machine Learning
Wake Forest University Baptist Medical Center
Presenting Investigator: Takashi Kaito, MD PhD

9:28am-9:30am 2020 Resident Fellow Grant Award
The Role of Calcitonin Gene-Related Peptide in Intervertebral Disc Neurogenic Inflammation: A Potential Therapeutic Target for Discogenic Pain
Jefferson University, Rothman Institute
Presenting Investigator: Yongren Wu, MD

In-Person 9:31am-9:41am EST
Presidential Farewell & Induction of New President

9:31am-9:36am Passing of the Medallion
John Rhee, MD

9:37am-9:41am Induction of New President
James Harrop, MD

In-Person 9:56am-10:56am EST & On-Demand Dec. 6, 2021-Jan. 31, 2022
Symposia 5: Master Debate Series Pt. II
Moderator(s): Michael Daubs, MD; Chris Shaffrey, MD

9:56am-9:58am Introduction

9:58am-10:07am DEBATE - Traumatic Cervical Facet Fractures without Dislocation: I fix them
Erica Bisson, MD

10:07am-10:16am DEBATE - Traumatic Cervical Facet Fractures without Dislocation: I put them in a collar
Addisu Mesfin, MD

10:16am-10:27am Discussion

10:27am-10:36am DEBATE - In an Awake, Alert, Cooperative Patient with a Cervical Dislocation: Closed Reduction Always and then OR
Jens Chapman, MD

10:36am-10:45am DEBATE - In an Awake, Alert, Cooperative Patient with a Cervical Dislocation: OR and Forget About the Closed

Updated August 2021
Reduction

Vincent Traynelis, MD

10:45am-10:56am Discussion

In-Person 10:56am-12:47pm EST & On-Demand Dec. 6, 2021-Jan. 31, 2022

Session 10: Abstracts - Motion Preservation; Trauma; Other

Moderator(s): Comron Saifi, MD

10:56am-10:57am Introduction

10:57am-11:02am Presentation #69

Single-level Cervical Disc Replacement Using a PEEK-on-Ceramic Implant: Results of a Multicenter FDA IDE Trial with 24-month Follow-up

Presenting Author - Richard D. Guyer, MD; Domagoj Coric, MD; Pierce D. Nunley, MD; Rick C. Sasso, MD; Michael J. Musacchio Jr, MD; Donna D. Ohnmeiss, MD

11:02am-11:07am Presentation #70

Range of Motion on Flexion and Extension at Long-Term Follow-Up After Cervical Total Disc Arthroplasty: A Systematic Review and Meta-Analysis

Presenting Author - Athan G. Zavras, BA; Zakariah K. Siyaji, BS; Navya Dandu, BS; Michael T. Nolte, MD; Arash J. Sayari, MD; T. Barrett Sullivan, MD; Matthew W. Colman, MD

11:07am-11:12am Presentation #71

Evaluation of Gait and Functional Stability in Preoperative Cervical Spondylotic Myelopathy Patients

Presenting Author - Pramod N. Kamalapathy, BA; Joshua E. Bell, MD; Evan A. Dooley, BS; Varun Puvaneswarajah, MD; Lawal Labaran, MD; Shawn Russell, PhD; Hamid Hassanzadeh, MD

11:12am-11:17am Presentation #72

Skip laminoplasty as a novel posterior decompression technique to decrease interlaminar fusion and preserve cervical range of motion

Dong-Ho Lee, MD.Phd; Jae Hwan Cho, MD, Phd; Sehan Park, MD; Presenting Author - Jun Hee Lee, MD; Seung Hyun Baek, MD; INHee Kim, MD; Seong Hun Song, MD

11:17am-11:22am Presentation #73

Neuroimaging Biomarkers Correlate With Disease Severity In Degenerative Cervical Myelopathy

Presenting Author - Muhammad Ali Akbar, MD; Allan R. Martin, MD PhD; Jetan H. Badhiwala, MD PhD; Sukhvinder Kalsi-Ryan, PhD; Julien Cohen-Adad, PhD; Jefferson R. Wilson, MD PhD; Michael G. Fehlings, MD PhD

