Virtual Annual Meeting Program At-A-Glance



Live Instructional Course December 1-3, 2020 Live Annual Meeting December 9-12, 2020 On-Demand Instructional Course and Annual Meeting December 7, 2020-January 15, 2021

www.csrs.org



Rick C. Sasso, MD, President Michael Gerling, MD, Instructional Course Program Chair Michael D. Daubs, MD & Andrew Dailey, MD, FAANS, Annual Meeting Program Co-Chairs



Introducing the new ACP

Reimagine the ACDF procedure with the thinnest plate system on the market^{*} supported by a complete interbody portfolio, from advanced porous materials, traditional PEEK and allograft.

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Join us for a workshop with Regis Haid, M.D.; Christopher Shaffrey, M.D.; Todd Albert, M.D. and Rick Sasso, M.D.

Reimagine ACDF with the new ACP and Advanced Materials Science interbodies

Click **'industry workshops'** on the annual meeting virtual platform home page to view at any time.

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

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SCHEDULE OVERVIEW

SCHEDULE OVERVIEW

2020 Instructional Course Schedule for Live Programming	
Tuesday, December I	
4:00pm-6:35pm PST / 7:00pm-9:35pm EST	Scientific Program - Instructional Course
Wednesday, December 2	
4:00pm-6:35pm PST / 7:00pm-9:35pm EST	Scientific Program - Instructional Course
Thursday, December 3	
4:00pm-6:35pm PST / 7:00pm-9:35pm EST	Scientific Program - Instructional Course
2020 Annual Meeting Schedu	Ile for Live Programming
Wednesday, December 9	
3:00pm-4:00pm PST / 6:00pm-7:00pm EST	DePuy Synthes Industry Workshop*
4:00pm-6:42pm PST / 7:00pm-9:42pm EST	Scientific Program - Annual Meeting

Thursday, December 10

6:00am-8:00am PST / 9:00am-11:00am EST 3:30pm-4:00pm PST / 6:30pm-7:00pm EST 4:00pm-5:20pm PST / 7:00pm-8:20pm EST 5:20pm-5:35pm PST / 8:20pm-8:35pm EST

Friday, December 11

3:00pm-4:00pm PST / 6:00pm-7:00pm EST 4:00pm-5:00pm PST / 7:00pm-8:00pm EST

5:00pm-6:15pm PST / 8:00pm-9:15pm EST

Saturday, December 12

6:00am-8:35am PST / 9:00am-11:35am EST *Denotes Non-CME Session Scientific Program - Annual Meeting Members' Business Meeting Scientific Program - Annual Meeting CSRS Awards Session*

Medtronic Industry Workshop* Henry H. Bohlman Presidential Guest Lecture Peyton Manning* Scientific Session - Annual Meeting

Scientific Program - Annual Meeting

W CSRS On-Demand Sessions Available Dec. 7, 2020-Jan. 15, 2021

Reference the Abstract Book to see full On-Demand Abstract Presentations. These presentations will not be offered live, but are still available for CME on the Virtual Meeting Platform.

CSRS Research Grants Complications - Avoidance and Management Deformity Diagnostics/Imaging Other Focused Abstracts Basic Science Cost Effectiveness/Health Policy Epidemiology/Etiology/Natural History Outcomes E-Posters

On-Demand content for the Instructional Course will be available Dec. 7, 2020-Jan. 15, 2021. On-Demand content for the Annual Meeting will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

All times are listed in Pacific Standard Time (PST).

WELCOME TO THE CSRS 25TH INSTRUCTIONAL COURSE AND 48TH ANNUAL MEETING



CSRS President Rick C. Sasso, MD

Welcome to our first-ever virtual Annual Meeting and Instructional Course. These will be incredibly interactive and interesting forums despite not being able to meet in person due to the pandemic. I hope that you will enjoy both the live as well as the on-demand meeting content.

Our virtual educational offerings will begin on December 1 with the Instructional Course and run three consecutive evenings. A special thank you to Michael Gerling and his education committee that put together this exceptional program.

The Annual Meeting will kick off our live content on December 9. Michael Daubs and Andrew Dailey have put together an excellent program, which includes four interactive symposia: Sports: Cervical Spine Controversies, Safety in Cervical Spine Surgery, Value of Cervical Spine Surgery, and Statistics. New this

year, highlighted abstract sessions presented both live and on-demand. Do not miss the Henry H. Bohlman Presidential Guest Lecture featuring NFL great, Peyton Manning. I will do a live, interactive question and answer session that will only be available Live on Friday night. It is an evening not to be missed!

In additional to all of the live offerings, on-demand content is available anytime December 7-January 15, 2021. I hope that you will join us and take advantage of all that the meeting has to offer.

This CSRS annual meeting will be virtually the best ever!

Sincerely,

le Sau

Rick C. Sasso, MD

INTERNATIONAL CSRS

CSRS ASIA-PACIFIC



President: Kyung-Su Suk, MD **Meeting Information:** 11th Annual Meeting, March 25-27, 2021 – Seoul, Korea **Society Website:** https://csrs-ap-section.org/

CSRS EUROPE



President: Heiko Koller, MD

Meeting Information: 36th Annual Meeting, May 26-28, 2021 – Paris, France Society Website: https://csrs-europe.org/

ORIGINS OF THE SOCIETY



The Cervical Spine Research Society is an organization of individuals interested in clinical and research problems of the cervical spine. Its purpose is the exchange and development of ideas and philosophy regarding the diagnosis and treatment of cervical spine injury and disease.

The concept of a sub-specialty group devoted to the cervical spine was first considered in 1966. As interest in this area grew, a preliminary meeting

to consider the formation of such an organization was held in Las Vegas, Nevada, in February, 1973, during the annual meeting of the American Academy of Orthopaedic Surgeons.

