Thursday, December 2, 2021
On-Demand: December 6, 2021 – January 31, 2022

President John M. Rhee, MD

Scientific Program Co-Chairs: Samuel K. Cho, MD • Steven C. Ludwig, MD

Abstract Review Committee: 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

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.

No electronic devices of any kind may be used to record any portion of the Instrucional Course, Annual Meeting Scientific Program, E-Posters, Industry Workshops, or Technical Exhibits.
Thursday 12/2/2021

6:30am-8:30am  Atrium Lobby

Breakfast

6:30am-6:30pm  Atrium Lobby

Registration Open

7:00am-8:24am  Atrium A

Session 1: Abstracts - Outcomes Pt. I  
Moderator(s): S. Tim Yoon, MD, PhD; Ra’Kerry Rahman, MD

7:00am-7:10am  
CSRS Welcome  
Program Co-Chairs, Samuel K. Cho, MD; Steven C. Ludwig, MD

7:10am-7:11am  
Introduction  
S. Tim Yoon, MD, PhD; Ra’Kerry Rahman, MD

7:11am-7:16am  
PRESENTATION #1  
Impact of Depression Severity on Patient Reported Outcomes Following Multilevel Anterior Cervical Discectomy and Fusion  
Elliot DK. Cha, MS

7:16am-7:21am  
PRESENTATION #2  
No Difference in Clinical Outcomes When Instrumenting Across the Cervicothoracic Junction in Multilevel Posterior Cervical Fusion  
Gregory R. Toci, BS

7:21am-7:26am  
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  
Eddie de Dios, MD

7:26am-7:31am  
PRESENTATION #4  
Is it better to stop at C2 or C3/4 in elective posterior cervical decompression and fusion?  
Scott L. Zuckerman, MD

7:31am-7:36am  
PRESENTATION #58  
Surgical Apgar Score and Controlling Nutritional Status Score are significant predictors of major complications after cervical spine surgery  
Kousei Miura, MD, PhD

7:36am-7:47am  
Discussion

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Thursday, continued

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?
Peter G. Passias, MD

7:52am-7:57am PRESENTATION #55
Does diabetes affect the surgical outcomes in cases with cervical ossification of the posterior longitudinal ligament?
Momotaro Kawai, MD

7:57am-8:02am PRESENTATION #8
Prediction of complications after anterior cervical spinal fusion: a machine learning-driven approach
Akash A. Shah, 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
Peter Swiatek, MD

8:07am-8:12am PRESENTATION #10
Comparison of Clinical and Radiographic Outcomes After C3 Laminoplasty versus C3 Laminectomy
Lee A. Tan, MD

8:12am-8:24am Discussion

SYMPHONY™ OCT SYSTEM
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48% increased pullout strength*1

“The SYMPHONY™ OCT System is not recommended for non-spinal use and deformed vertebrae. The SYMPHONY™ OCT System is a surgical system designed to facilitate the re-alignment of cervical deformity. Please refer to the instructions for use for a complete list of indications, contraindications, warnings and precautions. The SYMPHONY™ OCT System is not recommended for osteoporosis and relatively contraindicated for osteopenia. The SYMPHONY™ OCT System is contraindicated for osteoporosis and relatively contraindicated for osteopenia. The SYMPHONY™ OCT System is contraindicated for osteoporosis and relatively contraindicated for osteopenia. The SYMPHONY™ OCT System is contraindicated for osteoporosis and relatively contraindicated for osteopenia.

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Symposia 1: Digital Transformation During the Pandemic: How Did COVID-19 Change the Practice of Cervical Spine Surgery?
Moderator(s): Neill Wright, MD; Alpesh Patel, MD, MBA

8:24am-8:25am Introduction
Neill Wright, MD; Alpesh Patel, MD, MBA

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
Yoon Ha, MD, PhD

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

9:15am-6:30pm Exhibit Hall Open

9:24am-9:54am Coffee Break
**Session 2: Abstracts - Top Reviewed “Sweet Sixteen” Pt. I**