11:22am-11:27am Presentation #74

Early Surgical Decompression Enhances Motor Recovery in Traumatic Cervical ASIA A Spinal Cord Injury Patients: Analysis of Prospective, Multicentre Data in 420 Cases

Presenting Author - Ali Moghaddamjou, MD; Jefferson R. Wilson, MD PhD; Michael G. Fehlings, MD PhD

11:27am-11:37am Discussion

11:37am-11:42am Presentation #75

Internet Video-Based Patient Education on ACDF and CTDR: A Quantitative Analysis of Content and Quality

Presenting Author - Edward DelSole, MD; Matthew Parry, BS; Amolie K. Kropp Lopez, BS; Luis Devia, BS; J. Alexander Holbert, MD

11:42am-11:47am Presentation #76

Risk Factors for MCID Drop-Off in Patients Undergoing Anterior Cervical Discectomy and Fusion

Presenting Author - Conor P. Lynch, MS; Elliot DK. Cha, MS; Caroline N. Jadczak, BS; Shruthi Mohan, BS; Cara E. Geoghegan, BS; Kern Singh, MD
11:47am-11:52am Presentation #77

Incidence of Noncontiguous Cervical Injury in Patients with Thoracic Spine Fractures
Presenting Author - Patrick Curtin, MD; Benjamin Mitchell, MD; Jay Patel, BA; Jenna Lansbury, BA; Michael P. Stauff, MD

11:52am-11:57am Presentation #78

International Validation of the AO Spine Subaxial Injury Classification System: The Importance of Methodology
Presenting Author - Brian A. Karamian, MD; Gregory D. Schroeder, MD; Rishi Kanna, MS; Andrei F. Joaquim, MD PhD; Emiliano Vialle, MD; Jose A. Canseco, MD; Jens R. Chapman, MD; Frank Kandziora, MD PhD; Shanmuganathan Rajasekaran, PhD; Marcel Dvorak, MD; Lorin M. Benneker, MD; AO Spine Subaxial Validation Group; Klaus Schnake, MD; F. Cumhur Oner, MD PhD; Christopher K. Kepler, MD MBA, MD; Alexander R. Vaccaro, MD, PhD, MBA

11:57am-12:02am Presentation #79

Survival Rates in Atlanto-occipital Dissociation: A Look at the Past 20 Years
Presenting Author - Gautham Prabhakar, MD; Galen Mills, MD; Abdullah Ghali, BS; David Momtaz, BS, MPH; Christopher Chaput, MD

12:02am-12:12am Discussion

12:12am-12:17am Presentation #80

Radiological factors associated with the severity of corticospinal tract dysfunctions for cervical spondylotic myelopathy: An analysis of the central motor conduction time and kinematic CT myelography
Presenting Author - Masahiro M. Funaba, MD; Yasuaki Imajo, MD; Hidenori Suzuki, MD; Norihiro Nishida, MD; Takuya Sakamoto, MD; Takashi Sakai, MD

12:17am-12:22am Presentation #81

Enoxaparin promotes functional recovery after spinal cord injury by antagonizing PTPR sigma
Presenting Author - Sadayuki Ito, MD; Kei Ando, MD, PhD; Kazuyoshi Kobayashi, MD, PhD; Hiroaki Nakashima, MD, PhD; Masaaki Machino, MD; Shiro Imagama, MD, PhD

12:22am-12:27am Presentation #82

Surgical outcome of cervical and thoracic extramedurally spinal tumor
Presenting Author - Akinobu Suzuki, MD; Hidetomi Terai, MD, PhD; Shinji Takahashi, MD, PhD; Koji Tamai, MD, PhD; Hiroaki Nakamura, MD