Present at the meeting were Edward H. Simmons and Ian McNab of Toronto; Richard Rothman and Henry H. Sherk of Philadelphia; Lee H. Riley, Jr. of Baltimore; Alice L. Garrett of West Haverstraw, New York; and Bernard Jacobs and J. William Fielding of New York City.

The name "Cervical Spine Research Society" was agreed upon and annual meetings were planned. The first such meeting was held in New York City in November, 1973. Since that time, yearly meetings have taken place at various locations within the North American continent.

Since the primary purpose of the organization is to carry out research and develop and exchange information on the cervical spine, international participation has been encouraged.

To provide a wide range of interest, it was felt that the composition of the membership should reflect the varying specialties and disciplines dealing with the cervical spine; biomechanical engineering, neurology, neurosurgery, radiology, orthopaedic surgery, and others. Qualifications for membership were to include demonstration of continued interest in the cervical spine and its related structures.

The organization has developed projects and has continued to grow. Current members are encouraged to seek out individuals, with appropriate interests, for membership to ensure the Society's future.

J. William Fielding, MD

MISSION STATEMENT

The Cervical Spine Research Society is a multidisciplinary organization that provides a forum for the exchange of ideas and promotes clinical and basic science research of the cervical spine. The organization values collegial interaction and strong scientific principles.

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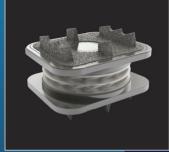


FOUNDED 1973

Cervical Spine Research Society 555 E Wells St. Suite 1100 Milwaukee, WI 53202 Phone: 414-918-9834 Fax: 414-276-3349 Email: info@csrs.org

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On the MOVE.

25 TWENTY-FIFTH ANNUAL INSTRUCTIONAL COURSE

OF THE



FOUNDED 1973

Live Sessions: December 1-3, 2020

On-Demand Content Available: December 7, 2020-January 15, 2021

President Rick Sasso, MD

Education Committee Chair Michael C. Gerling, MD

Education Committee Chrisopher P. Ames, MD • Paul M. Arnold, MD • Carlo Bellabara, MD Wayne K. Cheng, MD • Charles H. Crawford, MD • John C. France, MD Steven S. Hughes, MD • Brian K. Kwon, MD • Douglas G. Orndorff, MD Gregory D. Schroeder, MD • Neill M. Wright, MD

Course Objectives

- Review appropriate anatomy of the cervical spine.
- · Compare the methods for diagnosis of neck disorders.
- Evaluate operative and non-operative treatment options for cervical spine disorders.
- Recognize and respond to complications of surgical treatment.
- Exchange information on cervical spine research, diagnosis and treatment with both US and international surgeons.

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TUESDAY, DECEMBER I

Session 1. Spinal Cord and Column Injury & Cervical Degenerative - Avoiding latrogenic Cervical Deformities

🕐 Live Session Time: 4:00pm-6:35pm PST/7:00pm-9:35pm EST

Moderator(s): Michael Gerling, MD; Brian Kwon, MD, PhD, FRCSC; Gregory Schroeder, MD; Charles Crawford, MD, Steven Hughes, MD

4:00pm-4:05pm	Welcome Rick C. Sasso, MD; Michael Gerling, MD
	Cord and Column Injury on, MD, PhD, FRCSC; Gregory Schroeder, MD
4:05pm-4:07pm	Central Cord Injury In Stable, Degenerative Spine: Case Presentation Brian Kwon, MD, PhD, FRCSC
4:07pm-4:15pm	Central Cord Injury In Stable, Degenerative Spine: The Case for Delayed Surgery and 'Wait for the Cord To Cool Down' <i>James Harrop, MD, FAANS</i>
4:15pm-4:23pm	Central Cord Injury In Stable, Degenerative Spine: The Case for Early Surgery <i>Jefferson Wilson, MD</i>
4:23pm-4:28pm	Central Cord Injury In Stable, Degenerative Spine: Discussion and Live Q&A Brian Kwon, MD
4:28pm-4:30pm	Steroids and Other Neuroprotective Measures In Acute Cervical SCI: Case Presentation <i>Gregory Schroeder, MD, FACS</i>
4:30pm-4:38pm	Steroids and Other Neuroprotective Measures In Acute Cervical SCI: The Case for Avoiding Steroids <i>Alpesh Patel, MD, PhD, FRCSC, FACS</i>
4:38pm-4:46pm	Steroids and Other Neuroprotective Measures In Acute Cervical SCI: The Case for Giving Steroids <i>Michael Fehlings, MD</i>
4:46pm-4:48pm	Geriatric Odontoid Fracture: Case Presentation Gregory Schroeder, MD
4:48pm-4:53pm	Steroids and Other Neuroprotective Measures In Acute Cervical SCI: Discussion and <i>Lave</i> Q&A and Making Sense of the 2017 Aospine Guidelines <i>Brian Kwon, MD</i>

All times are listed in Pacific Standard Time (PST).

TUESDAY, DECEMBER I, continued

4:53pm-5:01pm	Geriatric Odontoid Fracture: The Case for Non-Operative Management <i>Timothy Moore, MD, PhD, FRCSC</i>
5:01pm-5:09pm	Geriatric Odontoid Fracture: The Case for Operative Management John Rhee, MD, PhD, FRCSC
5:09pm-5:15pm	Geriatric Odontoid Fracture: Discussion and Live Q&A and Master Technique Video <i>Gregory Schroeder, MD</i>
5:15pm-5:25pm	Break

Session 1B. Cervical Degenerative – Avoiding latrogenic Cervical Deformities *Moderator(s): Charles Crawford, MD; Steven Hughes, MD*

5:25pm-5:33pm	Anterior Fusion – ACDF & ACCF Christopher Shaffrey, MD
5:33pm-5:41pm	CDA K. Daniel Riew, MD
5:41pm-5:56pm	Panel Discussion and Live Q&A
5:56pm-6:04pm	Posterior Fusion Peter Passias, MD
6:04pm-6:12pm	Laminoplasty Jason Savage, MD
6:12pm-6:20pm	Posterior Disectomy Steven Hughes, MD
6:20pm-6:35pm	Panel Discussion and Live Q&A