*Moderator(s): Louis Amorosa, MD; Daniel Sciubba, MD*

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Presenter(s)</th>
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</thead>
<tbody>
<tr>
<td>9:54am-9:55am</td>
<td><strong>Introduction</strong></td>
<td>Louis Amorosa, MD; Daniel Sciubba, MD</td>
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<td>9:55am-10:00am</td>
<td><strong>PRESENTATION #11</strong> Cervical Disc Replacement for Radiculopathy versus Myeloradiculopathy. An MCID Analysis.</td>
<td>Ram K. Alluri, MD</td>
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<td>10:00am-10:05am</td>
<td><strong>FIRST PLACE RESIDENT/FELLOW RESEARCH AWARD</strong> 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</td>
<td>Jetan H. Badhiwala, MD, PhD</td>
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<td>10:05am-10:10am</td>
<td><strong>THIRD PLACE RESIDENT/FELLOW RESEARCH AWARD</strong> PRESENTATION #13 Comparison of Clinical Guidelines for Reimbursement for Intra-Operative Neuromonitoring During Spine Surgery in the United States</td>
<td>Daniel Berman, MD</td>
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<td>10:10am-10:15am</td>
<td><strong>FIRST PLACE BASIC SCIENCE AWARD</strong> PRESENTATION #14 Posterior Cervical Spinal Fusion Assemblies Intended to Cross the Cervicothoracic Junction: A Mechanical Analysis</td>
<td>David B. Bumpass, MD</td>
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<td>10:15am-10:20am</td>
<td><strong>PRESENTATION #15</strong> Comparative effectiveness of surgical approaches for cervical myelopathy: quality of life assessments from the CSM-S trial</td>
<td>Zoher Ghogawala, MD, FACS</td>
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<td>10:20am-10:34am</td>
<td><strong>Discussion</strong></td>
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<td>10:34am-10:39am</td>
<td><strong>THIRD PLACE BASIC SCIENCE AWARD</strong> PRESENTATION #16 Cervical Total Disc Replacement: Available Implant Size Matters</td>
<td>Richard D. Guyer, MD</td>
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Thursday, continued

10:39am-10:44am  🎬 SECOND PLACE RESIDENT/FELLOW RESEARCH AWARD PRESENTATION #17
Simulated Bundled Payments for Four Common Surgical Approaches to Treat Cervical Spondylotic Myelopathy: A Consideration to Break the Clinical Equipoise
Nikhil Jain, MD

10:44am-10:49am  🎬 SECOND PLACE BASIC SCIENCE AWARD PRESENTATION #18
Do Inflammatory Cytokines Affect Patient Outcomes after ACDF?
Brian A. Karamian, MD

10:49am-10:54am  PRESENTATION #19
Discharge to Rehabilitation Predicts Greater Morbidity in Patients Undergoing Posterior Cervical Decompression and Fusion
Austen D. Katz, 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
Jinseong Kim, BS

11:05am-11:18am  Discussion
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
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<tr>
<td>11:30am</td>
<td>Industry Lunch Workshops</td>
<td>*Lunch workshops are limited to 40 attendees per room.</td>
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<td>ATEC Complex Cervical Decision Making</td>
<td>Dan Cavanaugh, MD; Alpesh Patel, MD; Tim Yoon, MD</td>
<td>A701</td>
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<td></td>
<td>DePuy Synthes Innovations in Lateral Mass Fixation to Address Complex Cervical Deformity</td>
<td>Christopher Ames, MD</td>
<td>A707</td>
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<td>Kuros Biosciences The first investigational drug-biologic candidate to be evaluated for spinal fusion (Fibrin-PTH) and an evidence-based review of bone grafts</td>
<td>Cesar Silva, MD, Clinical Study Director, Kuros Biosciences; Katherine Sage, MD, Director of Scientific Affairs, Kuros Biosciences</td>
<td>A702</td>
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<td>Medtronic Intelligence-based medicine: how big data, analytics and patient-specific implants are changing cervical spine surgery</td>
<td>Lee Tan, MD; Peter Passias, MD; Christopher Kleck, MD</td>
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<td>NuVasive Seeing is knowing: How visualization is advancing anterior cervical surgery</td>
<td>Rick Sasso, MD; Charles Crawford, MD; Jack Zigler, MD, FACS</td>
<td>A706</td>
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<td>Stryker 360 View of the Cervical Spine</td>
<td>Griffin Baum, MD; Erica Bisson, MD; Scott Parker, MD</td>
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<td>Zimmer Biomet Minimizing Complications in Cervical Arthroplasty Procedures</td>
<td>Neill Wright, MD</td>
<td>A703</td>
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</table>
1:05pm-2:05pm  📹  Atrium A

**Symposia 2: Pearls of Wisdom for a Successful Research Study**

*Moderator(s): Zoher Ghogawala, MD, FACS; Wellington Hsu, MD*

1:05pm-1:07pm  **Introduction**  
Zoher Ghogawala, MD, FACS; Wellington Hsu, MD

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**

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**The most clinically effective cervical total disc replacement (cTDR)**

*Simplify Cervical Disc* is the cTDR with the highest overall success rate at one and two levels.*

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*Data on file. Based on review of publicly available materials at the time of production.