12:27am-12:32am Presentation #83

Laminectomy Alone versus Laminectomy with Fusion for Degenerative Cervical Myelopathy - a Long-term Study of a National Cohort
Presenting Author - Eddie de Dios, MD; Robert F. Heary, MD; Lars Lindhagen, PhD; Anna MacDowall, MD

12:32am-12:37am Presentation #84

The impact of anterior spondylolisthesis and kyphotic alignment on dynamic changes in spinal cord compression and neurological status in cervical spondylotic myelopathy: A radiological analysis involving kinematic CT myelography and multi-modal spinal cor
Presenting Author - Masahiro M. Funaba, MD; Takuya Sakamoto, MD; Yasuaki Imajo, MD; Hidenori Suzuki, MD; Norihiro Nishida, MD; Takashi Sakai, MD

12:37am-12:47am Discussion
Close of Meeting
Moderator(s): Samuel Cho, MD; Steven Ludwig, MD

E-Posters

E-Poster #1
Automated detection of cervical spinal cord compression and the reliability of morphometric parameters extracted with the Spinal Cord Toolbox
Magda MH. Horáková, MD; Tomáš TH. Horák, MD; Jan JV. Valošek, MSc; Tomáš TR. Rohan, MD; Eva Koritáková, PhD; Jan JK. Kocica, MD; Tomáš Skutil, MD; Zdenek ZK. Kadanka, MD; Petr Bednarik, MD; Alena AS. Svátková, MD; Josef JB. Bednarik, MD

E-Poster #2
Impact of cervical alignment for prognosis of cervical spondylotic amyotrophy - Propensity score matching analysis
Masahito Takahashi, MD, PhD; Masaaki Tsuji, MD; Kazuhiko Satomi, MD, PhD; Hideto Sano, MD, PhD; Takumi TT. Takeuchi, MD, PhD; Shoichi Ichimura, MD, PhD; Naobumi Hosogane, MD, PhD

E-Poster #3
What is the Ideal Cervical Spine Realignment in Operative Cervical Deformity Patients When the Thoracolumbar Spine is Not Addressed?
Lara Passfall, BS; Oscar Krol, BA; Nicholas A. Kummer, BS; Bhaveen H. Kapadia, MD; Shaleen Vira, MD; Bassel G. Diebo, MD; Peter G. Passias, MD

E-Poster #4
The Effect of Thoracic Kyphosis on Distal Junctional Kyphosis in Adult Cervical Deformity patients
Oscar Krol, BA; Lara Passfall, BS; Nicholas A. Kummer, BS; Peter G. Passias, MD

E-Poster #5
Modified Kappa-line correlates better with neurological outcomes than modified K-line after laminoplasty for cervical myelopathy caused by ossification of the posterior longitudinal ligament
Dong-Ho 1. Lee, MD,Phd; Jae Hwan Cho, MD, Phd; Sehan Park, MD; Seong Hun Song, MD; Seung Hyun Baek, MD; Jun Hee Lee, MD; INHee Kim, MD

E-Poster #6
Anterior Cervical Discectomy and Fusion V. Cervical Disc Replacement for Cervical Spondylotic Myelopathy. An MCID Comparison
Ram K. Alluri, MD; Avani Vaishnav, MBBS; Ahilan Sivaganesan, MD; Ryan Lee, MBA; Hikari Urakawa, MD; Jung Mok, BS; Kosuke Sato, MD; Marcel Dupont, BA; Derek Colaizzo, BA; Todd J. Albert, MD; Russel C. Huang, MD; Evan D. Sheha, MD; Sheeraz Qureshi, MD, MBA

E-Poster #7
Does Recall Bias Exist in Cervical Spine Surgery Patients As Reported Through PROMIS Questionnaires?
Nicholas C. Arpey, MD; Joshua E. Barrett, BA; Erik B. Gerlach, MD; Michael T. Peabody, BS; Allison M. Morgan, BA; Srikanth N. Divi, MD; Wellington K. Hsu, MD; Alpesh A. Patel, MD