On-Demand content for the Instructional Course will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

WEDNESDAY, DECEMBER 2

Session 2. Technology & Cervical Planning

Cive Session Time: 4:00pm-6:35pm PST/7:00pm-9:35pm EST

Moderator(s): Michael Gerling, MD; Wayne Cheng, MD; Christopher Ames, MD; and Carlo Bellabarba, MD

4:00pm-4:05pm Welcome Michael Gerling, MD

Session 2A. Technology

Moderator(s): Michael Gerling, MD, Wayne Cheng, MD

4:05pm-4:15pm	Cell Based Therapy - Stem Cell: Current Studies/Trials, Route Of Delivery, Survival in Harsh Microenvironment and the Outlook in the Near Future <i>Jeffrey Wang, MD</i>
4:15pm-4:25pm	Growth Factor Therapy - BMPS, PRP: Current Studies/Trials and Near Future Outlook; Scaffolds For Nucleus and Annulus - Now and Future <i>Zorica Buser, PhD</i>
4:25pm-4:35pm	Cell Based Allografts: The Science, Economics and Efficacy in Spine Surgery Brandon Lawrence, MD
4:35pm-4:45pm	Implant Technology: Advances in Material Properties, Surface and Structural Advances <i>Wellington Hsu, MD</i>
4:45pm-4:55pm	3D Printed Off-the-Shelf Implants: Titanium Alloy vs. Peek vs Silicon Nitride <i>Paul Anderson, MD</i>
4:55pm-5:05pm	Economic Update on Material Technology Ahmad Nassr, MD
5:05pm-5:15pm	Panel Discussion and Live Q&A
5:15pm-5:25pm	Break

WEDNESDAY, DECEMBER 2, continued

Session 2B. Surgical Planning

Moderator(s): Christopher Ames; Carlo Bellabarba

5:25pm-5:35pm	Radiographic Assessment of Cervical Deformity - Update on Measurement <i>Justin Smith, MD, PhD</i>
5:35pm-5:45pm	Cervical Deformity Classification for Treatment Planning Including Cluster Analysis <i>Han Jo Kim, MD</i>
5:45pm-5:55pm	Step by Step Planning for Rigid Deformity Including 3co and Custom Rods <i>Christopher Ames, MD</i>
5:55pm-6:05pm	Level Selection and DJK Themistocles Protopsaltis, MD
6:05pm-6:15pm	Deformity and Trauma Carlo Bellabarba, MD
6:15pm-6:35pm	Cases/Discussion and Live Q&A

On-Demand content for the Instructional Course will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

THURSDAY, DECEMBER 3

Session 3. Tumor and Infection & Complications

Cive Session Time: 4:00pm-6:35pm PST/7:00pm-9:35pm EST

Moderator(s): Michael Gerling, MD, Neill Wright, MD; John France, MD; Paul Arnold, MD, FAANS, FACS; Douglass Orndorff, MD

4:00pm-4:05pm Welcome Michael Gerling, MD

Session 3A. Tumor and Infection

Moderator(s): Neill Wright, MD; John France, MD

4:05pm-4:15pm	Tumor: Presentation, Workup, and Initial Management of Tumors in the Cervical Spine <i>Daniel Sciubba, MD</i>
4:15pm-4:25pm	Tumor: Update on Management of Metastatic Tumors to the Spine- Current Guidelines to Timing of Surgery/XRT, Surgery Selection <i>Jacob Buchowski, MD, MS</i>
4:25pm-4:35pm	Tumor: Dural Closure Techniques- Update on Method of Closure, Role of Sealants, to Place A Wound Drain Or Not <i>Kristen Radcliffe, MD</i>
4:35pm-4:45pm	Tumor: Intramedullary Tumor Resection Langston Holly, MD, FAANS
4:45pm-4:55pm	Infection: Role of Intrasite Antibiotic Therapy- Pros And Cons Ronald Lehman, MD
4:55pm-5:05pm	Infection: Management of Cervical Epidural Abscess- Indications for Surgery, Timing of Surgery, Medicolegal Considerations <i>Eric Nottmeier, MD</i>
5:05pm-5:15pm	Discussion and Live Q&A
5:15pm-5:25pm	Break

THURSDAY, DECEMBER 3, continued

Session 3B. Complications

Moderator(s): Paul Arnold, MD, FAANS, FACS, Douglas Orndorff, MD

5:25pm-5:33pm	Vertebral Artery Injury Andrew Dailey, MD, FAANS
5:33pm-5:41pm	Esophageal Injury Erica Bisson, MD, MPH
5:41pm-5:49pm	C5 Palsy Bruce Darden, MD
5:49pm-5:57pm	Junctional Complications/Issues Douglas Orndorff, MD
5:57pm-6:05pm	Complications Associated with the use of BMP Zoher Ghogawala, MD, FACS
6:05pm-6:13pm	Post-Operative Hematoma Carlo Santaguida, MD, FRCSC
6:13pm-6:35pm	Discussion and Live Q&A

On-Demand content for the Instructional Course will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

The Cervical Spine Research Society gratefully acknowledges

2020 CORPORATE SPONSORS

The continued success and increased impact of the Cervical Spine Research Society's research and education effort is dependent upon industry support.

Diamond Level (\$100,000+)



Silver Level (\$30,000-\$49,000)





Bronze Level (\$15,000-\$29,999)



2020 EXHIBIT COMPANIES

Visit the Annual Meeting and Instructional Course Exhibit Hall. Attendees can access the exhibit hall online on the Virtual Meeting Platform.