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2:05pm–3:10pm

A trium A

This event will not be recorded.

12th Annual Henry H. Bohlman Presidential Guest Lecture - Jeff Foxworthy, Comedian

Laugh along with comedy-genius Jeff Foxworthy as he shares life advice and rip-roaring stories at the CSRS 49th Annual Meeting.

Jeff Foxworthy is one of the most respected and successful comedians in the country. He is the largest selling comedy-recording artist in history, a multiple Grammy Award nominee and best selling author of more than 26 books. In 2014, he was inducted into the Georgia Music Hall of Fame. Widely known for his redneck jokes, his act goes well beyond that to explore the humor in everyday family interactions and human nature, a style that has been compared to Mark Twain’s.

Jeff is currently on his new comedy tour “The Good Old Days,” which features all new material. This unforgettable night of comedy kicks off in Bowler, WI and includes a stop in his hometown at The Fox Theater in Atlanta where he will film a comedy special. We are excited to welcome him for the CSRS 49th Annual Meeting in his hometown!

Henry H. Bohlman, MD

Henry H. Bohlman, MD was a pioneer of modern cervical spine surgery and a founding member of CSRS. He served as President in 1989.

In addition to being a leader, he was a teacher and a mentor to more than 120 Fellows and Residents, many of whom have established their own Fellowships as well as significant academic careers. He trained more CSRS Presidents than anyone in the history of the Society.

Given his influence on our organization, CSRS leadership established a guest lectureship in his name in 2010.

3:10pm–3:40pm

A trium BC

Coffee Break

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3:40pm-4:56pm  Atrium A

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

3:40pm-3:41pm  Introduction
Elizabeth Yu, MD; Barrett Woods, MD

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
Rushikesh S. Joshi, BS

3:46pm-3:51pm  PRESENTATION #22
Proximal and Distal Reciprocal Changes Following Cervical Deformity Malalignment Correction
Renaud Lafage, MS

3:51pm-3:56pm  PRESENTATION #23
When Does the Construct Need to Extend to the Thoracic Spine in Patients Undergoing Correction for Cervical Deformity?
Virginie C. Lafage, PhD

3:56pm-4:01pm  PRESENTATION #24
Durability and Failure Mechanisms of Cervical Deformity Correction Surgery
Themistocles S. Protopsaltis, MD

4:01pm-4:06pm  PRESENTATION #25
Identifying T1 Slope Thresholds for Optimal Functional and Clinical Outcomes in Cervical Deformity Correction
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
Manuel Moser, MD

4:23pm-4:28pm  PRESENTATION #27
Paraspinal Sarcopenia Predicts Worse Patient Reported Outcomes Following Posterior Cervical Fusion
Zachariah Pinter, MD

4:28pm-4:33pm  PRESENTATION #28
What are the Post-operative Consequences of Intraoperative Neuromonitoring Changes during Cervical Spine Surgery
Shalin Shah, DO

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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  
W. Bryan Wilent, PhD

4:38pm-4:43pm  PRESENTATION #30  
Is the Use of rh-BMP associated with Increased Incidence of Cancer?  
Nida Fatima, MD

4:43pm-4:56pm  Discussion

5:00pm-6:30pm  Atrium BC  
Reception for All Attendees

7:00pm-9:00pm  Industry Dinner Sponsored by NuVasive  
See details below.

Join us for an evening of intimate discussions during CSRS at one of the off-site dinner locations hosted by NuVasive

The future of cervical spine surgery

Surgeon moderators include: Dr. Reg Haid, Dr. Todd Albert, Dr. Michael Groff and Dr. Vincent Traynelis

Thursday, December 2, 2021
7:00 – 9:00 p.m.
Off-site restaurants and private dining rooms  
Locations near the Marriott Marquis, Atlanta

RSVP to: https://forms.gle/BcACytjX6zau4pn26 or email Natalie Norket at nnorket@nuvasive.com

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