E-Poster #8
Rethinking the Jefferson Fracture
E-Poster #9  
Michael Balas, MD(C); Michael G. Fehlings, MD PhD; Jefferson R. Wilson, MD PhD; Christopher D. Witiw, MD, MS

E-Poster #10  
Surgical Outcomes in Non-ambulatory Patients with Degenerative Cervical Myelopathy  
Blake A. Boehm, BS; Innocent Njoku, MD; Christopher G. Furey, MD

E-Poster #11  
Choose Wisely—ACDF and Cervical Disc Arthroplasty in the Outpatient Setting  
Bayard C. Carlson, MD; Eduardo C. Beauchamp, MD; Eiman Shafa, MD; Benjamin Mueller, MD; James Schwender, MD; Amir A. Mehbod, MD; Kevin J. Mullaney, MD; Joseph H. Perra, MD; Ensor E. Transfeldt, MD; Christopher Alcala, MD; John M. Dawson, PhD; Berit A. Swanberg, BA; Timothy A. Garvey, MD, MD

E-Poster #12  
Meeting Preoperative Expectations Predicts Patient Satisfaction following Anterior Cervical Discectomy and Fusion  
Elliot DK. Cha, MS; Conor P. Lynch, MS; Shruthi Mohan, BS; Cara E. Geoghegan, BS; Caroline N. Jadczak, BS; Kern Singh, MD

E-Poster #13  
Preoperative Sleep Difficulty Predicts Clinically Significant Improvement Following ACDF  
Elliot DK. Cha, MS; Conor P. Lynch, MS; Shruthi Mohan, BS; Cara E. Geoghegan, BS; Caroline N. Jadczak, BS; Kern Singh, MD

E-Poster #14  
Use of Multimodal Analgesic Protocol for Management of Postoperative Pain Following Cervical Laminoplasty: Clinical Case Series  
Elliot DK. Cha, MS; Conor P. Lynch, MS; Caroline N. Jadczak, BS; Shruthi Mohan, BS; Cara E. Geoghegan, BS; Kern Singh, MD

E-Poster #15  
Cervical Myelopathy With Severe Neck Pain: Is Anterior Or Posterior Approach Better?  
Andrew K. Chan, MD; Christopher I. Shaffrey, MD; Oren N. Gottfried, MD; Khoi D. Than, MD; Erica F. Bisson, MD; Anthony L. Asher, MD; Avery L. Buchholz, MD; Mohamad Bydon, MD; Domagoj Coric, MD; Kevin T. Foley, MD; Kail-Ming Fu, MD; John Knightly, MD; Paul Park, MD; Eric Potts, MD; Mark Shaffrey, MD; Luis M. Tumialan, MD; Jay Turner, MD; Cheerag D. Upadhyaya, MD; Michael Y. Wang, MD; Praveen V. Mummaneni, MD

E-Poster #16  
Three-dimensional reduction method with a modified C2 isthmus screw in irreducible atlantoaxial dislocation: a technical note  
Sheng-yuan Zhou, MD; Bo Yuan, MD; Yi-fan Tang, MD; Xiong-sheng Chen, MD

E-Poster #17  
Measurement of cervical range of motion by Comprehensive Musculoskeletal Analysis System: Repeatability and reliability analysis  
Huajiang Chen, MD; Fazhi Zang, MD; Jianxi Wang, MD; Bo Hu, MD
E-Poster #18  
**Periprosthetic bone loss after artificial cervical disc replacement: a radiographic study**  
Huajiang Chen, MD; Bo Hu, MD; Fazhi Zang, MD; Jianxi Wang, MD

E-Poster #19  
**Risk factors of subaxial intervertebral disorder after occipitocervical or atlantoaxial fusions in rheumatoid arthritis**  
Yusuke Chiba, MD, PhD.; Hideki Murakami, MD, PhD.; Hirooki Endo, MD, PhD.; Daisuke Yamabe, MD, PhD.; Ryosuke Oikawa, MD, PhD.; Hirotaka Yan, MD; Minoru Doita, MD, PhD.

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