Medtronic	Patients are at the center of everything we do —and we believe medical technology can play an even greater role in improving people's lives. Join us in our commitment to take healthcare Further, Together. Be inspired at medtronic.com.
0 NUVASIVE	NuVasive (NASDAQ: NUVA) is the leader in spine technology innovation, with a mission to transform surgery, advance care and change lives. The Company's less invasive, procedurally integrated surgical solutions are designed to deliver reproducible and clinically proven outcomes. NuVasive is excited to introduce its new anterior cervical plating system, ACP.
DePuy Synthes	DePuy Synthes Companies, part of the Johnson & Johnson Medical Devices Companies, provides one of the most comprehensive orthopaedics portfolios in the world. DePuy Synthes solutions for shoulder, hip, knee, trauma, spinal surgery and sports medicine are designed to advance patient care while delivering clinical and economic value to health care systems worldwide.
stryker	Stryker is a global leader of complex spine and minimally invasive solutions focused on achieving three-dimensional Total Body Balance. Our spine business unit offers one of the most comprehensive and diverse product portfolios, including our leading 3D-printed technologies, enabling surgeons to provide their patients with treatment options.
ATEC Spine	ATEC is more than a medical technology company. We are an Organic Innovation Machine [™] that is focused on Revolutionizing the Approach to Spine Surgery. We are committed to creating clinical distinction by developing new approaches to treat the various pathologies to achieve the goals of spine surgery.
Centinel Spine	At CSRS, Centinel Spine will highlight its latest anterior column reconstruction technologies, as well as its recently announced partnership with one of the most winning professional athletes of all time, Tiger Woods.
Cerapedics	Cerapedics is an advanced orthobiologics company focused on developing its proprietary i-FACTOR [®] Peptide Enhanced Bone Graft powered by P-15: Osteogenic Cell Binding Peptide.
Zimmer Biomet	Zimmer Biomet Spine is a leader in restoring mobility, alleviating pain, and improving the quality of life for patients around the world by delivering surgeons a comprehensive portfolio of quality spine technologies and procedural innovation, best-in-class training, and unparalleled service via a network of responsive team members and sales professionals.

ANNUAL MEETING INDUSTRY WORKSHOPS

(*) Live with DePuy Synthes: Wednesday, Dec. 9, 3-4pm PST / 6-7pm EST

Complex Cervical Case Based Round Table Discussion Faculty: Christopher Ames, MD; John Shin, MD; Justin Smith, MD

On-Demand content for the Annual Meeting will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

Dec. 11, 3-4pm PST / 6-7pm EST

Prestige LP[™] Cervical Disc System – Design, Data, Differentiation *Faculty: Ron Lehman, MD and Rick Chua, MD*

On-Demand content for the Annual Meeting will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

On-Demand with NuVasive: Dec. 7-Jan. 15, 2021

Reimagine ACDF with the new ACP and Advanced Material Science interbodies *Faculty: Regis Haid, MD, Todd Albert, MD and Rick Sasso, MD*

All times are listed in Pacific Standard Time (PST).



No Strikeouts in Anterior Cervical Surgery Airway Management: QUICK REFERENCE GUIDE

ROUTINE OUTPATIENT POST-OPERATIVE ANTERIOR CERVICAL SURGERY CARE

Mandatory 4-hour post-operative observation

• Neurologic exam prior to discharge

Discharged only if the patient has the support of a competent adult overnight

Surgery center adherence to "No Strikeouts in Anterior Airway Management Protocol"

If concern for airway issues or post-operative hematoma the evaluating staff (Surgeon, Anesthesia, Nurse, PA) initiates "Initial Airway Assessment"

COMPONENTS OF "INITIAL AIRWAY ASSESSMENT"

- Staff notifies other staff members in proximity that airway assessment has been initiated
- Onsite anesthesia team is contacted and must evaluate the patient at bedside
- Surgeon is contacted and notified that airway assessment has been initiated
- Staff members in proximity bring the crash cart to the patient's bedside

Anesthesia team then decides based off evaluation if **No Strikeouts in Anterior Cervical Surgery Airway Management** is initiated

NO STRIKEOUTS IN ANTERIOR CERVICAL SURGERY AIRWAY MANAGEMENT



CSRS EDUCATIONAL RESOURCES

The streamlined safety protocol materials shown here are part of the CSRS Special Projects Committee's "Culture of Safety" focus for 2020.

This protocol is for all nurses, anesthesiologists, and spine surgeons who care for cervical spine patients after anterior procedures. It is a rational step-by-step algorithm to assess and treat the rare but potentially catastrophic postoperative complication of retropharyngeal hematoma. This coherent procedure aligns all of our medical staff in efficiently and effectively treating this problem-and will save lives. To view the No Strikeouts protocol video and to download the pocket reference guide and poster resources, click here.



FORTY-EIGHTH ANNUAL MEETING

OF THE



FOUNDED 1973

Live Sessions: December 9-12, 2020

On-Demand Content Available: December 7, 2020-January 15, 2021

President Rick Sasso, MD

Scientific Program Chairs Michael D. Daubs, MD • Andrew Dailey, MD, FAANS

Program Committee Samuel K. Cho, MD • Matthew W. Colman, MD
William F. Donaldson, III, MD • Ben J. Garrido, MD;Regis W. Haid, MD • Andrew C. Hecht, MD
Han-Jo Kim, MD • Craig A. Kuhns, MD • Brian K. Kwon, MD, PhD • Ronald A. Lehman, MD
Steven C. Ludwig, MD • Sergio A. Mendoza-Lattes, MD • Justin W. Miller, MD
Thomas E. Mroz, MD • Ahmad Nassr, MD • Themistocles Protopsaltis, MD
Jeffrey A. Rihn, MD • Carlo Santaguida, MD • Jason W. Savage, MD • Brian W. Su, MD
Eeric Truumees, MD • Barrett I. Woods, 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.

48th Annual Meeting Virtual Live Schedule Live Session Dates and Times

Annual Meeting *Live* Sessions are broadcasting via our Virtual Annual Meeting Platform December 9-12, 2020. To gain access, register by November 30, 2020 for the Annual Meeting.

On-Demand content for the Annual Meeting will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

All times are listed in Pacific Standard Time (PST).

WEDNESDAY, DECEMBER 9

① Live Session Time: 3:00pm-4:00pm PST / 6:00pm-7:00pm EST

DePuy Synthes Industry Workshop

Complex Cervical Case Based Round Table Discussion

Faculty: Christopher Ames, MD; John Shin, MD; Justin Smith, MD

🕑 Live Session Time: 4:00pm-4:10pm PST / 7:00pm-7:10pm EST

CSRS Annual Meeting Welcome

Moderator(s): Rick C. Sasso, MD; Michael Daubs, MD; Andrew Dailey, MD, FAANS

D Live Session Time: 4:10pm-5:27pm PST / 7:10pm-8:27pm EST

Symposia I: Using Big Data for Cervical Spine Magement

Moderator(s): Daniel Sciubba, MD

4:10pm-4:12pm	Introduction Daniel Sciubba, MD
4:12pm-4:27pm	Case Presentation Daniel Sciubba, MD
	Prospective, Multi-Center Studies: What Can We Collect And What Can
4:27pm-4:42pm	We Conclude?
	Zoher Ghogawala, MD, FACS
4:42pm-4:57pm	Predictive Alytics: We Cannot Tell The Future, But We Can Predict Better Than
	Christopher Ames, MD
4:57pm-5:12pm	Machine Learning And Spine: Is It Here Or Is It Hype? Joseph Schwab, MD
5:12pm-5:27pm	Discussion and Live Q&A

All times are listed in Pacific Standard Time (PST).

ANNUAL MEETING SCHEDULE

WEDNESDAY, DECEMBER 9, continued

Cive Session Time: 5:30pm-6:42pm PST / 8:30pm-9:42pm EST		
Highlighted Abstr		
. ,	ael Daubs, MD; Andrew Dailey, MD, FAANS	
5:30pm-5:32pm	Welcome Michael Daubs, MD; Andrew Dailey, MD, FAANS	
5:32pm-5:37pm	 FIRST PLACE - RESIDENT/FELLOW AWARD Presentation #1. Early versus (<24 hrs) Late (>=24 hrs) Surgical Decom Presentationsion for Central Cord Syndrome: A Propensity Score-Matched Alysis Michael G. Fehlings, MD, PhD, FRCSC; Jetan H. Badhiwala, MD; Jefferson R. Wilson, MD PhD; Christopher D. Witiw, MD, MS 	
5:37pm-5:42pm	 FIRST PLACE - CLINICAL RESEARCH AWARD Presentation #2. A randomized controlled multi-center trial comparing ventral and dorsal surgery for CSM: 2-year results Edward C. Benzel, MD; Zoher Ghogawala, MD, FACS; Adam S. Kanter, MD; Praveen V. Mummaneni, MD; Erica F. Bisson, MD; James S. Harrop, MD, FAANS; Robert F. Heary, MD; Michael P. Steinmetz, MD; Michael G. Fehlings, MD, PhD, FRCSC; Todd J. Albert, MD; Paul M. Arnold, MD; K. Daniel D. Riew, MD; Marjorie C. Wang, MD; John G. Heller, MD; Fred G. Barker, II, MD 	
5:42pm-5:47pm	© SECOND PLACE - RESIDENT/FELLOW AWARD Presentation #3. Does Screw Length for Primary Two-level ACDF Influence Pseudarthrosis Risk? Nathan J. Lee, MD; Paul Park, MD; Jun S. Kim, MD; Venkat Boddapati, MD; Justin Mathew, MD; Megha M. Vulapalli, BS; Louis F. Amorosa, MD; Zeeshan M. Sardar, MD; Rold A. Lehman, Jr., MD; K. Daniel Riew, MD	
5:47pm-5:52pm	😟 THIRD PLACE - BASIC SCIENCE AWARD	
	Presentation #4. Characterization of Basal and Cytokine Stimulated Biomarker Profiles of Degenerative Cervical and Lumbar Fusion Explants ex-vivo	
	Jacob S. Kramer, BS; Don K. Moore, MD; Naomi N. Lee, DVM, MS; Aaron M. Stoker, PhD, MS; Theodore J. Choma, MD; Muhammad Mirza, MD	
5:52pm-5:57pm	😟 THIRD PLACE - CLINICAL RESEARCH AWARD	
	Presentation #5. Cervical disc arthroplasty versus anterior cervical discectomy and fusion: 10-year outcomes of a prospective, randomized clinical trial at three sites.	
	<i>Pierce D. Nunley, MD; Michael Hisey, MD; Micah Smith, MD; Marcus B. Stone, PhD</i>	

All times are listed in Pacific Standard Time (PST).

WEDNESDAY, DECEMBER 9, continued

5:57pm-6:02pm	Presentation #6. Impact of Pre-operative Kyphosis on Outcomes of Cervical Disc Replacement Sheeraz Qureshi, MD, MBA; Avani Vaishnav, MBBS; Chirag Chaudhary, MBBS; Hikari Urakawa, MD; Kosuke Sato, MD; Ryan Lee, MBA; Jung Kee Mok, BS; Darren A. Chen, BS; Sravisht Iyer, MD; Steven McAny, MD; Todd J. Albert, MD
6:02pm-6:07pm	Presentation #7. Comparing Outcomes and Mortality of Upper Cervical and Subaxial Cervical Spine Trauma in Elderly Patients <i>Catherine R. Carlile, MD;</i> Andrew B. Rees, BS; Jacob D. Schultz, BS; Byron F. Stephens, II, MD
6:07pm-6:12pm	Presentation #8. Perioperative Outcomes of Concomitant Shoulder Diagnoses for Patients Undergoing Cervical Spine Procedures Peter G. Passias, MD; Waleed Ahmad, MS; Sara Naessig, BS; Katherine E. Pierce, BS; Frank A. Segreto, BS; Shaleen Vira, MD; Bassel Diebo, MD
6:12pm-6:17pm	© FIRST PLACE - BASIC SCIENCE AWARD Presentation #9. Efficacy of clinical hiPSC-OPC-enriched NS/PCs for transplantation in the subacute phase of spil cord injury Yasuhiro Kamata, MD; Miho Isoda, Ms.; Shuhei Ito, PhD; Morio Matsumoto, MD; Hideyuki Okano, MD; Masaya Nakamura, MD; Jun Kohyama, PhD; Narihito Nagoshi, MD
6:17pm-6:22pm	Presentation #10. Is it Safe to Stop at C7 During Multi-Level Posterior Cervical DecomPresentation sion and Fusion? - Multi-Center alysis <i>Eeric Truumees, MD;</i> Devender Singh, PhD; Devender Singh, PhD; William F. Lavelle, MD; Ron Riesenburger, MD; Matthew Geck, MD; Swamy Kurra, MD; Anthony J. Yu, MS; Daniel Grits, BS; Robert Winkelman, BS; Thomas Mroz, MD; John Stokes, MD
6:22pm-6:42pm	Discussion and Live Q&A

On-Demand content for the Annual Meeting will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

① Live Session Time: 6:00am-7:00am PST / 9:00am-10:00am EST

CSRS Asia Pacific Session: Surgical strategies for the myeolpathy caused by OPLL *Moderator(s): Kyung-Soo Suk, MD*

6:00am-6:12am	K-line (+) myelopathy: Anterior vs. Posterior Decompression <i>Gabriel Liu, MD</i>
6:12am-6:24am	K-line (-) myelopathy: Anterior decompression Dong-Ho Lee, MD
6:24am-6:36am	K-line (-) myelopathy: Posterior decompression + PF Masashi Koda, MD
6:36am-6:48am	K-line (-) myelopathy: Circumferential surgery Yu Sun, MD
6:48am-6:59am	Discussion

Time: 7:00am-8:00am PST / 9:00am-10:00am EST

CSRS Europe Session: The Cervical Cases That Influenced my Concepts and Strategy Moderator: Heiko Koller, MD

7:00am-7:05am	Introduction Heiko Koller, MD
7:05am-7:13am	Case 1 <i>David Choi, MD</i>
7:13am-7:21am	Case 2 Deszoe Jeszensky, MD
7:21am-7:29am	Case 3 Carmen L.A. Vleggeert-Lankamp, MD
7:29am-7:37am	Case 4 Jorg Klekamp, MD
7:37am-7:45am	Case 5 Petr Vachata, MD
7:45am-8:00am	Discussion and Live Q&A

(*) Live Session Time: 4:00pm-4:10pm PST / 7:00pm-7:10pm EST

Welcome

Moderator(s): Rick C. Sasso, MD; Michael Daubs, MD; Andrew Dailey, MD, FAANS

THURSDAY, DECEMBER 10, continued

() Live Session Time: 4:10pm-5:20pm PST / 7:10pm-8:20pm EST

Symposia II: Safety In Cervical Spine Surgery

Moderator(s): Todd Albert, MD

4:10pm-4:15pm	Introduction
	Todd Albert, MD
4:15pm-4:30pm	Prevention of Complications
	Steven Ludwig, MD
4:30pm-4:45pm	Safety in an Outpatient Setting: Which Cases and Nuances
	Sheeraz Qureshi, MD, MBA
4:45pm-5:00pm	Safety in Deformity and Myelopathy Surgery
	Han Jo Kim, MD
5:00pm-5:20pm	Discussion and Live Q&A

On-Demand content for the Annual Meeting, aside from the Awards Session which will be live only, will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

Decive Session Time: 5:20pm-5:35pm PST / 8:20pm-8:35pm EST

Awards Session: Frank J. Eismont, Lifetime Achievement Award Recipient; CSRS Research Grant Awards; and CSRS Abstract Awards

Moderator(s): Rick C. Sasso, MD

This session will only be offered live.



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Frank J. Eismont, MD

Live from the Virtual Meeting Platform*

Thursday, Dec. 10, 5:20pm-5:35pm PST / 8:20pm-8:35pm EST *This presentation is only available live.



CSRS proudly awards Dr. Frank J. Eismont as the first recipient of the Lifetime Achievement Award, marking his outstanding contributions to the field of cervical spine surgery throughout his career.

A member since 1981, Dr. Eismont was president of the society in 1995 and greatly influenced the course and direction of the CSRS. Dr. Eismont served on the executive committee from 1993-1996, as chairman of the editorial committee, and as local host for the Miami Annual Meeting in 1985. His colleagues mention him as one of the greatest educators of cervical spine disorders due to his tireless nature, his hands-on cervical spine courses for young

spine surgeons, and the way he enthusiastically continues educational efforts with humble and dedicated energy.

Dr. Eismont graduated from University of Rochester School of Medicine in 1973. He completed his residency at Cleveland-based Case Western Reserve University and followed his residency with a fellowship at Metrohealth Med Center in 1979 and Pennsylvania Hospital in 1980. Dr. Eismont is currently Chairman of the Department of Orthopaedics at the University of Miami Miller School of Medicine.

We applaud Dr. Eismont for his keen commitment and outstanding contributions to the CSRS and field of cervical spine research by honoring his with the CSRS Lifetime Achievement Award.

I ITH ANNUAL HENRY H. BOHLMAN PRESIDENTIAL GUEST LECTURE

Live from the Virtual Meeting Platform* Friday, Dec. 11, 2020 from 4-5pm PST/7-8pm EST *This presentation is only available live.

Peyton Manning



Hear NFL great Peyton Manning share the real world leadership advice he picked up on the football field as a two time Super Bowl Champion and five-time Most Valuable Player at the CSRS Virtual Annual Meeting in a Q&A style session with President Rick Sasso.

Legendary quarterback Peyton Manning, a 14-time Pro Bowl selection, has earned his place among the greatest quarterbacks in league history as one of the leaders in nearly every statistical passing category. During the 2015/2016 season, Manning led the Denver Broncos to a 24-10 win over the Carolina Panthers in Super Bowl 50, making him the first starting quarterback in NFL history to win a Super Bowl with two different teams.

Manning entered the NFL in 1998 with the Indianapolis Colts as the first overall draft pick. When he retired in 2016, Manning held numerous records including the most career touchdown passes in league history in addition to ranking first all-time in completions and passing yards. Named a first-team All-Pro selection by the Associated Press on seven occasions, no quarterback in NFL history had more playoff appearances or 300-yard passing games than Manning when he retired.

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. This year marks the eighth annual event with a presentation by Lynn I. Scheel, Colonel, US Air Force.

FRIDAY DECEMBER II

① Live Session Time: 3:00pm-4:00pm PST / 6:00pm-7:00pm EST

Medtronic Industry Workshop

Prestige LP[™] Cervical Disc System – Design, Data, Differentiation *Faculty: Ron Lehman, MD and Rick Chua, MD*

Cive Session Time: 4:00pm-5:00pm PST / 7:00pm-8:00pm EST

Henry H. Bohlman Presidential Guest Lecture - Peyton Manning Moderator(s): Rick C. Sasso, MD

This session will only be offered live.

(1) Live Session Time: 5:00pm-6:15pm PST / 8:00pm-9:15pm EST

Symposia III: Why We Can't All Agree: Sports-Related Debates of the Cervical Spine *Moderator(s): Wellington Hsu, MD*

5:00pm-5:05pm	Introduction Wellington Hsu, MD
5:05pm-5:10pm	Return to Play: 1-Level Cervical Pseudarthrosis, Yes Alexander Vaccaro, MD, PhD, MBA
5:10pm-5:15pm	Return to Play: 1-Level Cervical Pseudarthrosis, No Alpesh Patel, MD, FACS
5:15pm-5:22pm	Discussion and Live Q&A
5:22pm-5:27pm	RTP: 2-Level ACDF, Yes John Heller, MD
5:27pm-5:32pm	RTP: 2-Level ACDF, No Robert Watkins, III, MD
5:32pm-5:39pm	Discussion and Live Q&A
5:39pm-5:44pm	RTP: C1 Ring Anomaly, Yes Thomas Zdeblick, MD
5:44pm-5:49pm	RTP: C1 Ring Anomaly, No K. Daniel Riew, MD
5:49pm-5:56pm	Discussion and Live Q&A
5:56pm-6:01pm	RTP: Congenital Cervical Stenosis, No Andrew Hecht, MD
6:01pm-6:06pm	RTP: Congenital Cervical Stenosis, Yes Wellington Hsu, MD
6:06pm-6:15pm	Discussion and Live Q&A

On-Demand content for the Annual Meeting will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

SATURDAY, DECEMBER 12

Cive Session Time: 6:00am-7:12am PST / 9:00am-10:12am EST		
Highlighted Abstr	racts II	
	ael Daubs, MD; Andrew Dailey, MD, FAANS	
6:00am-6:02am	Welcome Michael Daubs, MD; Andrew Dailey, MD, FAANS	
6:02am-6:07am	😟 THIRD PLACE - RESIDENT/FELLOW AWARD	
	Presentation #11. Publicly Available Online Resources for ACDF are not Easily Read or Understood by the Average Patient <i>Christopher Lindsay, MD;</i> Mary K. Skalitzky, BA; Alan G. Shamrock, MD; Burke Gao, MD; Trevor R. Gulbrandsen, MD; Joshua Eisenberg, MD; Andrew Pugely, MD	
6:07am-6:12am	SECOND PLACE - BASIC SCIENCE AWARD	
	Presentation #12. ExPresentation sion alysis of susceptibility genes for ossification of the posterior longitudil ligament <i>Shuji Watabe, MD, PhD;</i> Hideaki Nakajima, MD, PhD; Kazuya KH. Honjoh, MD, PhD; Arisa Kubota, MD; Ai Takahashi, MD, PhD; Akihiko Matsumine, MD, PhD	
6:12am-6:17am	Presentation #13. Complex cervical spine surgery improves quality of life in the extremely elderly age group; results from an ambispective study of 582 patients over 75 years old from a single institution. <i>Jamie RF. Wilson, MD, FRCS; Jetan H. Badhiwala, MD; Hetshree Joshi,</i> <i>BA; Ali Moghaddamjou, MD; Raja Rampersaud, MD; Stephen J. Lewis, MD;</i> <i>Eric M. Massicotte, MD, FRCSC; Michael G. Fehlings, MD, PhD, FRCSC</i>	
6:17am-6:22am	Presentation #14. Concomitant foraminotomy for radiculomyelopathy is directly involved in postoperative upper limb palsy in cervical laminoplasty <i>Hiroyuki Ishiguro, MD, PhD;</i> Shota Takeka, MD, DMSc; Masafumi Kashii, MD, PhD; Yuichiro YU. Ukon, MD; Yukitaka Nagamoto, MD, PhD; Masayuki Furuya, MD, PhD; Takahiro TM. Makino, MD, DMSc; Yusuke Sakai, MD; Takashi Kaito, MD, PhD	
6:22am-6:27am	😟 SECOND PLACE - CLINICAL RESEARCH AWARD	
	Presentation #15. Intrathecal administration of recombint human hepatocyte growth factor for acute traumatic cervical spil cord injury: double-blinded, placebo-controlled and randomized phase I/II study. <i>Masaya Nakamura, MD; Kazuya Kitamura, MD, PhD; Narihito Nagoshi,</i> <i>MD; Osahiko Tsuji, MD; Kota Suda, MD, PhD; Takeshi Maeda, MD, PhD;</i> <i>Yoshiyuki Yato, MD, PhD; Daichika Hayata, PhD; Morio Matsumoto, MD;</i> <i>Hideyuki Okano, MD</i>	
6:27am-6:32am	Presentation #16. Pain catastrophizing impacts outcome scores but not recovery kinetics after 1-2 level anterior cervical surgery Sheeraz Qureshi, MD, MBA; Sohrab Virk, MD; Avani Vaishv, MBBS; Chirag Chaudhary, MBBS; Ryan Lee, MBA; Hikari Urakawa, MD; Kosuke Sato, MD; Jung Mok, BS; Darren A. Chen, BS; Steven McAny, MD; Sravisht Iyer, MD; Todd J. Albert, MD; Catherine Gang, MPH;	

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SATURDAY, DECEMBER 12, continued

6:32am-6:37am	Presentation #17. A Novel Method to Classify Cervical Incomplete Spil Cord Injury based on Potential for Recovery: A Group-Based Trajectory Alysis <i>Michael G. Fehlings, MD, PhD, FRCSC; Jetan H. Badhiwala, MD;</i> <i>Jefferson R. Wilson, MD PhD; Christopher D. Witiw, MD, MS</i>
6:37am-6:42am	Presentation #18. Does the Lowest Instrumented Vertebra (LIV) Level Predict Mechanical Failure in Posterior Cervical Fusion? Byron F. Stephens, II, MD; Joseph T. Labrum IV, IV, MD; Imullah Khan, MBBS; Kristin R. Archer, PhD; Amir M. Abtahi, MD
6:42am-6:47am	Presentation #19. Outcomes of Neurologic Complication and Utility of Intraoperative Neuromonitoring for Lower Cervical and Upper Thoracic Posterior Based Three Column Osteotomies for Cervical Deformity <i>Christopher Ames, MD; Darryl Lau, MD; Alexander F. Haddad, BS; Vedat</i> <i>Deviren, MD</i>
6:47am-6:52am	Presentation #20. Patient Specific Cervical Deformity Corrections with Consideration of Associated Risk: Establishment of Risk Benefit Thresholds for Invasiveness Based on Deformity and Frailty Severity Peter G. Passias, MD; Katherine E. Pierce, BS; Reud Lafage, MS; Virginie Lafage, PhD; Eric O. Klineberg, MD; Alan H. Daniels, MD; Themistocles Protopsaltis, MD; Richard Hostin, MD; Breton Line, BS; Douglas Burton, MD; Shay Bess, MD; Frank Schwab, MD; Christopher I. Shaffrey, MD; Justin S. Smith, MD; Christopher Ames, MD
6:52am-7:12am	Discussion and Live Q&A

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SATURDAY, DECEMBER 12, continued

Cive Session Time: 7:15am-8:35am PST / 10:15am-11:30am EST

Symposia IV: The Race to the Bottom: Why Governmental Bundled Payments/Risk Based Care has Failed for Cervical Spine Surgery

Moderator(s): Alexander Vaccaro, MD, PhD, MBA; Paul Slosar, MD

7:15am-7:17am	Introduction Alexander Vaccaro, MD, PhD, MBA; Paul Slosar, MD
7:17am-7:37am	Overview of CMS and Bundled Payment Program related to Spine Surgery: BPCI, BPCI-A <i>Vadim Goz, MD</i>
7:37am-7:52am	BPCI/BPCI-A: A Private Practice Success Story Paul Slosar, MD
7:52am-8:07am	Rothman Experience- Why BPCI/BPCI-A Doesn't Work for Spine Surgery <i>Kartik Shenoy, MD</i>
8:07am-8:30am	Discussion and Live Q&A
8:30am-8:35am	Close of Meeting Rick C. Sasso, MD

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CSRS On-Demand Sessions Available Dec. 7, 2020-Jan. 15, 2021

Reference the Abstract Book to see full On-Demand Abstract Presentations. These presentations will not be offered live, but are still available for CME on the Virtual Meeting Platform.

CSRS Research Grants	Basic Science
Complications - Avoidance and Management	Cost Effectiveness/Health Policy
Deformity Diagnostics/Imaging	Epidemiology/Etiology/Natural History
Other	Outcomes
Focused Abstracts	E-Posters

On-Demand content for the Instructional Course will be available Dec. 7, 2020-Jan. 15, 2021. On-Demand content for the Annual Meeting will be available on the Virtual Meeting Platform the day after it airs live through Jan. 15, 2021.

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FUTURE MEETINGS

Hands On Surgical Techniques

Course July 15-17, 2021 Indiana Spine Group, Indianapolis, Indiana

Future Instructional Courses

Dec. 1, 2021 Marriott Marquis, Atlanta, GA

Nov. 16, 2022 Manchester Grand Hyatt, San Diego, CA

Nov. 30, 2023 The Cosmopolitan of Las Vegas, NV

Future Annual Meetings

Dec. 2-4, 2021 Marriott Marquis, Atlanta, GA

Nov. 17-19, 2022 Manchester Grand Hyatt, San Diego, CA

Dec 1-3, 2023 The Cosmopolitan of Las Vegas, NV

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Evaluations

Please take time to complete the evaluations for each session you attend. Evaluations allow us to assess whether we have met your needs as a learner and what we can do to improve the next activity. After completing the evaluation surveys, CME and attendance certificates are generated.

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Some drugs and medical devices demonstrated during this course have limited FDA labeling and marketing clearance. It is the responsibility of the physician to be aware of drug or device FDA labeling and marketing status.

Abstract Volume

There were 527 abstract submissions during the 2020 Call for Abstracts. All accepted abstracts are available in the online virtual platform for live and/or on-demand viewing. This year, 98 abstracts were selected for podium presentations. Twenty of these abstracts will be highlighted during our live Annual Meeting Sessions from Dec. 9-12th. The remaining 78 abstracts will be available on-demand on our virtual meeting platform.

E-Posters

There are 50 E-Posters available for your review in the E-Poster section of the online virtual meeting platform.

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